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COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

COMMUNICATION FROM THE COMMISSION

'Horizon 2020 - The Framework Programme for Research and Innovation'

PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND THE COUNCIL

laying down the rules for the participation and dissemination in Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)

PROPOSAL FOR A COUNCIL REGULATION

on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

{COM(2011) 808 final}
{SEC(2011) 1428 final}

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INTRODUCTION

This impact assessment report is accompanying two Commission legislative proposals concerning the adoption of the rules for participation and dissemination in actions under respectively two multi-annual research and innovation programmes: the Horizon 2020 Framework Programme for Research and Innovation in the European Union (2014-2020), which has its legal basis in the Treaty on the Functioning of the European Union, and the European Atomic Energy Community Programme (2014-2018) complementing Horizon 2020, which has its legal basis in the Euratom Treaty, as well as the Commission Communication providing the overall political narrative and background to these legislative proposals.

The analysis of the impact of the two legislative proposals will be performed in the same report, for the reason that the content of the rules for participation and dissemination is very similar in both multi-annual framework programmes and inspired by the same rationale. Nevertheless, the specificities of each of them will be duly taken into account where appropriate, particularly with regard to the Euratom research activities on Fusion. The Staff Working Document consists of a full report, and detailed Annexes and is accompanied by a 10-page executive summary.

The purpose of the rules is to define the rights and obligations of legal entities intending to take part in the actions envisaged by the respective framework programme and to establish the principles for the exploitation and dissemination of the results of these actions.

Therefore, the rules are complementary to the above-mentioned framework programmes, as the objectives of the Research and Innovation policies and the resources for their funding are provided for in the latter. For this reason the societal, economic and environmental impacts of the future frameworks and its European added value are thoroughly analysed and presented in the respective Impact Assessment accompanying the Horizon 2020 Framework Programmes.

Also, financial instruments envisaged under the Horizon2020 will apply the rules developed under the legislative proposal for 'Debt and equity platforms'. The Rules will not derogate from provisions that are currently being developed by the Commission. For that reason they do not fall in the scope of the Rules and subsequently of this Impact Assessment report which is limited to grants, public procurement and similar instruments.

Conversely, the bulk of the administrative costs for the applicants and participants and consequently important part of the simplification potential can be allotted mostly to the application of the provisions of the Financial Regulation and the Rules for Participation. Therefore, these issues will form the core of the analysis in this Impact Assessment. These issues and in particular simplification of future EU actions are considered of utmost political importance and their analysis should be proportional in depth and scope.

In addition to the fact that the Rules for Participation form a separate legislative proposal based on their specific legal basis distinct from Horizon2020 itself and keeping in mind that assessing their impact in the Impact Assessment for Horizon2020 could lead to the marginalisation of the aforementioned issues it was decided that they should be the object of a dedicated Impact Assessment.

Although two separate reports are prepared, it needs to be noted that the strong link with the main Horizon2020 Impact Assessment has been ensured during the work and is mirrored in the text of this report. The latter complements and develops more in detail certain general principles envisaged in the former.

As the Rules for Participation are not a basis for the Union expenditure, and are therefore not accompanied by the financial statement, this impact assessment is not intended to serve as an ex-ante evaluation.

1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Organisation and timing

Consultation with other Directorate-Generals was carried out through an Inter-service Steering Group composed of DG Information Society and Media, DG Enterprise and Industry, DG Education and Culture, DG Energy, DG Mobility and Transport, Joint Research Centre, DG Human Resources and Security, DG Budget, Legal Service and the Secretariat-General of the Commission. Set up in December 2010, the group met six times and provided contributions during the preparation of the impact assessment.

Consistency between this report and the one for the Horizon2020 was of utmost importance and has been ensured by close cooperation between services involved in their preparation.

The specific reports were prepared for and are annexed to this Impact Assessment by the Commission services examining 1) results of the survey on administrative costs of participants in the Seventh Framework Programme (hereinafter FP7); 2) human resources costs of the Commission; 3) scope of potential harmonisation of the rules governing funding research by the Joint Technology Initiatives and by common initiatives of EU and Member States; 4) prolongation and potential expansion of the Guarantee Fund.

Moreover, the results of a study by Deloitte on "Assessing the Effectiveness of Simplification Measures under FP7" were widely used in preparation of this report, particularly to verify findings of the survey concerning the relative time spent on administrative tasks within FP7 and are annexed to this report.

1.2. Policy Background

The overall political context of the legislative proposals is defined by Commission initiative "Europe 2020 – a strategy for smart, sustainable and inclusive growth" for the coming decade aiming at making EU a smart, sustainable and inclusive economy, where research and innovation are among the key issues[1]. The strategy was endorsed by the European Council in the conclusions of 17 June 2010[2], which agreed as one of the headline targets for the strategy "improving the conditions for research and development, in particular with the aim of raising combined public and private investment levels in this sector to 3% of GDP". Subsequently seven Europe 2020 flagship initiatives were shaped, among them "Innovation Union Flagship"[3] being an integrated strategy of crucial importance to meet the agreed Europe 2020 Strategy objectives, since it puts forward a strategic approach, bringing together all relevant decision-making levels and policies, in order to support the transition of the EU economy towards an energy and resource efficient and competitive knowledge economy that ensures high levels of smart, sustainable and inclusive growth and jobs, is able to face increasing global competition, and addresses societal challenges(Box 1). It aims to improve conditions and access to finance for research and innovation, to ensure that innovative ideas can be turned into products and services that create growth and jobs.

Box 1: The Communication on "Innovation Union Flagship"

The Communication on "Innovation Union Flagship" identified ten conditions necessary to achieve Innovation Union, among them declaring that *"Access to EU programmes must be simplified and their leverage effect on private sector investment enhanced, with the support of the European Investment Bank. The role of the European Research Council should be reinforced. The framework programme's contribution to nurturing fast-growing SMEs must be boosted. The European Regional Development Fund should be fully exploited to develop research and innovation capacities across Europe, based on smart regional specialization strategies."* The emphasis was also put on the *"need to work better with our international partners. That means opening access to our R&D programmes, while ensuring comparable conditions abroad. That also means adopting a common EU front where needed to protect our interests."* The following commitments were undertaken

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF

[2] http://ec.europa.eu/eu2020/pdf/council_conclusion_17_june_en.pdf

[3] Commission Communication "Europe 2020 Flagship Initiative Innovation Union" of 6 October 2010 (COM(2010) 546 final)

- Future EU research and innovation programmes will focus on Europe 2020 objectives and particularly the Innovation Union. In 2011, looking ahead to the next financial perspectives, the Commission will set out ways for future programmes to focus more on societal challenges, streamline funding instruments and radically simplify access through a better balance between a control-based and a trust-based system.
- The Commission will design future EU research and innovation programmes to ensure simple access and stronger involvement of SMEs, in particular those with a high growth potential. Further use should be made of partnerships with Member State agencies, building in particular on the experience of the Eureka Eurostars initiative.
- The Commission will promote open access to the results of publicly funded research. It will aim to make open access to publications the general principle for projects funded by the EU research Framework Programmes. The Commission will also support the development of smart research information services that are fully searchable and allow results from research projects to be easily accessed.
- The Commission will facilitate effective collaborative research and knowledge transfer within the research Framework Programmes and beyond. It will work with stakeholders to develop a set of model consortium agreements with options ranging from traditional approaches to protect IP through to more open ones. Mechanisms are also needed to further strengthen knowledge transfer offices in public research organisations, in particular through trans-national collaboration.

The **Council Conclusions** of 26 November 2010 on **"Innovation Union for Europe: To succeed in turning Europe into an Innovation Union and securing long-term competitiveness and growth"**[4], emphasized the necessity of taking a strategic and integrated approach to innovation in Europe, creating the right conditions for a globally competitive innovation environment in Europe, maximizing the impact and efficiency of resources and improving governance and monitoring progress. The need to ensure coherence and coordination between different EU policies in order to provide more efficient EU action was also stressed.

As clearly observable above, the political context Europe 2020 regarding the implementation of the EU research Framework Programmes is principally perceived by the need of its simplification, that is a key thread throughout the conclusions. As such the issue of simplification of the implementation of the Framework Programmes was a subject of numerous high-level scrutinies and was reflected in a number of papers and documents (Box 2)

Box 2: Papers and documents on simplification

Reports of experts groups

The report of the expert group on the "Evaluation of the effectiveness of the New Instruments of Framework Programme VI"[5] recommended a significant simplification of administrative procedures and financial rules to ensure *"more efficiency and flexibility in implementing participation instruments"* More generally, the report stressed the importance of finding the right balance between changing the rules and the stability of the instruments whereas in the past *"flexibility and simplification (had) either not (been) delivered or are (had been) the source of new challenges"*. Also the assessment of the impact of the new instruments introduced in FP6, published in 2009[6], largely repeated the same recommendations, which remain valid for FP7 so far. Another important Expert Group Report on 'Ex-post Evaluation of the Sixth Framework Programmes (2002-2006)' ('the Rietschel Report' followed by the Commission Communication (COM(2009)0210)) stated that "administration of the FP needs radical overhaul" and that radical simplification must be given the highest political priority if the Framework Programmes are to realise their true potential, while the Council and the European Parliament must recognise that there is a

Council Conclusions

Council Conclusions of 3 December 2009 on Guidance on future priorities for European research and research-based innovation in post 2010 Lisbon strategy underlined inter alia the necessity to make further progress on simplification and more efficient management in order for the EU Framework Programmes to fully contribute to the implementation of a post-2010 EU strategy, and which invited the Commission, together with Member States where relevant, to pursue vigorously further reduction of the administrative burden, continuing to implement the recommendations of the Evaluation of the Sixth Framework Programme.

The Council replied to Commission Communications concerning simplification in is conclusions of 26 May 2010 on "Simplified and more efficient Programmes supporting European Research and Innovation"[10], and

4 http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/118028.pdf

5 Evaluation of the effectiveness of the New Instruments of Framework Programme VI - Report of a High-level Expert Panel chaired by Professor Ramon Marimon of 21 June 2004; http://cordis.europa.eu/documents/documentlibrary/66674081EN6.pdf

6 Assessment of the impact of the new instruments introduced in FP6 - EPEC study for DG Research, Final Report of 28 September 2009; http://ec.europa.eu/research/evaluations/pdf/archive/fp6-evidence-base/evaluation_studies_and_reports/evaluation_studies_and_reports_2009/assessment_of_the_impact_of_the_new_instruments_introduced_in_fp6.pdf

collective responsibility towards the issue.

Communications of the Commission

The most recent and comprehensive approach to simplification was given in the Communication of the Commission on "Simplifying the implementation of the Research Framework Programmes" of 29 April 2010 (COM(2010) 187)7, that followed up the adoption of the Europe 2020 strategy, presenting both concrete simplification measures for immediate implementation paired with more radical simplification under the current cost-based system. Also more far-reaching changes were envisaged, moving towards a result-based funding approach that would entail a major shift of the control efforts from the financial to the scientific-technical side. Also a number of simplification measures were to be gradually introduced in FP7. For the future Framework Programmes a twofold approach (that is assessed in this report) was proposed:

– keeping the current cost-based system with the following simplification measures: 1) broader acceptance of usual accounting practices of beneficiaries; 2) acceptance of average personnel costs; 3) return to a common set of basic principles instead of a "tailor-made" approach; 4) removal of the obligation to deposit pre-financing on interest-bearing bank accounts; 5) more lump sum elements, 6) removal of the legal requirement to consult lists of selected proposals with committees of Member States representatives

– moving towards a result-based funding in the form of 1) project-specific lump sums as a contribution to project costs estimated during grant evaluation/negotiation, and paid against agreed output/results; 2) selection of the proposals promising the highest scientific output for the specified lump sum; 3) distributing pre-defined lump sums per project without further control by the Commission to the awardees selected in a highly competitive process.

Another Communication of the Commission of 26/05/2010[8] proposed to raise the tolerable risk of error currently applied by the Court of Auditors (a standard 2% materiality level for the legality and regularity of transactions underlying payments) while attaining this error rate[9] in the field of Research may lead to costs of control exceeding the benefit from recovered amounts and putting the additional burden on beneficiaries.

of 12 October 2010 on "Making EU research and innovation programmes more attractive: the simplification challenge"[11]. The Council identified simplification as a key issue for the forthcoming research and innovation programmes and recognized the need for a critical review of the current set of programmes and instruments and the coherence of their rules. It also supported a more trust-based approach consisting of limiting EU monitoring and control to the minimum necessary to safeguard public funds. In this respect it suggested combining a tolerable level of error and risks with accountability and sound financial management.

Resolution of the European Parliament

Similar conclusions of the European Parliament were expressed in the resolution on simplifying the implementation of the Research Framework Programmes adopted on 11 November 2010 (P7_TA(2010)0401)[12] finding the management of FP7, despite the improvements made in relation to FP6, still characterised by excessive bureaucracy, low risk tolerance, poor efficiency and undue delays and acknowledging stakeholders call for further simplification and harmonisation of rules and procedures. It recommended a reduced set of rules for funding, called for coherence and harmonisation, recommended further internationalisation, called for flexible EU rules to align better, where possible, with existing different national regulations and recognised accounting practices, and suggested the incorporation of the rules for participation into the body of the Financial Regulation. It expressed view that the management of European research funding should be more trust-based and risk-tolerant, finding the current system and the practice of FP7 management excessively control-oriented and rather avoiding than managing risks. It called for aiming EU monitoring and financial control primarily at safeguarding public funds and combating fraud, whilst distinguishing clearly between fraud and errors.

In reaction to these and pursuing its commitment to simplification, the Commission has adopted three specific measures[13]:

- ✓ Revised criteria for the acceptance of average personnel costs as being eligible in FP7;
- ✓ Flat-rate financing for SME owners and other natural persons not receiving a salary;
- ✓ A Research Clearing Committee to ensure uniform interpretation and application of the FP7 rules and procedures.

Following the FP7 Interim Evaluation[14], published in November 2010, the Hungarian EU Presidency organised on 24-25 February 2011 a conference on the Interim Evaluation of FP7[15], and the Council

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7 http://ec.europa.eu/research/fp7/pdf/communication_on_simplification_2010_en.pdf

8 http://ec.europa.eu/budget/library/biblio/documents/control/com_2010_0261_risk_error_balance_en.pdf

9 Error rate refers to the expected level of error remaining in the auditable population after the corrections resulting from the audit findings

10 http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/114640.pdf

11 http://register.consilium.europa.eu/pdf/en/10/st14/st14980.en10.pdf

12 http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P7-TA-2010-0401&language=EN

13 Commission Decision of 24 January 2011 "on three measures for simplifying the implementation of Decision No 1982/2006/EC of the European Parliament and of the Council and Council Decision No 970/2006/Euratom and amending Decisions C(2007) 1509 and C(2007) 1625 (C(2011) 174 final)

14 Interim Evaluation of the Seventh Framework Programme – Report of the Expert Group, Final Report of 12 November 2010. (http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/fp7_interim_evaluation_expert_group_report.pdf).

adopted its conclusions[16] of 9 March 2011, both drawing attention to how reducing complexity and simplifying participation are important in FP7 and in the wider context of the future Common Strategic Framework for EU Research and Innovation funding.

The above list of declarations and actions demonstrates the clear and long-standing political support for the simplification of access to EU research programmes as a measure of contributing to achievement of "Innovation Union Flagship" objectives. As will be shown in the next sections, there is also a strong and sustained stakeholder support for initiatives in this direction. The legislators and the vast majority of received opinions call for **simplicity, stability, transparency, legal certainty and consistency** in the rules and procedures implementing the research and innovation programmes. Need of flexibility suitable to characteristics of distinct initiatives was also their major concern.

1.3. External consultation and expertise

A review of multitude of consultative activities for preparing the rules for participation is given in Box 3

Box 3: Consultative activities for preparing the rules for participation:

- ✓ The Green Paper open consultation, which included a number of questions addressing the implementing aspects of the research programmes. This consultation had an unprecedented success with 775 position papers received (including 106 from government bodies) and more than 1300 online responses[17].
- ✓ An online survey of FP7 beneficiaries (covering Euratom beneficiaries participating in the Fission indirect actions[18]) on possible options and scenarios for the future funding rules. Around 3900 participants in the Seventh Framework Programme, covering all sectors and types of beneficiaries, replied to the online questionnaire.[19]
- ✓ A survey addressed to the 27 Euratom Fusion Associations to collect information on their administrative costs (mainly on the management of the contract of association and EFDA tasks, in particular the Euratom financial contribution) and their views on simplification;
- ✓ Dedicated workshops gathering the National Contact Points for Legal and Financial matters[20] and key European stakeholders in EU research and innovation; [21]
- ✓ A comprehensive study carried out by Deloitte on the assessment of the effectiveness of simplification measures under FP7, which also included interviews and round table meetings with a sample of FP7 beneficiaries;
- ✓ Sector studies, as the analysis on Administrative Costs of Participants in Entrepreneurship and Innovation Programme – EIP (DG ENTR), Evaluation of the Executive Agency for Competitiveness and Innovation (DG ENV), etc.;
- ✓ Expert group reports on the implementation of the research programmes: Expert Group on the "Evaluation of the effectiveness of the New Instruments of Framework Programme VI", Expert Group Report on 'Ex-post Evaluation of the Sixth Framework Programmes (2002-2006)", Expert Group in charge of the Interim Evaluation of the Seventh Framework Programme, etc.;
- ✓ Views expressed in other public consultations, bi-lateral and multi-lateral meetings with stakeholders and opinion surveys relating to science and technology and research policy issues. This includes the numerous contributions to the simplification debate triggered by the 2010 Communication on simplification;
- ✓ The public consultation on a possible successor to the Competitiveness and Innovation Framework Programme (CIP)[22];
- ✓ An external evaluation of the EIT[23] and an open public consultation on the EIT[24].

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15 See http://www.tetalap.hu/fp7interim/

16 3074th Competitiveness Council of 09.03.2011 on "Conclusions on the evaluation of the Seventh Framework Programme for Research (FP7), including the risk-sharing finance facility".

17 COM(2011)48 of 9 February 2011 - Green Paper - From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding, with deadline for contributions on 20 May 2011

18 Indirect actions as opposed to direct actions carried out solely by the Commission itself, namely Joint Research Centre. As activities of the JRC are defined in other legal acts, direct actions are not subject to this Impact Assessment

19 Open from 11 February till 4 March 2011

20 On 4 April 2011

21 On 28 April 2011 – List of participants in Annex I

22 The Competitiveness and Innovation Framework Programme (CIP) is organised around three specific programmes: the Entrepreneurship and Innovation Programme (EIP); the Information and Communication Technologies Policy Support Programme (ICT PSP); and the Intelligent Energy-Europe Programme (IEEP).

1.3.1. Consultation on the Green Paper - Stakeholders' opinions

The Green paper open consultation included questions on the attractiveness and accessibility of EU research and innovation funding, the required level of harmonisation in the rules, as well as the intellectual property provisions that will appropriately support competitiveness while allowing access to and dissemination of scientific results.

The consultation gave stakeholders the possibility to respond in two ways - via an on-line questionnaire and via more detailed position papers (for messages from the latter see table 1).

[23] External Evaluation of the European Institute of Innovation and Technology, published on 31 May 2011 by ECORYS. The external evaluation focussed on the achievements and lessons learnt from the setting-up phase of the EIT.

[24] DG EAC has launched an open public consultation (OPC) on the EIT on 14 April 2011. The consultation ran until 30 June 2011 and has received 134 responses through the online questionnaire and 46 position papers (number is still increasing).

Table 1: Stakeholders' views expressed in the position papers

Questions	Member States	Funding agencies	Higher Education Institutions and other public sector R&D performers	Business organisations
How to make EU research and innovation funding more attractive for participants?	• Reduce the number of instruments, removing overlapping. Continuity of successful instruments • Improve communication of the programmes and calls • Reduce paperwork, simplify and harmonise rules, procedures and requirements • Apply a more trust-based / risk tolerant approach • Continuity of the cost-reimbursement logic is preferred to a radical change toward output-based grants. In such context, accept where possible the usual practices of the beneficiaries and/or national procedures			
	• Smaller consortia and/or small size projects should be more easily allowed • Consider higher Tolerable Risk of Error (TRE) for a right balance between trust and control • More use of lump-sums/flat rates • Improve coordination and synergies between EU instruments • Cover the full innovation cycle from ideas to market	• Apply a single audit approach to reduce the number of audits • Less reporting requirements during project execution • More autonomous agencies	• Have excellence as the main selection criteria. • Researcher-driven schemes should be promoted • Smaller consortia and/and small size projects should be more easily allowed • Increased use of two-stage calls • Involve the scientific community in the preparation of the work programmes	• Smaller consortia and/or small size projects should be more easily allowed • Involve business in the preparation of the work programmes
How to ensure the balance between a unique set of rules and the need for flexibility to achieve the objectives of different instruments, and respond to the needs of different beneficiaries, in particular SMEs?	• A unique and simpler common set of rules is necessary, but these rules should be flexible and, where needed, include targeted provisions for specific groups of beneficiaries • Participation of SMEs should be further promoted via dedicated instruments and streamlined procedures • Requirements and constrains fixed in the rules should be reduced and simplified; project implementation should be, thus, more flexible			
	• Tailor-made solutions could be needed for specific actors • More flexible work programmes and implementing rules • Flexible rules allowing for usual accounting practices of participants	• Tailor-made solutions could be needed for specific actors	• Tailor-made solutions could be needed for specific actors • Flexibility during project execution • Align where possible with national practices	• Uniform interpretation of rules is more important than a unique set of rules
Should new approaches to supporting research and innovation be introduced (e.g. through public procurement, pre-commercial procurement, and/or inducement prizes)?	• Public procurement receives a wider support than the introduction of inducement prizes and awards as alternative new approaches Inducement prizes can however be regarded as an effective way to stimulate research and innovation, provided that they are highly visible, attractive and well marketed as an Europe-wide acknowledgement of achievements			
			• Stress the need to clarify legal issues related to these new approaches, especially on intellectual property rights	• Generally in favour of introducing public procurement approaches to drive innovation • Prizes for innovation may not be attractive because the chances of success are too small
How should international cooperation with non-EU countries be supported?	• Use international cooperation to support EU interests (competitiveness, economic development) • EU international cooperation should follow a strategic approach and pursue reciprocity (i.e. participation and funding) • Global problems and common strategic interests should be the key drivers of international cooperation			
How should intellectual property rules governing EU funding strike the right balance between competitiveness aspects and the need for access to and dissemination of scientific results?	• For publicly funded research, the free dissemination of its results (at least after a delay) should be the rule. • A specific case by case-approach depending on the subject matter (e.g., software, medication, scientific articles, etc.) as well as on the kind of research concerned (basic, pre-market) seems suitable. • The design and the practice of the current FP7 System appears to be balanced and adequate, in particular the approach of solving problems mainly at the individual level (GA, CA) while having a State institution as a safeguard; though, also MCA should be adopted. In any event, a future system should remain flexible. • Open access, open source and patenting (probably with a deadline for a registration) seem to be adequate instruments for the dissemination of results and their promotion, but there should generally be more awareness-rising and more assistance as to IPR. • An at least partial harmonisation of the legislation should take place (above all through an EU Patent). Furthermore, IPR Rules should be more consistent throughout all EU Programmes.			

Source: Green Paper open consultation position papers.

The responses to the online questionnaire confirmed the opinions provided through the position papers. The overwhelming majority of respondents were in favour of **considering simplification as a key priority in the future Framework Programmes** and expressed strong support for more coherence in the rules and procedures, while at the same time stressing the need to maintain flexibility and to tailor rules to specific groups of beneficiaries, such as SMEs and the Knowledge and Innovation Communities (KICs). On the latter, respondents have advocated the need to preserve or further strengthen their flexibility, which has been instrumental to their early success[25].

1.3.2. Consultation of beneficiaries

For gathering quantitative evidence on the administrative costs of participation, an **online survey among FP7 beneficiaries** (covering Euratom beneficiaries participating in the Fission indirect actions) was carried out. Substantial information was collected (3900 responses) on the administrative costs associated with participation, as well as views on possible options and scenarios for the future funding rules. Data on the administrative efforts required by participants in FP7 projects provide the appropriate evidence to substantiate the baseline scenario for the future funding rules, as discussed later in this document. The survey respondents also expressed their opinion on three proposed funding scenarios, consisting of: i) funding based on reimbursement of actual costs with simplified rules, ii) output/results based funding with project-specific lump sums granted to entire projects or iii) the extended use of lump sums, flat rates and scales of unit cost elements in a cost reimbursement system. Finally, respondents had the opportunity to provide comments in each part of the survey, as well as to give their views on potential simplification measures for the future Framework Programme.

The results of the online survey on administrative costs for participation were discussed in two workshops, gathering respectively the National Contact Points for Legal and Financial matters and key stakeholders in EU research and innovation funding. Clear preferences with regard to the proposed scenarios became apparent during the discussions. In general terms, the **scenario offering simplified actual costs gathers the most positive views, if combined with a harmonised application of the rules and improved communication and assistance to the participants**. The other two scenarios (output-based funding with project-specific lump sums for entire projects and extended use of flat rates, lump sums and scales of units) are perceived only as viable alternatives, if restricted to specific areas/projects/partners or if proposed as options alongside the first scenario.

Finally in the context of the external study on 'Assessing the Effectiveness of Simplification Measures under FP7' a round table meeting with FP7 stakeholders was organised to assess the relevance and feasibility of several simplification recommendations and trust-based options for future research and innovation activities. The conclusions of this meeting are broadly consistent with the outcome of the survey and the two workshops above.

For gathering quantitative evidence on the administrative costs of Euratom participants in research actions on Fusion, a survey among the 27 existing Euratom Fusion Associations was carried out. Substantial information was collected (19 responses out of 27) on the administrative costs associated with participation, as well as views on possible options and scenarios for the future funding rules.

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[25] "A balance will have to be found for the European Institute of Innovation and Technology (EIT) between much needed flexibility and freedom on the one hand and its alignment within a common framework on the other hand."
League of European Research Universities – LERU

"The UK is pleased that the European Institute for Innovation and Technology (EIT) is included within the broad remit of the Common Strategic Framework but considers that greater autonomy could be beneficial (…) We consider that EIT should have the autonomy and flexibility to organise itself in the most appropriate way, but within the broad framework of the future Common Strategic Framework".
UK: Department for Business Innovation and Skills

1.3.3. Summary of the stakeholders' opinions

7 key messages emerge from the opinions expressed by stakeholders and experts, which can be summarised as follows:

1. The future programme is seen as an ideal opportunity to simplify the EU funding landscape by reducing the number of instruments, removing overlap and improving the coordination with other sources of EU and national funds.

2. More simplification is a top priority in order for the future programme to make EU research and innovation funding generate more impact and be more attractive to participants.

3. In this context, more coherence in the rules and procedures receives strong support, while at the same time stakeholders stress the need to maintain flexibility and to tailor rules to specific groups of beneficiaries, such as SMEs and the KICs.

4. Continuity and legal certainty remain core issues for all stakeholders[26], together with the principles of trust and excellence.

5. The discussions in the workshops confirmed that the conclusions on administrative costs for participants drawn from the online survey of FP7 beneficiaries appear reasonable and allow defining the baseline scenario for the impact assessment of the future Rules for participation.

6. In terms of potential funding scenarios, the scenario offering simplified actual costs gathers the most positive views, if combined with a harmonised application of the rules and improved communication and assistance to the participants. The other two scenarios (output-based funding with project-specific lump sums for entire projects and extended use of flat rates, lump sums and scales of units) are perceived as viable alternatives, if restricted to specific areas/projects/partners or if proposed as options alongside the first scenario.

7. With regard to the future Horizon 2020 rules on exploitation and dissemination, broad support was expressed for continuing the existing FP7 framework which is viewed as constituting a good balance between the interests of the different stakeholders while leaving enough flexibility for participants to determine specific rules fit for their own project. There was a general caution against making any radical changes. Common exploitation and dissemination provisions for comparable funding schemes are favoured but some flexibility must remain for justified cases. Open access to research publications was accepted in principle.

[26] Also the Euratom Fusion Associations, except Hungary, indicate that they would prefer stability, maintaining the current system of Contracts of Associations under the future Euratom Framework Programme. However, the Associations considered it necessary to introduce some improvements (increase the use of Implementing Agreements and of project-specific lump sums) and simplification measures (the top priority simplification measures being the increase of projects and the participation to the EFDA priority support, and putting the financial support given under EFDA outside the Baseline support). They also considered necessary to guarantee at least the 20% of Baseline support from the Community to the fusion activities.

Box 4: Consultation on other programmes

The public consultation on a possible successor to the CIP

The public consultation process consisted of:

– an online survey (including specific survey on financial instruments), it was open from 8 November to 11 February 2011. A total of 676 answers and 76 written contributions were registered;

– a public conference that was organised on 25 January 2011 and was attended by more than 550 participants, representing a wide variety of stakeholders (associations of financial intermediaries, business organisations, companies, innovation agencies, universities, etc);

– meetings with the representatives of the Members States in the different CIP management committees (meeting of the CIP Joint Management Committee meeting on 25 January 2011, meeting of the Entrepreneurship and Innovation Programme Management Committee on 16 and 17 March 2011);

– a meeting with the members of the CIP Strategic Advisory Board on 2 February 2011.

On the programme management there was a general desire to simplify the structure of the programme and to have experts on innovation on the management of the programme. The need for a robust development of monitoring and evaluation, as well as increased co-ordination and exchange of best practices was also broadly supported.

As far as the relations with other EU programmes are concerned, respondents underlined the need to increase coordination and coherence with other EU instruments, in particular the Structural Funds and the Framework Programme for research and technological development (FP), to create synergies and avoid duplication.

EIT evaluation and EIT open consultation

The first external evaluation of the EIT has found development of the EIT effective, efficient, and relevant, as well as demonstrating EU added value. The main conclusions as regards autonomy and simplification are the following:

– The ability of the EIT to act autonomously of the European Commission is widely welcomed.

– The EIT should continue to develop its own practices in key areas, particularly around the simplification agenda.

– The EIT should seek to develop best practice and become a role model for other Commission activities, in particular around the question of simplification.

A preliminary analysis of the results of the open public consultation shows widespread consensus that flexibility is essential for the KICs to attract participation from the business sector. The response of the business community, business associations, chambers of commerce and individual companies is to be highlighted. Many stakeholders have expressed concern that the objective of excessive harmonisation is given priority over simplification and flexibility. It is argued that "*The EIT/KICs might lose their richness for having a homogeneous process.*", that "*There should be a fair degree of flexibility left, as policy objectives require a variety of instruments." "Imposing the same regulatory straightjacket on all activities could even lead to an increase of red tape."*

1.4. Opinion of the Impact Assessment Board

The draft version of the impact assessment report has been submitted to the Impact Assessment Board on 27 July 2011. The comments of the Board, discussed during its meeting and received subsequently in writing, have been carefully analysed and resulted in number of the changes to the report. In its opinion following the meeting, the Board requested some additional work and indicated five recommendations for improvements of certain technical aspects. These comments have been taken on board in the final draft of the IA as follows:

1) The scope of the report has been clarified,

2) The baseline scenario has been strengthened (particularly in relation to SMEs and international cooperation),

3) A better defined objective on international cooperation and a set of indicators have been added in order to clarify the intervention logic,

4) Intertwining between policy issues that were taken into account in the presentation of the options in two sets, have been highlighted and more details provided on the reasons for discarding certain options, improving the description and presentation of the report.

5) Additional information has been provided on simplification as well as on monitoring and evaluation.

2. PROBLEM DEFINITION AND SUBSIDIARITY

2.1. Background of the FP7 rules and lessons learned from its evaluation

In the history of EU research, funding changed gradually from an *ad hoc* approach without an explicit legal base, through an integrated vision for research started with the first Research Framework Programme in 1984 to including in the Single European Act a separate chapter on research and technology development. Six successive framework programmes followed with an annual budget steadily increasing and arriving in FP7 to an average of 7217 million euro per year, becoming the world's largest research program (see exemplary comparison with NSF (US), DFG (DE) and ANR (FR) programmes in Deloitte report – Annex II), open to participation from any country.

In light of the increased number of involved Member States and associated countries, the ever-growing international cooperation and the evolution of objectives inducing diversity in types of actions and of actors, the following explanation of the roots of the problem taken from the Commission Staff Working Document "Simplification in the 7th Framework Programme (COM(2005)119 final)" is as true as it was at the time of its publication. *"Over the past 20 years the Community's research Framework Programme has expanded significantly in terms of budget, scale, scope and ambition. In line with this expansion, a range of different types of support have been developed to target an increasingly broad range of beneficiaries across an enlarging geographical area. This evolution has brought with it increased complexity in terms of a multiplication of types of instrument, forms of contribution, requirements for submission and reporting, and rules of implementation. As well as the greater breadth, increased financial support, and growing number of participants associated with the projects being funded, this complexity has been accentuated by the need for internal and external controls to ensure that Community funds are spent wisely and correctly."*

This of course does not mean that nothing was done to simplify implementation of the consecutive Framework Programmes. Significant efforts were undertaken for FP6 and a series of measures linked to ten simplification objectives were announced when FP7 was launched. The most successful proved to be the development of the Unique Registration Facility; the introduction of a threshold of EUR 375 000 contribution for the requirement for an audit certificate, and the introduction of the guarantee fund which exempts participants with less than EUR 500 000 contribution from ex ante financial viability controls and removes joint liability of the consortium participants towards the EU. However, other measures considered as potentially important for stakeholders, namely 1) the introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants; 2) a clearer definition of eligible costs, and improvements to the services and guidance documents for applicants; 3) a simpler cost reporting system; and 4) a simplified support rate per type of activity; are not perceived by beneficiaries as having been successfully implemented[27].

Conclusion drawn from the above is that *"while overall, FP7 simplification measures have been partially successful, measures have not been perceived as helpful to increase participation of less represented target groups such as SMEs, newcomers and small players in general. As a consequence, FP7 is still perceived as a 'closed shop' for experienced participants"*.

The practical implication of the three simplification measures adopted by the Commission Decision of 24 January 2011 still remains to be seen. An initial assessment of these measures in Deloitte report is the following: *"the measure on "average personnel costs" is a very important measure while the "Research Clearing Committee" has potential but cannot be assessed at this moment. The measure on eligible costs for SME owners will only affect a limited number of beneficiaries but should have a significant impact on them."*

[27] For complete overview of implementation measures introduced when FP7 was launched and their impact so far see Deloitte report on simplification, p.14 (Annex II)

The final report of the Expert Group in charge of the Interim Evaluation of the Seventh Framework Programme, was published on 12 November 2010. It comprised a thorough analysis of participation patterns and simplification in FP7. It identified a number of central problems for the rules for participation and dissemination and made the following recommendations:

"Simplification needs a quantum leap, and the Expert Group calls for all Directorates- General and agencies rapidly to implement the short-term simplification measures recently put forward in a Communication by the Commission and to ensure that they are applied rigorously from 2011-2013. Coherence of procedures and approaches between Commission Directorates General and the Executive Agencies responsible for administering FP7 is of crucial importance. The Expert Group proposes that the Commission consider the upcoming revision of the Financial Regulations as an opportunity to create more flexible conditions for research in subsequent FPs. In addition the Group pleads for the Commission to switch from its present low-risk/low-trust attitude to a more trust-based and risk-tolerant approach."

The Expert Group also recognized the vast and impressive reach of the Framework Programme, the fact that calls have been developed and processed effectively at a procedural level and that the procedures have ensured that funds are allocated in a reasonably timely manner and with the highest standards of integrity. It noted however wide-spread criticism of the complexity of rules and regulations adopted as well as inconsistency in the legal structures and procedures that discourage industry, universities and research organizations from participating in the Joint Technology Initiatives (JTIs). It also highlighted the importance of retaining stability in the FP and of avoiding disruptive changes to procedures, now familiar for the research community unless good reasons for change are proven. It emphasized the role of industry as the bridge between research and 'commercialisation' in fostering innovation and reminded that SMEs are consumers as well as performers of research and that for them access to research findings is frequently most valuable. In view of fully achieving innovation of RTD projects it called for improvement for average amount of 'time-to-grant'. In view of future Framework Programmes it suggested a one-to-one-principle by which a new measure can be launched only if an equivalent one is removed from the portfolio.

As an element of learning from past experience the considerations and conclusions of the report, together with opinions of beneficiaries and legislators were used in the process of identifying the problems that are to be answered by the future rules for participation and dissemination of results.

2.2. Description of the problem

The purpose of the rules for participation is to implement the EU multi-annual framework programmes by defining the conditions of participation to the Framework Programmes' indirect actions, the procedures to be followed for introducing proposals as well as principles for the evaluation, selection and award. The rules determine the form, rates, and conditions of the Union financial contribution. They set out exceptions and complementary provisions to the provisions of the Financial Regulation and its Implementing Rules, and for matters not covered by the rules the two latter acts apply directly. In addition, these rules also lay down the rules regarding exploitation and dissemination of the results which are generated by the indirect actions.

It is of utmost importance for realization of the objectives of the programmes to ensure attractiveness and accessibility for the entities wishing to participate in it. The numerous documents cited above identified a number of issues that currently hinder that access as well as their underlying causes. They also indicate prerequisites for attaining expected level of attractiveness and accessibility, namely clarity of rules and instruments; an overall participant-centred orientation of the initiatives and their implementation; consistency and stability; and lightness and speed of administrative procedures and processes, from application, over reporting, to auditing. The problems met in implementing the rules and the reasons for which the current conditions of participation are regarded as unsatisfactory are identified below.

- **Simplifying administrative procedures**

All documents and opinions of the stakeholders point to **complexity of administrative procedures** together with related **excessive administrative burden** as the most important obstacles to effectiveness of participation in the research framework programme. Therefore the need for simplification of administrative procedures was given utmost attention in the comments from stakeholders and in the documents of the institutions involved in the legislative process. Although recognizing the progress made, the European Parliament found the current management of FP7 still characterised by excessive bureaucracy, low risk tolerance, poor efficiency and undue delays. It also acknowledged stakeholders calls for further simplification and harmonisation of rules and procedures. The Council identified simplification as a key issue for the forthcoming research and innovation programmes and as a crucial and urgent necessity to overcome the current complexity of funding leading to excessive administrative burden and discouraging potential beneficiaries. In the same line, the opinion of the expert group evaluating FP7 also referred to the issue that warranted most attention. The group found that 'complication' *"continues to deter (and exasperate) researchers and, especially, can be a daunting obstacle to effective industry participation"* and classified existing shortcomings in simplification in three distinctive categories:

1) The constraints imposed by the EU's Financial Regulation and the resulting limitations on flexibility. Some of the unresolved issues may find solution following the adoption of a modified Financial Regulation proposed by the Commission;

2) Those that derive from the design of the Framework Programme, and are presented below;

3) Choices made by, or management guidelines issued to, operational staff by the Directorates in the Commission (and agencies) responsible for day-to-day administration. These result on lack of consistency in the management of the Framework Programme as regards interpretation, communication, performance, late publication of Work Programmes, lack of information prior to publication of calls; long time to contract/ grant; stronger focus on financial issues than on exploitation of research results; too high level of detail required for audit certificates, uncoordinated audit management; and heavy reporting procedures, etc.

Provided that the above remarks will be duly taken into account when formulating the objectives of the proposed legislative initiatives, **they will be balanced with the preference clearly expressed and strongly supported by participants not to have a "revolution" in the rules for participation.** When presenting the options for introducing changes in the current provisions, one of the major sources of concern of stakeholders is the resulting **lack of stability of the rules** that could lead to disruptions in the implementation process and would require additional learning effort from participants. Stability of existing rules is perceived as very important for all the users of the FP, therefore any simplification must outweigh the costs of its implementation. As Deloitte study states: *"Ever-changing rules are often a cause of additional administrative burden and irritation rather than a lever for removing the negative effects of red tape***". The advantages of stability in procedures mean that they should, at most, be adjusted rather than radically altered**. Otherwise, there is a risk of further disruption from the need for all sides to 'learn-by-doing'. A lesson learned from FP7 is that many of the problems that occur in the first two years of a Framework Programme are caused by the procedures not being ready and sufficiently tested in due time. Envisaged changes should be agreed early and incorporated in any administrative arrangements before calls are issued. These arrangements should apply not only to the rules of participation, but also to Model Grant Agreements, reporting/auditing guidelines and the submission system, as well as the associated IT systems. The clear implication is that a degree of continuity should be encouraged; and such is also the message passed by stakeholders during the consultation on the possible scenarios for the future rules. It needs to be noted that a simplification involves a number of actors, participants themselves not being excluded. Findings of Deloitte study on the responsibilities of the key players were summarized in the following way:

Figure 1: The role of the key players in achieving further simplification (Source: Deloitte)

- **Consistency of rules between instruments**

The stakeholders' and beneficiaries' consultations carried out in view of this IA exercise have pointed out that participants find very burdensome to apply different sets of rules depending on which EU research and innovation funding programme they participate in. Therefore, they have asked for a higher degree of harmonisation between the implementing rules stipulating participation and dissemination across the different research and innovation actions.

It is important to note that FP7 has an inherent complexity which is, nevertheless, necessary to achieve its constellation of political objectives and to foster transnational research collaboration, while taking into account the diversity of national legal systems, accounting practices and management cultures. FP7 houses a multitude of intervention mechanisms with specific rules, a diversity of reimbursement rates and special conditions for certain types of organisations. Collectively this diversified approach signifies complexity[28]. This aspect has also been pointed out in the FP7 interim evaluation report, where it is noted that *"A programme as vast and complex as FP7 inevitably has to contend with a variety of challenges, whether affecting different goals or purely administrative in nature"*.

Moreover, under FP7, the number of intervention mechanism has increased with the participation of the EU in programmes undertaken jointly by several Member States (Article 185 Initiatives)[29] and the creation of Joint Technology Initiatives (JTIs)[30]. As the FP7 rules for participation do not apply to these intervention mechanisms, each of them has its own distinct rules and creates its own legal and administrative framework, taking into account the specific operating systems. Given the criticism on this, the Commission

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28 Communication on simplification

29 Article 185 TFEU Initiatives are set up at European level for integration of national research and development programmes by the participation of the European Union in joint programmes undertaken by several Member States. The four Article 185 initiatives are currently EUROSTARS, addressing research and development performing SMEs; the Ambient Assisted Living (AAL) Joint Programme; the European Metrology Joint Research Programme (EMRP); and BONUS, a Joint Research Programme on Baltic Sea research.

30 A JTI is a legally established body (a Joint Undertaking), set up on the basis of Article 187 of the Treaty on the Functioning of the EU. JTI members are jointly responsible for monitoring progress, guiding the evolution of the initiatives and adapting the work programmes in response to changing needs. In this respect, each JTI is accountable to its founding members as well as to the Council and the European Parliament. The five JTIs are 1) Innovative Medicines (IMI); 2) Embedded Computing Systems (ARTEMIS); 3) Clean Sky (innovative, greener technologies in the field of aeronautics); 4) ENIAC (key technologies for nanoelectronics); 5) Fuel Cells & Hydrogen (FCH) (hydrogen supply and fuel cell technologies).

has been encouraged to take radical steps to streamline and harmonise procedures where possible and opportune.

Also regarding the Competitiveness and Innovation Framework Programme (CIP), it must be noted that it groups a number of actions with the single overarching objective of promoting innovation. It is achieved by various instruments which follow different implementing rules than FP7, yet derogating less from the Financial Regulation and globally perceived as simpler than the FP7 rules.

Therefore, all the above instruments have their own complexity that is intrinsic and functional to the achievement of their different objectives. Said that, it seems clear that the definition of a common set of basic principles applicable across the different research and innovation actions rather than the current diversified approach would undoubtedly lead to a considerable trimming and lightening of rules, processes and IT systems.

Considering that the Commission has proposed on 29th June 2011 to bring together all EU research and innovation funding in a coherent, from-research-to-innovation overarching framework, in order to make participation easier, increase scientific and economic impact and maximise value for money[31], the combination of these actions will clearly lead to a even more complex landscape: therefore, a significant harmonisation of implementing rules and procedures is essential to counterbalance the amplified complexity of the subject.

Keeping that in mind it cannot be forgotten that the innovation value chain is rich and diverse in terms of players (individuals, academia, research, industry), in terms of lifecycle (medium term research, proof of concept; demonstrators, small series), in terms of risk, in terms of outputs (enabling technology, prototype, product,). Such diversity may require diversified solutions and a balance between strengthened focus on results and more homogeneous processes needs to be established.

- **Sound financial management and safeguarding of the EU financial interest**

The Treaty on the Functioning of the European Union provides that "the Commission shall implement the budget (…) having regard to the principles of sound financial management". This general principle means that budget appropriations must be used in accordance with the principles of economy, efficiency and effectiveness.

Provisions governing the scope of grants laying inter alia principles of no profit for beneficiary (with certain exceptions e.g. for research scholarship paid to natural persons and prizes following contests) and obligation of co-financing paired with criteria defining eligibility of cost set the general framework that the Commission is obliged to follow for its direct and indirect actions. For instance, certain provisions in the current Financial Regulation, such as the obligation to recover the interest generated by the pre-financing, often result in procedures perceived by the beneficiaries as burdensome.

Given the above legal framework from which the Commission cannot deviate, despite the burden for participants, the current legislation has already foreseen for FP7 an easy instrument of safeguard of the EU financial interest which is the guarantee fund. According to the result of its interim evaluation, it has proved to be very effective and highly supported by participants vis-à-vis other instruments such as bank guarantees. Therefore, this part of the problem has to be seen as already properly addressed in the current legislation, and in view of an eventual policy of extension of the scope of the guarantee fund, to make it applicable to other research and innovation actions currently not covered by the FP7 rules.

[31] Impact Assessment of Horizon 2020 Framework Programme

- **Strategically targeted approach for international cooperation**

The crosscutting issue for implementation of the Framework Programmes identified in virtually all related documents is the necessity to provide a more strategic approach for international cooperation.

The significance of this aspect is illustrated by the fact that during the first four years of FP7 it has funded projects with participant organisations from as many as 169 countries. In 2010 candidate and associated countries accounted for about 9% of total applicants in retained proposals and requested Union financial contribution (with Switzerland undoubtedly being a leader). Also in 2010 alone there were 1.160 applicants from as many as 87 Third Countries (countries outside the Member States and associated countries) representing 8,5% of the total number of applicants and 3% of the total amount of requested EU contribution in retained proposals.

The legislative proposal for the Horizon 2020 Framework Programme defines the broad policy for international cooperation. Building on the experience of FP7 and in line with the need to engage more and more strategically in international cooperation, international cooperation needs to be firmly embedded throughout the whole of Horizon 2020.

The following problems have been identified with regard to the cooperation with third countries:

i) the large proportion of the EU funding for third countries is going to emerging economies (currently approximately 45%) who are strongly investing their own funds in STI and with whom the EU wishes to have a more strategic and equal relationship;

ii) the general inadequate scale and scope in EU international cooperation activities (as demonstrated by the evident fragmentation of European international cooperation and the complex funding procedures relative to the size of the funding budgets concerned) in particular with key industrialised countries and emerging economies and which limits the potential impact.

- **Need to boost innovation**

Following the adoption of the "Innovation Union" Flagship Initiative consistent support to all stages of the innovation processes from basic research, through applied research to market relevant demonstrators has become a major objective of the research framework programme. Therefore apart from dealing with complexity of procedures, future rules must also **contribute to achievement of "Innovation Union" Flagship Initiative objectives.** The Council, in its conclusions, stated that scientific excellence and basic and applied research, supported by world-class infrastructures, life-long learning, training and higher education, in particular in science and engineering, as well as incentives for commercialization of results, are preconditions for an efficient innovation system. Also more synergies between the research and innovation dimensions in the programmes should be considered. The following components were identified by the experts and in the documents of EU Institutions as having the highest impact on innovation in implementation of research framework programme:

– **Increasing participation of innovative enterprises (and in particular SMEs)**

During the first four years of FP7 implementation SMEs represented 16,6% of all participants in signed grant agreements, and their share of total project costs and requested EU contribution was 13,3% (€ 3,3 billion) and 13,2% (€ 2,4 billion) respectively[32]. As more targeted for their needs the CIP has been successful in reaching SMEs (100,000 SMEs received loan guarantees, 70% of beneficiaries of eco-innovation market replication projects are SMEs).

[32] Fourth Monitoring Report, op. cit.

Although the level of SME participation can be considered satisfactory, the percentage of 'one time only' participants (77,8% for SMEs compared to 66% FP7 average) indicate that SMEs still are not fully realising their potential participation levels due to the complexity of procedures. Also the average EU funding (249,607 EUR for SME and 326,443 for non-SME participants) is significantly smaller but that fact is rather due to the type of projects SMEs usually participate in.

The importance of SMEs in rapidly developing science-based industries for innovation has been demonstrated in many publications. Experts evaluating FP7 remarked that "*research is necessary, but not always sufficient for achieving economically significant innovations. (…) More effort should be devoted to achieving greater impact regarding innovation, in stimulating the participation of industry and SMEs, and in focusing on the whole innovation process. Without addressing these challenges rapidly, futures Framework Programmes are unlikely to fulfil expectations of their contribution to innovation in Europe*".

– Mechanisms for funding innovation in area of public procurement

Public procurement for innovation aims at promoting new forms of public procurement capable of stimulating innovation, with beneficial effects on both sides of the market. Currently in the area of innovative public procurement at EU-level, there exists no SBIR-like[33] or pre-commercial procurement scheme that would help to meet societal challenges with innovative solutions. As this issue is addressed only by a few Members States at relatively restricted level, potential of this solution that proved to have significant impacts on innovation in the US is still not addressed at European level.

➢ Management of the Framework Programme and implementation of the rules

A very important part of the problem linked to the need of simplification and reduction of administrative burden for participants was reported by the experts and in the Deloitte report as related not to the content itself of the rules for participation and dissemination, but to the **management** of the Framework Programme and their **implementation** by the services of the Commission and the Executive Agencies. The main remarks that were made are indicated in Box 5

Box 5: Other issues related to implementation of the programmes

Length of time to grant

Innovation requires reacting quickly to market opportunities and developments. Thus too lengthy procedures and long time to payment are having a deterring effect on participation of industry. Burdensome and expensive processes for participation, complex instruments, post-project auditing practices which result in unexpected financial penalties, and financial rules that are too often hard to understand were identified as major obstacles in that respect in the experts report. It appears, that industry is deterred to a greater degree than other research performers by the weight of bureaucratic burdens and, on occasion, by a perception of insufficient flexibility in Work Programmes (although results of the survey indicate that SMEs are slightly more effective in preparation and management of their proposals than other types of applicants).

The time to grant is defined as the time elapsed from the deadline of the call for submission of proposals until the signature of the grant agreement. The average time to grant for the FP7 projects is 348 days (median 334), a minor improvement compared to 2009. As a comparable example, for CIP ICT PCP part the average time to grant is assessed to be 346 days (period 2007-2009). Such average figures are perceived as a significant deterrent for participation of SMEs and

Consistency of implementation, use of IT tools, access to information

Evidence of differences of approach between Commission Directorates involved in FP7 and many examples of inconsistencies in the application of rules, both within and between specific programmes, have been recorded in reports of experts and Deloitte together with anecdotal evidence of scientific and financial officers interpreting rules differently and giving conflicting advice to participants. Even if exaggerated by word-of-mouth these discrepancies heavily impact on perceived complexity of administrative procedures.

There are still too many problems with IT tools, and poorly harmonised application, negotiation and reporting tools among the DGs and Executive Agencies involved in the Framework Programme. The current use of different systems is found by participants confusing and complex.

Communication to potential applicants is done through the Participant Portal and CORDIS portals. The

[33] Small Business Innovation Research is a programme that allows small, high-tech, innovative businesses to access the federal government's research and development funding.

[34] On the basis of data extracted at the moment of preparation of Fourth Monitoring Report.

[35] Fourth Monitoring Report, op. cit.

industry, especially when considering innovation projects, where time to market plays a significant role in determining the success in terms of take-up and use of results. There is a clear potential for improvement, as certain parts of the programme have already now - under the current FP7 rules- significantly lower average TTG figures, which could further be facilitated by simplifications in the Horizon 2020 programme.

Success rate for applicants

For the first four years of implementation of Seventh Framework Programme the rate of success for applicants varies between 12,9% and 56.8% depending on the specific programme reaching an overall success rate of 22,2% (and 21,1% in terms of proposals). Notwithstanding the increase in funds allocated to the FP during its lifetime, after firm growth in 2009, in 2010 the success rate has slightly fallen to 23,4% (and 23,9% in terms of proposals)34. After the evaluation and selection stage the total project cost of the retained proposals for 2010 is € 5,2 billion, and the aggregate project cost of the retained proposals for the period 2007-2010 is € 27,8 billion with the corresponding EU financial contribution of € 20,4 billion.

The success rate varies also depending on the Member State of origin of participants. It was also noticed by Deloitte that the success rate of the project increases proportionately to the degree of involvement and dedication of the project coordinator.

Because of the intensity of the competition for funding, not all applications from excellent researchers are funded, an outcome that will risk discouraging future proposals. **The main source of the problem is clearly the level of the funding envisaged in the EU budget**, but certain measures to alleviate this issue could be also envisaged in the rules and during its implementation.

The most promising measure to *"reduce the current massive waste of effort in writing good-quality but nevertheless fruitless proposals"*, could be a more extensive use of two-stage submission process, especially for calls with a broad thematic approach. In 2010 only 1063 out of total 13.547 applications for funding (7,85%) were submitted in reply to two stage calls (only 6 out of 63 calls were two-stage)[35]. Establishing appropriate thresholds for passing the first stage (average cost of preparation of first stage proposal counts for approx. 40% of the cost of preparing the complete proposal) would allow to participants proceeding into the second stage to have a 30-50% chance of acceptance (in line with the recommendation of experts evaluating FP7) and to the other applicants to spare on average 60% of the cost of preparation of proposals. On the basis of the survey to FP7 participants (Annex I) the average cost for preparing the proposal was estimated to be around 8000 EUR per participant and during the first four years of FP7 out of more than 312.000 applicant organisations and individuals whose proposals were included in the evaluation procedure 234.000 were not funded. It should be noted in this context that a 2 stage submission by its very nature increases the time needed from idea to contract, so that it might not be useful in areas where the success of projects in terms of innovation is linked to a short window of opportunity.

CORDIS site should be improved to make it easier for first-time users, with no prior knowledge of the FP7 structure, to find what they are looking for. The Participant Portal was created in 2009 and is integrating a series of pre-existing applications like the unique registration facility. While these are valuable means of communication, it is advised to combine them in a single tool providing a unique access point for participants. The diversity of online sources for information about FP7 calls creates unnecessary confusion for applicants and participants (more detailed analysis can be found in Deloitte report).

Risk management strategy

The Commission relies on a comprehensive control strategy including a very high number of on-the-spot auditing of projects and recovery of any amounts paid in excess in order to obtain reasonable assurance that payments are in compliance with the rules. The Commission can achieve such a positive assurance statement from the European Court of Auditors only when the level of errors is below 2%. The implementation of this control strategy has exacerbated the perceived complexity of EU research grant requirements and may discourage researchers and industry from participating in the EU research funding programmes. The magnitude of controls (audit coverage and subsequent adjustments) could be reduced with a view to lower the control burden. As a result augmenting the tolerable risk would also support a climate of trust and risk-taking which is favourable to innovation and creativity. Such a revised control strategy could focus in a more pronounced manner on targeted risk based audits and fraud prevention controls, taking into account the operational experience of the Commission anti-fraud services.

This issue was indicated in several documents as an example of **the need to introduce the risk/trust balance**: too many of the procedures appear to be designed to ensure a very low risk of delinquent behaviour by grant-holders and thus not to trust them in any way. The effect has been to introduce rigidities and excessive control mechanisms. However, as indicated in the Deloitte report, the question of trust (vs. control) for funding research projects has several meanings ranging from the lack of trust between the researchers and the Commission, leading to requests for obsolete information, to achieving a better balance between cost and trust by reducing the administrative burden or, in the extreme, to the high-trust "award" approach consisting in distributing pre-defined lump sums per project without further control by the Commission.

Although the issues listed above are of utmost concern to the Commission and a constant work is currently being performed by the services in order to improve their performance, they will not be addressed in principle in the content of the legislative proposal that this Impact Assessment is accompanying. This is because these problems do not arise from the legal content of the rules itself, but from its implementation modalities which remain the competence of the Commission on the basis of its delegated powers, and therefore cannot be adequately addressed in a legislative act of the Parliament and Council. Nevertheless the Commission is confident that following elements of the proposal would have a strong positive impact on the above points:

– Transparent and coherent rules with clear guidelines would limit the level of errors and streamline internal procedures;

– Simpler rules allowing for flexibility would, by definition, strongly impact their implementation and the management of the FPs;

– Coherent interpretation would lead to consistent implementation which would produce additional benefits in all above areas in particular limiting discrepancies in the time to grant between different services, thus leading to its considerable reduction (for the best performing ICT theme of Cooperation Specific Programme average time to grant is 264 days). It would have a beneficial impact on number of error due to lack of clarity in Commissions guidelines

2.3. Baseline scenario for adopting Horizon 2020 while maintaining current policy for its rules

As the purpose of the Rules for Participation is the implementation of the Horizon2020 Framework Programme, the underlying assumption of this impact assessment is the adoption of the preferred option identified in its Impact Assessment namely the full integration of FP7, CIP and EIT into a single framework. As such assumption is already a significant change of the policy it would affect the issues of coherence, simplification and administrative burden that are at the core of the Rules even if the content of the relevant rules for each particular instrument would remain unchanged.

Under such scenario, there would be a number of different acts established by different actors governing rights and obligations of participants in different types of actions, as well as various guidelines. Therefore at least 12 sets of rules would apply[36] with different levels of coherence between these as well as with internal differences for various funding schemes and types of participants. In addition a number of other initiatives would be adopted in a near and more distant future.

Such patchwork of the acts and provisions would continue to create difficulties, confusion and uncertainty for participants and stakeholders. Stability of the rules would be kept yet as an additional layer of complications would arise from new architecture of Horizon 2020 providing under each of its specific programmes different sets of rules. This fact would lead to the application of different provisions to actions envisaged under the same budget and legal basis.

Current level of administrative burden would be kept for all participants and no additional simplification measures would be envisaged. Differences would be kept regarding the treatment of SMEs, research organisations, non-profit bodies and secondary and higher education establishments. Also different reimbursement rates would apply under the same grant depending on the type of activity.

Regarding participation of SMEs during the first four years of FP7, their aggregated participation[37] has remained at a reasonably high level as presented in the table below.

As % of total	2007	2008	2009	2010
SME participants	16.4	15.5	14.5	16.6
Requested EU contribution	14.0	12.6	11.3	13.2

As the level of SMEs participation appears to be connected tothe overall amount of funding for the year, among other factors, the increase in funding envisaged for Horizon 2020 linked with the introduction of an specific mechanism for funding SMEs envisaged under CIP would probably lead to a further increase in these numbers. However the full potential of SMEs participation would be reduced, as no comprehensive mechanism for inclusion of innovation aspect in research projects is introduced.

For international cooperation, the adoption of Horizon 2020 with no changes to the Rules of Participation would be expected to result in a significant reduction in the ability to strategically target international partners (no expansion in the use of joint calls), a reduced European participation in research programmes sponsored by international organisations, and an effective decline of EU involvement in international

[36] FP7 rules for participation, CIP rules, EIT rules, separate rules for each Joint Undertaking (IMI - Innovative Medicines Initiative, ARTEMIS - Embedded Computing Systems, CLEAN SKY - Aeronautics and Air Transport, ENIAC - Nanoelectronics Technologies 2020 and FCH - European Hydrogen and Fuel Cell Technology Platform) and for each Article 185 Initiative (Ambient Assisted Living - AAL, Research performing SMEs – EUROSTARS, European Metrology Research Programme - EMRP, Baltic Sea Research Programme - BONUS)

[37] Numbers in the table are presented for the aggregated period from 2007 to the year indicated.

research programmes against rapidly increasing levels of international cooperation by Europe's strategic competitors.

2.4. Subsidiarity and European added value

It is important to establish a clear basis and rationale for the Union action in the areas of research and innovation. The right for the Union to act is set out in several articles of the Treaties, namely Articles Article 4 (3), 173, 183, the second paragraph of Article 188 and Article 189 of the TFEU. For the implementation of the multiannual framework programme Article 183 sets out a specific obligation to adopt the rules for the participation of undertakings, research centres and universities, and to lay down the rules governing the dissemination of research results.

Such specific obligation to determine rules for participation is not defined explicitly in the Euratom Treaty. However incorporating them in a legislative initiative adopted at the EU level (a Council Regulation) will ensure the most effective and transparent way to implement the European Atomic Energy Community research and training programmes. These rules of participation will define the rights and obligations of the legal entities wishing to take part in the Euratom framework programme and will establish, at the same time, the principles for the exploitation and dissemination of their work resulting from that participation. As it has been proved in the past, the adoption of the rules for participation at the level of a Council Regulation is the most appropriate action to guarantee in advance to stakeholders wherever they come from (Member States, associated countries or other third countries) that their participation in the Euratom research programmes is done in a transparent manner under common legal conditions applicable to everyone.

The issue of subsidiary is extensively analysed in the impact assessment concerning the Horizon 2020 Framework Programme for Research and Innovation in of the European Union, because the principle of subsidiary is relevant and must be therefore evaluated when deciding if the objectives of the Horizon 2020 as framework programme could or could not be sufficiently achieved by the Member States, and could rather be better achieved at Union level (art. 5 TFEU). Therefore, if the European added value is recognised and accepted for the EU actions under the Horizon 2020 Framework Programme, it comes directly from the Treaty on the Functioning of the EU that it needs implementing rules, i.e. the rules for participation (see Article 183 TFEU). In other words, according to the Treaty, the obligation for the Union to adopt the Rules for Participation for the Framework Programme is not the competence shared with the Member States, therefore the principle of subsidiarity does not apply to the Rules.

3. OBJECTIVES

3.1. General policy objectives

The general policy objectives of the initiative are to:

- To ensure implementation of the Horizon 2020 multiannual framework programme according to Article 183 of the TFEU, determining the rules for the participation of undertakings, research centres and universities and laying down the rules governing the dissemination of research results. The aim of the Commission proposal is to provide a coherent, comprehensive, transparent and effective set of rules taking into account participants' need for easy access and project management through simplified and harmonised procedures;

- To help achieve the objectives set out in the Commission's initiative "Europe 2020 – a strategy for smart, sustainable and inclusive growth", at the core of which are research and innovation and in particular of the "Innovation Union" flagship aiming *"to improve framework conditions and access to finance for research and innovation so as to ensure that innovative ideas can be turned into products and services that create growth and jobs"*.

3.2. Specific objectives:

In order to achieve these general policy objectives and positively respond to the above described problems, it will be necessary:

1. To increase attractiveness and accessibility of EU research and innovation funding programmes for the participants through an improved lightness and speed of administrative procedures and processes, while preserving a general stability of the rules ("no revolution" in the implementation);

2. To find a good balance between the need for harmonisation of the rules for participation and dissemination across the different EU research and innovation programmes and the need for flexibility for their effective implementation, particularly where industry is involved;

3. To ensure appropriate and harmonised protection of the EU against risks of participants' errors and insolvency;

4. To achieve strategically targeted international cooperation which will contribute to achieving the Horizon 2020 objectives to strengthen competitiveness, effectively contribute to tackling global societal challenges and support EU external policies through the adoption of a more focused and differentiated approach towards third country cooperation;

5. To boost innovation.

3.3. Operational objectives:

The specific objectives above are further broken down into the following operational objectives:

1. *To increase attractiveness and accessibility for participants*

   - Simplify the funding provisions related to grants by adopting a simplified cost reimbursement approach;

   - Reduce the administrative burden for applicants and participants.

2. *To find a good balance between the need for harmonisation and the need for flexibility*

   - Enlarge the scope of the rules for participation and dissemination, in order to set up a common set of basic principles applicable to legal entities participating in actions under the Horizon 2020 Framework Programme, when these actions receive an EU contribution from the Horizon 2020 Framework Programme.

   - Allow for necessary flexibility to address specific needs of the Horizon 2020 initiatives, e.g. EIT.

3. *To ensure appropriate and harmonised protection of the EU against risks of participants' errors and insolvency.*

   - Find the right balance between an effective implementation of the EU control strategy and a lower control burden for beneficiaries, leading to a reduced amount of participants' errors[38].

   - Extend the scope of the provisions on the guarantee fund to all actions financed under the Horizon 2020 Framework Programme (thus including also CIP, JTIs and Article 185 initiatives, the risk of which is not currently covered by the FP7 guarantee fund).

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[38] In line with the Commission guidelines, impact of legislative proposals for Horizon 2020 and its rules on this objective in view of chosen preferred option will be thoroughly analysed in the Financial Statement accompanying the Framework Programmes and therefore is not referred to in this report.

4. *To achieve strategically targeted international cooperation which will contribute to achieving Horizon 2020 objectives*

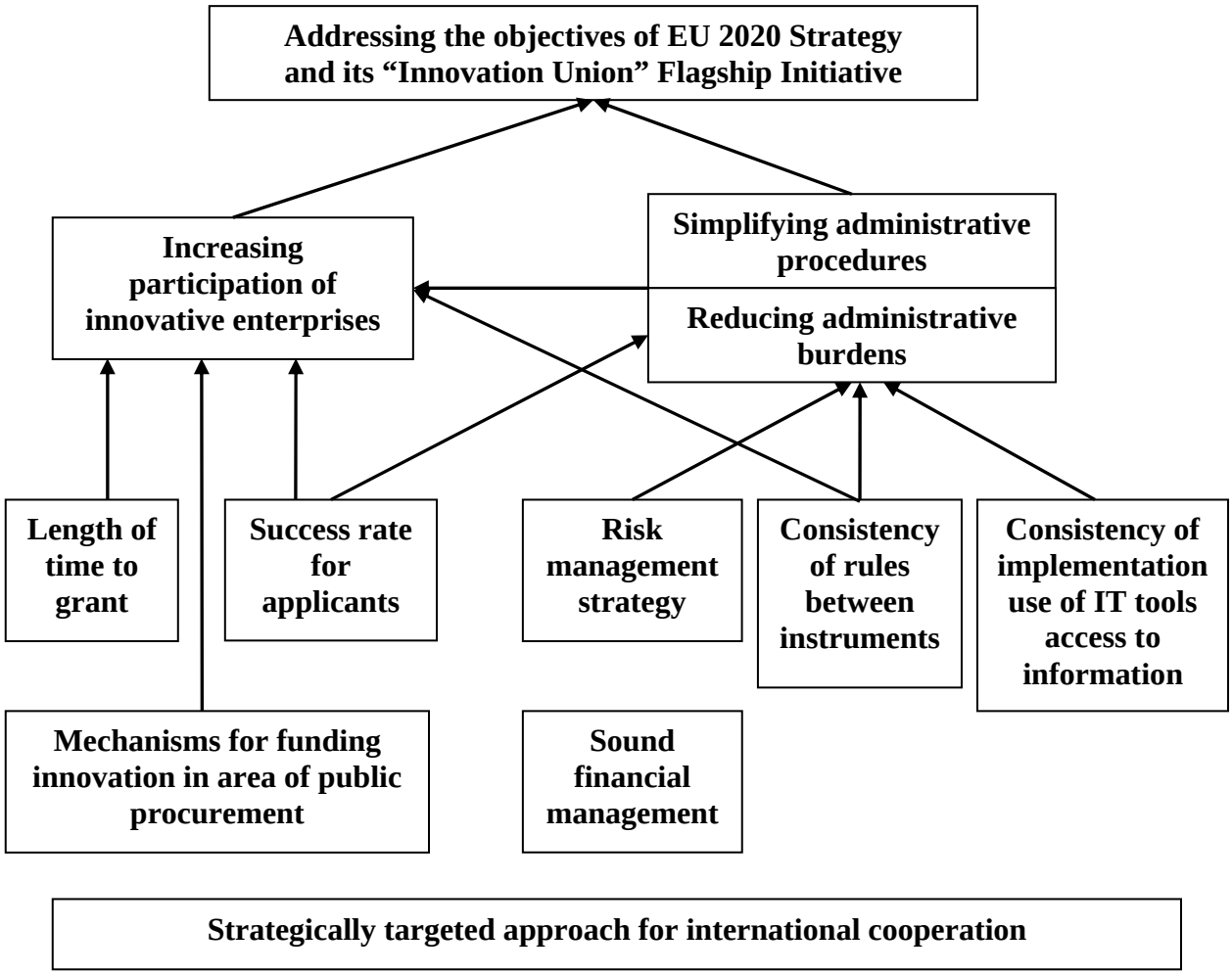
   - Greater targeting of research funding (revision of the current provisions on funding of entities from certain third countries and replacement of the former International Partner and Cooperation Countries (ICPC) list);
   - Facilitate European participation in international research actions (funding of International Organisations and of entities from third countries);
   - Enhance instruments for strategic focusing (joint calls for proposals).

5. *To boost innovation*

   - Increase the participation of industry and SMEs;
   - Provide adapted instruments for promoting innovation;
   - Stipulate a fit-for-purpose legal framework for exploitation and dissemination of research results.

The intervention logic is illustrated in the following graph (Figure 2).

Figure 2: Intervention logic for rules implementing the Framework Programme



4. PRESENTATION OF THE OPTIONS

As the TFEU in Article 183 provides for a specific obligation of the Union to determine the rules for participation of undertakings, research centres and universities, and to lay down the rules governing dissemination of research results, the option of **'no EU action'** cannot be considered as a viable option. Moreover the type of legislative action is restricted solely to the adoption of a Regulation.

The Euratom Treaty does not provide for a specific obligation to provide for the Rules for participation and dissemination. However, Article 4 of the Euratom Treaty states that the Commission shall be responsible for promoting and facilitating nuclear research in the Member States and for complementing it by carrying out a Euratom research and training programme. In order to provide a coherent and transparent framework for the participation of researchers in the implementation of this programme established in accordance with Article 7 of the Euratom Treaty, it should be complemented by the specific rules for participation and dissemination. The option of 'no EU action' cannot therefore be considered here either.

In order to achieve the objectives mentioned above, two independent sets of options have been developed, tackling the two main policy issues which the implementation of the EU research and innovation action needs to address.

The first one concerns the scope of the rules for participation and dissemination. As the future EU initiatives for promoting research and innovation are intended to be merged into a single Common Strategic Framework, the question to be answered is whether it would be convenient to keep the current state of affairs and have separate sets of rules for the different actions, or to have – where possible – a single set of rules stipulating the participation in actions under the Common Strategic Framework. The issue of "harmonisation" of the rules has been raised by beneficiaries and stakeholders on numerous occasions, reporting the existence of separate sets of rules as one of the key obstacles to participation (in particular, activities undertaken by the Union together with industry (JTIs), joint programmes of the Member States in which the Union participates on the basis of Article 185 TFEU, CIP and EIT, each have its own set of rules and do not apply the FP7 rules for participation and dissemination).

The second policy issue relates to the content of the future rules, and namely to whether or not it would be convenient to modify the current provisions in order to meet the objectives specified above.

These two policy issues are interrelated in certain aspects, as the differences in the character of the actions envisaged under current programmes will surely necessitate appropriate adjustment of the final Rules when united under Horizon 2020. Moreover, depending on the envisaged modification and simplification of the content of Rules varying level of adjustment will be necessary depending on the instrument. It will have a clear impact on feasibility of ensuring coherence as well as the choice of options analysed, resulting in discarding the extreme options which could not be reconciled with the idea of single set of basic common principles. For that reason the analysis may intertwine. Nonetheless as the main impacts of the respective issues are to large extent independent, and in order to present the data gathered in the most comprehensive manner, the result of each analysis will have its own autonomy, at the same time being complementary to build up the preferred approach

4.1. Policy issue: Scope of the rules

4.1. Policy option A1 – "Business-as-usual" option (keeping the same scope in the Rules for participation and dissemination - respectively for EU and Euratom - for the future Framework Programmes).

As already indicated under baseline scenario under this option, the current approach of having different sets of rules governing participation in different research and innovation actions and dissemination of their results will be kept: each set of rules will be set out in a 'tailor-made' regulation, taking into account the specificities of each initiative.

For Joint Technology Initiatives (JTIs) and Article 185 TFEU initiatives, this option implies that their potential future actions under the new Framework Programmes would be exempted from the scope of the rules for participation, as it is the case for FP7.

For CIP and EIT, their current specific rules will still apply.

4.2. Policy option A2 – Adopting a single set of rules for participation and dissemination implementing the Horizon 2020 Framework Programmes and setting basic common principles while allowing flexibility.

Under this option, a single coherent set of common rules for participation and dissemination would regulate the key common aspects of all actions of the future Framework Programmes, such as excellence, funding rates and eligibility of costs. This set of rules would be set up in two different legislative acts, one for the EU and one in the Euratom Framework Programmes.

For **JTIs** and **Article 185 TFEU initiatives** this option implies that the rules for participation under the future Framework Programme would apply to their future actions. This option would allow for a flexible approach, while harmonizing a number of issues by the definition of rules and/or principles[39] that would apply throughout the future Framework Programme including actions of these initiatives. These rules and/or principles would relate, in particular to:

- proposal evaluation and award criteria;
- redress procedure for applicants;
- rules on the appointment of independent experts;
- eligibility criteria for participation of legal entities;
- eligibility for funding for legal entities;
- eligibility of costs;
- upper funding limits;
- guarantee fund;
- dissemination;
- exploitation and IP rights.

The degree of feasibility of this option increases substantially if the overall rules for participation under the new Framework Programme would be limited to a basic set of rules, i.e. less prescriptive than those in the FP7 rules for participation, as it would be easier to achieve coherence within a simplified set of rules or principles. Ideally, specific rules should be flexible, permitting room for manoeuvre to cover objective underlying situations. Alternatively, derogations to the common rules could be envisaged on the basis of specific operating needs.

Extending further the scope of the rules for participation and dissemination to **CIP and EIT actions** implies having a common set of rules, set up in the same legislative act, also for instruments provided in the Horizon 2020 Framework Programme for supporting innovation and training. This would provide a unique harmonized approach for participants that would apply the same provisions for receiving the EU funding, independently of the content of their proposal. These rules would be aligned to the proposed triennial revision of the Financial Regulation, allowing for derogation only in duly justified cases, but would be kept on a more general level to allow for the necessary flexibility, describing only minimal common conditions to be met by participants.

It needs to be underlined that this scenario does not mean a total harmonisation which would imply adopting identical rules for each aspect of each action for every type of participants and abolishing all differences between their situations which, by their nature, are very diverse and cannot be reduce to single common denominator. The option of applying a set of identical strict Rules for all components of the Horizon2020 was taken into consideration and discarded as a result of the strong opposition of virtually

[39] Principles could also be included in the future Horizon 2020 Framework Programme Decision.

every stakeholder involved in these bodies who consider this option as overly restrictive and simply not feasible in practice.

With a view to facilitate the participation of programme beneficiaries, it was one of the basic policy orientations to provide for a coherent set of rules for all EU actions in the area of research and innovation. Therefore, this option is an intermediate solution since it does not foresee a one-size-fits all straight jacket for all actions: Providing as many common rules as possible for all actions in a single piece of legislation does not exclude to foresee at the same time adequate specific rules and derogations when required by the specific nature of the action. Thus, specific rules and derogations are provided for example for different types of actions in respect of the minimum conditions, the evaluation criteria, the treatment of IPR and the exploitation of research results. Moreover, it has to be noted that the numerous different pieces of legislation which currently govern the actions (FP, CIP, EIT, JTIs, Article 185 Initiatives) which will be brought under one umbrella in Horizon2020 contain a significant degree of homogeneity. It is the objective of the Rules for Participation to bring together these homogenous rules in one legislative text.

4.3. Policy issue: Content of the rules

4.1. Policy option B1 – "Business-as-usual" option (keeping the same content in the Rules for participation and dissemination for future Framework Programmes).

This option envisages continuation of the already well-established practice; no changes would be introduced to the conditions and procedures for participation (including selection, rules governing the financial contribution, dissemination, exploitation including intellectual property, etc). Under this option, the Union and the Euratom financial contribution would continue mainly to be based on the reimbursement of eligible costs in whole or in part. The other forms of financing (flat rates, scales of unit, lump sums) would continue to be considered as exceptions. No changes would be made regarding the current reimbursement rates (different maximal rates for different activities and types of participants).

Concerning Euratom rules for participation and dissemination, they would still consist of two parts, one for Fission indirect actions, and one for Fusion activities. As regards Fission, the rules would be modelled on the Horizon 2020 EU rules for participation, as it is currently the case. The rules stipulating participation in Fusion activities would keep their specificities (i.e. that actions are not implemented through calls for proposals).

4.2. Policy option B2 – Modifying the rules for participation and dissemination for the future Framework Programmes

Under this option a number of changes would be implemented in the legal framework defined by the rules for participation. These changes would include:

– **Implementing provisions for pre-commercial public procurement and** public procurement of innovative solutions **as well as 2 types of prizes**: ex-post "reward" (as envisaged in the financial regulation) and inducement prizes (for the achievement of a pre-specified target);

– **Implementation of international STI cooperation** under Horizon 2020 will be based on strategic targeting where cooperation on specific objectives of mutual interest and with specific partners will be pursued. Increased focus will be placed on bilateral cooperative activities with strategic international partner countries (industrialised countries and BRIC countries) and on cooperation at regional level for other countries. In addition the principle of general opening of cooperation activities to the participation of entities from any third country (bottom-up approach) will be maintained to encourage the reciprocal opening of third country STI cooperation programmes. The options for implementing cooperation relating to a change in the

Rules for Participation include the issues of the arrangements for joint calls with third country funding partners, are addressed below[40]:

- Revise the current provisions on participation of entities from certain third countries featuring in a list[41] to replace the former International Partner and Cooperation Countries (ICPC) list;
- Revise the current provisions on the treatment of Associated countries;
- Facilitate the funding of International Organizations and of entities from third countries;
- Introduce a provision on joint calls with third countries.

– **Modifying the rules regarding exploitation and dissemination**, e.g. envisaging open access to research publications;

– **Extending the Participant Guarantee Fund** to participants in actions of the CIP EIT and JTIs, in order to provide a wide-ranging protection of the EU financial interest while at the same time restricting the range of financial viability checks to coordinators requesting the EU contribution higher than 500.000 EUR.

– As regards the **main funding model**, three potential sub-options were identified and analysed:

(1) Option B2a – Keeping the cost-based funding with simplification of the cost eligibility criteria

This sub-option would offer a continuation of the FP7 approach based on reporting and reimbursement of actual costs (with a limited use of flat rates and lump sums) but with **simplified cost eligibility criteria.** These simplified criteria would allow for a broad acceptance of the usual accounting and management practices of the beneficiaries and a much more harmonised interpretation and application of the rules. A definition of personnel costs would be provided in order to increase the legal certainty for the beneficiaries on the eligibility of the costs charged to the projects. A single reimbursement rate per project (for all beneficiaries and activities) applied in typical collaborative research projects would bring further simplification and higher flexibility in project implementation. This sub-option would mean the continuation of ex-ante checking of cost statements before payment and the possibility of ex-post financial auditing.

(2) Option B2b – Output/results based funding (specific lump sum for the whole research project)

This sub-option would imply a radical change from the FP7 cost reimbursement system towards a system **granting project-specific lump sums for entire projects**[42]. In this scenario, the project-specific lump sums would be global amounts duly agreed during the negotiation phase based on the estimate of the beneficiaries' expected inputs (costs) for the project. **Payment of the EU financial contribution would be made against the delivery of the agreed output/results**. This sub-option would mean removing the need for detailed cost reporting and financial auditing but

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40 Specific definitions such as which countries would be eligible for 'automatic' funding, would be defined in a Commission decision rather than in detail in the legislative proposal. Whilst it is proposed that 'automatic' funding will still continue to be available for most developing countries, this will no longer be offered to the BRIC countries.

41 This list would be adopted subject to the same rules as those for adoption of the Work Programmes but would not form part of the Horizon 2020 package.

42 As defined in Point 3.3 of the Communication of the Commission: "Simplifying the implementation of the Research Framework Programmes" of 29 April 2010 (COM(2010) 187)

would require a closer scientific/technical assessment of the projects and their output/ results before payment.

(3) Option B2c – Combination of sub-option 1 with a unique flat rate for indirect costs calculated on basis of direct costs as a general rule

This sub-option would build on sub-option 2a but would add as a general rule a flat rate element to the approach. **Indirect costs would be reimbursed as a single flat rate calculated on the direct costs**. In this approach, the possibility of reporting real indirect costs would be limited solely to non-profit participants with a full cost accounting system whose methodology for calculating indirect costs would have been approved ex-ante by the Commission. Thus, in addition to the simplification value of option 2a, it would reduce the frequent errors due to the indirect costs calculation since this calculation would be based either on a certified methodology or on the flat rate. For the same reason, it would also simplify and increase assurance of the certificates on the financial statements and would allow for lighter ex-post financial audits.

– impact of this option on the reduction of the rate of error will be thoroughly analysed in the Financial Statement accompanying the Framework Programmes and therefore is not included in the report.

Concerning Euratom the above changes would be relevant for the rules stipulating participation in the Fission actions, but not for the Fusion activities, due to their specificities already explained.

5. ASSESSMENT OF THE IMPACTS OF THE OPTIONS

5.1. Scope of the rules

5.1.1. Policy implications of harmonisation

JTIs and Article 185 TFEU initiatives: Policy option A1 for JTIs would follow the approach of "no one-size-fits-all", which was considered appropriate for the FP7 JTIs[43]. A separate setting would be foreseen also for potential future JTIs, with the aim of integrating industrial research using tailor-made rules mirroring the working practices of the industrial research areas to be integrated. The option implies that the applicable rules for participation would be defined for the initiatives in question through Council Regulations, and complemented by the subsequent decisions of the JTI JU Governing Boards. An important effort, with uncertain results[44], would be needed if coherence of rules is to be attained in this scenario. This option is likely to satisfy the main industrial beneficiaries of the JTIs funds, in combination with the successful completion of other preparatory work on the precise architecture for future EU-level PPPs in research[45]. At the same time other beneficiaries would be discontented with persisting discrepancy in content and interpretation of rules for participation depending on the instrument.

Concerning Article 185 TFEU initiatives, policy option A1 would also confirm the approach considered appropriate for the current Article 185 initiatives and that was based on the topping up of national programmes with EU funds, in agreement with the Member States concerned, whereby the Article 185 initiatives could abide, to a certain extent, by the rules applicable to the jointly implemented national

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43 See SEC(2007)692 of 15.05.2007: "a "one-size-fits all" approach is not appropriate due the specific characteristics of each JTI in terms of nature of the technological challenges addressed, the stakeholders involved and the financial engineering needs."

44 It is indeed difficult to guarantee coherence among legislative acts which are the outcome of different procedures, one for each Council Regulation, each taking place in its own context. However it should not be excluded that a certain degree of coherence of rules can be achieved through a pronounced coordination effort outside the rules of participation.

45 See e.g. EC proposal on a new Financial Regulation, COM(2010)815.

programmes. The option implies that it would be the decisions of the European Parliament and the Council setting up the Article 185 initiatives, as complemented by the subsequent agreements between the Commission and the Dedicated Implementation Structures, which would define the rules for participation for the initiatives in question[46]. This option would allow a great deal of flexibility in shaping the detailed rules of these essentially national initiatives.

Policy option A2 would reduce the complexity of the rules applicable, thus delivering simplification to the stakeholders. However, an extensive harmonization of the rules applicable to such potential future initiatives might lead to lack of flexibility. Additionally for the JTIs, it could discourage industry buy-in and ultimately participation. This effect would be largely mitigated by applying various other measures provided for under option B2. Concerning Article 185 TFEU initiatives, an extensive harmonization of the rules applicable to them might also lead to lack of flexibility and could discourage Member States from agreeing to EU participation. Therefore, the possibility for JTI JUs and for Article 185 TFEU initiatives to apply additional rules or duly justified derogations has to be envisaged also under this option.

A certain disadvantage of this approach would be that it does not address the problem of having different regulations, which create difficulties, confusion and uncertainty for participants and stakeholders with regard to the applicable law and procedures.

Competitiveness and Innovation Framework Programme (CIP): Policy option A1 for the CIP would mean applying the revised Financial Regulation with its Implementing Rules along with specific provisions on participation and dissemination as stipulated in the legislative act setting up its actions.

Policy option A2 introducing a harmonised approach would on the other hand represent a simplification for beneficiaries, particularly those who currently participate in both CIP and FP7 actions. It would also reduce unnecessary duplication of efforts for customisation of IT tools, documents, etc on the side of the Commission. Another advantage would be that Horizon 2020 rules would be more widely known because applied by a higher number of beneficiaries and the expert support on their interpretation would be widely available.

The main concern is that too detailed rules might limit the flexibility currently enjoyed by CIP. This could affect the implementation of innovation actions due to their difference from research projects, e.g. with regard to their size, duration and target audience. The solution of this problem could be to set up more general and flexible rules as proposed under option A2 regarding the scope of the future rules for participations and eventually specific derogations where truly needed

In line with CIP objectives, the rules should also be SME-friendly. This could be better achieved under option A2 if the standard co-funding rate currently applied to SME participation for research activities would be kept. Different funding rates in the same project, depending on the status of each partner (SME, big company, etc.) as envisaged in option A1, could be avoided.

European Institute of Innovation and Technology (EIT): Under option A1 the EIT would retain its specific operating rules and flexibility as defined in its Regulation. Because, by its very nature, composition and objectives, the EIT must remain flexible, option A1 would appear to be fit for the purpose of the EIT. According to the legislative act setting up the EIT, each Knowledge and Innovation Community (KIC) must have its own legal structure to reflect its specific objectives, range of partners and potential markets, while remaining open to new partners. The EIT KICs cannot fit into a "single entry point" for funding, toolkits and IT resources as defined in the current rules for participation of the Framework Programme. The current EIT regulation foresees three KICs and under the next MFF, an absolute maximum of 8-10 KICs could be envisaged. With a limited number of additional KICs, an added value of streamlining and harmonization of

[46] This option does not preclude the Commission and Member States from achieving a certain degree of coherence of rules though a pronounced coordination effort outside the rules of participation.

EIT rules and operational structures would appear limited and excessive harmonisation might even be perceived as a barrier to effectiveness and efficiency.

Simplification and flexibility in operations and disbursement of funds have been a defining characteristic of the initial success of the EIT, fully endorsed by the education, research and business stakeholders who participated in the open public consultation on the EIT and those who currently participate in the KICs.

Option A2 would also be acceptable provided it foresees for the necessary flexibility.

As previously indicated, simplification and flexibility in operations and disbursement of funds have been a defining characteristic of the initial success of the EIT. KICs need freedom to experiment new approaches with a view to delivering innovation and education breakthroughs. The current flexible and minimal rules concerning participation, submission and evaluation of the KICs, decided by the EIT Governing Board, have allowed for fast-track decisions. Such flexibility and simplicity of rules should, where appropriate, also be kept for EIT in the single set of rules established for Horizon 2020.

5.1.2. Level of stakeholder support for policy options

The current discrepancy of rules has led to complaints expressed by several stakeholders. In the case of JTIs, they perceived some tailor-made rules as detrimental to their interests[47]. In particular:

- in IMI JU, the interim evaluation report highlights the need to adequately address the issue of IPR and the reimbursement of indirect costs[48].
- in FCH JU, the (non-FP7) funding levels resulted in a level of participation considerably below initial expectations[49].

Concerning Article 185 TFEU initiatives, the implementation of the first Article 185 initiatives also points to the need for such harmonization, as reported in the second Van Velzen report on EDCTP[50] and in the interim evaluations of two FP7 initiatives[51]. With regard to the rules on national funds, a certain harmonization could contribute in particular:

- to a clearer initial agreement on a binding global envelope, which could then be complemented by annual agreements;
- to a common approach to be followed in the case of exhaustion of national funds.

Also the stakeholders' and beneficiaries' consulted through the Green Paper and workshops carried out during the Impact Assessment found the use of different sets of rules burdensome and made clear that a unique and simpler common set of rules is necessary. This position was also shared by direct beneficiaries of CIP funds. A dedicated consultation focused on these beneficiaries confirmed their views on the need to increase coordination and coherence with other EU instruments, in particular the Framework Programme

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47 See MEP question E-5826/2010: "It is argued that JTIs are led by the industry and too closed to participation by universities and SMEs. …".

48 According to the expert report on IMI, p. 17, recommendation 1.2: "Universities, Research Organisations and SMEs have concerns with the implementation of the IMI Intellectual Property Policy. The IMI JU should (…) address specific issues arising in negotiations of intellectual property issues (…) It is also necessary to adequately address the problem created by the current financial policy for the reimbursement of indirect costs as this may jeopardise academic participation in IMI."

49 See recital no 3 of the draft Commission Proposal for a Council Regulation amending Council Regulation (EC) No 521/2008 of 30 May 2008 setting up the Fuel Cells and Hydrogen Joint Undertaking.

50 According to the second Van Velzen report on EDCTP, p. 8: "The Commission should (…) request that the co-funding rules be made simpler, open and transparent."

51 According to the expert report on AAL, p. 39-40, there is "limited evidence yet of well developed financial integration across all countries" and "lack of standardised rules". See also recommendations 13 ("Harmonise financing conditions"), 14 ("Participation rules across countries should be better harmonised") and 15 ("Establish a European framework for project management"). According to the expert report on Eurostars, p. 5, there is "scope to further improve the harmonisation and synchronisation of the national procedures …"

for research and technological development, in order to create synergies and avoid duplication. Certain stakeholders also acknowledged the need for tailor-made solutions for specific actors, potentially attained by an enhanced flexibility of the rules. Therefore there is abundant evidence that **the participants in research and innovation actions are strongly favouring policy option A2**

This is also the view shared by the legislators. Council Conclusions of 26 November 2010 stressed that. "*Fragmentation, duplication, complexity and lack of critical mass for achieving real breakthroughs need to be tackled urgently, notably by more efficient and less bureaucratic governance at all levels"* accentuating the need to ensure coherence and coordination between different EU policies in order to provide more efficient EU action and the need for *"maximizing value for money by tackling fragmentation and by increasing the efficiency of public spending on RDI at EU, national and regional level".* Further Council conclusions recognized the need for a critical review of the current set of programmes and instruments, as well as for the coherence of their rules to facilitate the interoperability of the instruments in different programmes (e.g. FP, Competitiveness and Innovation Framework Programme, Structural Funds) with a view to exploiting further the synergies resulting from their combined use.

Similarly, the European Parliament in its resolution on simplifying the implementation of the Research FPs recommended a reduced set of rules and common principles for funding to govern EU funding for R&D. The resolution also called for coherence and harmonisation in the implementation and interpretation of the rules and procedures across the whole FP and associated instruments and within the Commission, regardless of the entity or executive agency in charge of implementation.

A number of stakeholders opinions have however indicated particular qualities of the EIT initiative that call for enhanced flexibility.[52]

5.1.3. Administrative costs and simplification effect for participants

The policy option A1 would mean applying the revised Financial Regulation and its Implementing Rules, which could bring some simplifying effect and lead to a small reduction of administrative costs. Yet, the

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[52] *KIC InnoEnergy sees a danger in stressing the HOW rather than the WHAT. What counts ultimately as attractive for any institution and individual are two (2) things: the output and a good return on investment. (…) In KIC InnoEnergy* we *do not believe in a unique set of rules. (cf.* KIC InnoEnergy response to the Open consultation on the Common Strategic Framework*).*
The current EIT appears to be awarded a significant degree of autonomy to organise their partnerships and flexibility to respond to their particular thematic are. This is essential given the desire to be reactive to widely different industrial and societal needs (cf. Rolls- Royce response to the OPC on the EIT).
The specific role and autonomy of EIT should be maintained within the CSFRI, as it encompasses vital aspects of the research, education and innovation landscape. EIT should be a part of the CSFRI while maintaining a strong link to the European Higher Education Area (EHEA). The EIT's regulation allows for significant autonomy, which should be maintained and strengthened, so that the demands of high pace innovation can be adequately addressed. The EIT's operations should remain flexible and simple. Efforts should be made to incorporate the regulation applying to EIT in a future streamlined CSFRI regulatory framework. However, preserving the current flexibility and innovativeness must be made a priority. (SE Government response to the open consultation on the EIT)
(…)A balance will have to be found for the European Institute of Innovation and Technology (EIT) between much needed flexibility and freedom on the one hand and its alignment within a common framework on the other hand..(…) Recommendations:
(…) Align the EIT with the requirements of a common framework in a flexible manner.
(…) A balance will therefore have to be found between the EIT's need to retain enough flexibility to address distinct needs whilst ensuring alignment with other elements based within a common framework.
(cf. LERU LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES response to the OPC on the CSF)
A high –trust and business-like approach is a condition sine qua non to bring about systemic impact (3TU Federation response to the EIT open consultation which involves the Delft University, Eindhoven University and university of Twente).

administrative burden resulting from the application of different sets of rules would nevertheless remain unchanged

Policy option A2 would allow significant reduction in the burden for coordinators. The impact of adapting to a new set of rules is clearly visible from the results of the survey on administrative costs of FP7 participants. Aggregated data on amount of time spend during the entire life of the project shows clear differences between new and experienced coordinators (there is no significant difference for partners and rather limited one for mono-beneficiaries). The median number of person-days spent varies from 184 days for experienced coordinators (already participating in the FP7) to 207 days for coordinators who participated in the previous FP and 205 days for newcomers (11,4% difference between experienced coordinators and newcomers)[5354].

Concerning the CIP the option A2 combined with the preferred option identified with regard to scope of the rules (see Point 5.3) would be a real simplification having the potential to allow beneficiaries to base themselves on a single reimbursement system, thus reducing errors in their cost declarations. Concerning ICT PCP part of CIP some actions are funded mainly via lump sum (scale of unit costs), while other are already funded via reimbursement of eligible costs applying a single funding rate (of 50% or 80% depending on instrument) for all beneficiaries is set. Also a single flat rate for indirect costs is defined for certain actions (pilot projects).

Also the extension of the Guarantee Fund would reduce costs for beneficiaries and improve sound financial management of the programme. Recent study of DG ENTR on administrative costs of participants in Entrepreneurship and Innovation Programme (EIP) indicated that considering a bank guarantee worth € 100,000 to remain in force for two years, financial costs can easily reach the level of € 4,000 – 5,000. To this one must add the processing fee, which may range from as little as € 50 to more the € 500, depending upon the bank[55]. These savings would apply to private entities only (including not-for profit organizations), as public sector applicants are exempted from providing bank guarantees[56] For CIP a systematic verification of the financial capacity of applicants has to be carried out due to the absence of guarantee fund while example of ICT PCP actions shows that an average EU funding per participant amounts approximately 140.000 EUR (in FP7 no verification of the financial capacity is necessary for beneficiaries requesting less than 500.000 EUR). Such verification adds to the complexity and length of the negotiation phase. Also the participants in FP7 have indicated that administrative effort of verification was on average 2 working days[57].

The data gathered for EIP show that current administrative costs are comparable to that of FP7 projects indicated in Annex I. From division of administrative cost it can be concluded that also impact of changed scope of rules analysed in point 5.2.3 would be only slightly lower in case of CIP.

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53 Some additional costs initially not envisaged in the questionnaire were reported by certain percentage of beneficiaries. When applying weights to these cost and adding them to the numbers presented above, these become 189, 213 and 213 days respectively.. Presuming that such additional costs would be borne by all coordinators including the ones who did not report them, the numbers would raise respectively to 213 for experienced coordinators, 238 for coordinators who participated in the previous FP and 251 days for newcomers (17,8% difference between experienced coordinators and newcomers). See annex I, Point 7.5

54 These numbers do not take into account the recurrent character of certain activities throughout the project lifecycle, namely project administrative management, including horizontal issues, such as ethics, gender or dissemination activities, and reporting. For that reason, the actual number of person-days spent per participant is actually higher, and e.g. for typical 'Small scale Collaborative project' with duration of 3 years and two periodic reports the administrative cost of average coordinator is 270 days (277 with weighted additional costs)

55 It is however necessary to remark that e.g. for CIP ICT PSP DG INFSO has requested in total only four bank guarantees covering a total amount of 471 297 EUR.

56 Report on online survey on the cost for beneficiaries of grants and the cost for financial intermediaries for financial instruments of the Entrepreneurship and Innovation Programme (EIP)

57 See annex I, point 3.1.2

Table 2: Staff Time Devoted to Various Activities (Staff-days) (Source DG ENTR[58])

		Application	Contracting	Impl. - One-off	Impl. - Recurrent	Audit & Evaluation	Total
Network Grants	Lead/sole applicants	38.8	8.2	20.2	170.0	24.6	261.8
	Consortium partners	24.9	6.4	11.3	86.4	9.9	138.9
	Overall average	**26.8**	**7.6**	**15.0**	**100.2**	**16.3**	**165.9**
Eco-Innovation Grants	**Overall average**	**35.8**	**13.1**	**14.7**	**121.8**	**n.a.**	**185.4**
Other Grants	Lead/sole applicants	31.4	8.2	9.6	137.7	30.3	217.1
	Consortium partners	9.3	6.3	11.0	58.5	6.3	91.3
	Overall average	**27.9**	**7.6**	**10.5**	**105.9**	**19.8**	**171.7**
SMEG ()	**Overall average**	**35.0**		**24.2**	**168.8**	**11.5**	**239.5**
GIF	**Overall average**	**20.0**		**10.0**	**40.0**	**n.a.**	**70.0**

5.2. Content of the rules

5.2.1. Implications of modifications of the legal framework defined by the rules for participation and dissemination

Regarding this policy issue, the assessment will focus on whether introducing the changes in the content of the rules as described above would help to achieve the objectives of the Horizon 2020

Pre-commercial procurement (PCP) is defined as the procurement of R&D services enabling public authorities to find solutions to address challenges of public interest for which no commercially stable solutions exist. PCP may only finance original development of small scale test series and can not cover deployment or commercial development type activities. As a mechanism of approaching the research results to market envisaging its use for specific areas (like e.g. border security condition or areas with combined EU/Member States responsibility, as the CO2 trading scheme), it would lead to innovative solutions that could subsequently be commercialised on a larger scale. Public procurement of innovative solutions is a step forward from PCP, providing funding for public procurers to encourage them to purchase innovative product/service already developed. Together these two instruments would provide a supplementary system and allow supporting transfer of research result to the market. Prizes for researchers proved their motivating value in research (example being the EU Descartes Prize for Collaborative, Transnational Research, and new type of induction prizes would lead to mobilisation of funds for research many times as large as an amount of prize (as can be seen on examples of many such initiatives world wide e.g. X Prize Foundation initiatives or US government DARPA Grand Challenge aiming for developing driverless vehicles). Therefore all these measures would contribute to expanding the innovative potential of future Framework Programmes.

Regarding **international cooperation**, the adoption of a more differentiated approach to cooperation with third countries will address both identified problems, namely the large proportion of the EU funding going to emerging economies as well as the general inadequate scale and scope in EU international cooperation activities in particular with key industrialised countries and emerging economies.

The proposed new approach and related changes to the Rules for Participation would be expected to increase the overall level of internationally orientated STI cooperation relative to the "business as usual option" (where a pro rata level of international cooperation as compared with FP7 and the effective decline of EU contribution against rapidly increasing levels of international cooperation by Europe's strategic competitors). This would be achieved through a clarification of the conditions under which such cooperation is undertaken, provision of greater focus, enlargement of the scope and flexibility for the Commission to conduct joint/coordinated calls with third countries and potential for closer alignment of

58 Op. cit.

research agendas with strategic international research partners (and, at the same time, to increase the potential for reciprocal funding opportunities).

Regarding the modification of the **rules on exploitation and dissemination** improving but without radically changing these rules will allow better exploitation and dissemination, generalising the principle of open access to research publications and envisaging experimenting with open access to results of research funded by the Framework Programmes in appropriate areas will help spur new innovation, while providing access rights to the results for the European Union and its bodies will ensure better targeted, implemented and monitored programmes.

Regarding **the scope of the guarantee fund**, it seems appropriate to extend it to other activities that cannot currently participate in the FP7 GF as they are not subject to the FP7 rules for participation, as JTIs, Article 185 Initiatives, the CIP and the EIT actions that will be incorporated into the Horizon 2020. As these actions will be financed by the EU to a large extent and as the nature and structure of the participants to these instruments is largely congruent with the participant population in traditional FP7 actions, the same protection level should be ensured.

Regarding the **main funding model**, the assessment of the presented options is strictly related to the issues of administrative costs and simplification effect for participants and, at the same time, to the costs of implementation for the Commission. Given its political relevance and its complexity, it will be extensively analysed in the relevant point, taking separately into consideration the impact of the envisaged measures on administrative costs for participants and on implementation costs for the Commission. The beneficial impact of the presented options on **error rate** in implementation of the Framework Programme will be analysed in the Financial Statement accompanying the Horizon 2020.

5.2.2. Level of stakeholder support for policy options

There is an overall consensus among stakeholders on the fact that relevant changes are to be implemented in the rules in order to simplify the participation and management for the beneficiaries of research grants and to reduce the associated administrative burden. Calls for a better balance between risk and trust and for a wider acceptance of usual accounting practices are nearly unanimous. In this context, a business-as-usual approach would be very negatively perceived. This view was also shared by the Council in its conclusions of 26 November 2010 which inter alia acknowledged importance of *"simplifying and streamlining urgently European programmes and procedures in RDI"* and *"taking action to ease access to finance for RDI purposes by companies, especially SMEs"*. The Council identified simplification as a key issue for the forthcoming research and innovation programmes and as a crucial and urgent necessity to overcome the current complexity of the funding rules leading to excessive administrative burden and discouraging potential beneficiaries. The conclusions of the Council also stated that the simplification process must be ambitious while pursuing stability, consistency and legal certainty. These recommendations were equally shared by the European Parliament.

Simplification is however very differently understood depending on the specificities of the stakeholders. Concerning in particular the main funding system, there is an evident preference for a continuity of the cost reimbursement method (options B2a and B2c) provided that stability and legal certainty are improved compared to FP7. Yet, there is no overwhelming majority of voices for any particular option. For instance Option B2b, output based grants, gets some very positive views among individual researchers and SMEs but it is quite strongly opposed by part of the institutional participants. Overall it receives a limited support from stakeholders with a vast majority expressing serious doubts about its systematic use. This reserved view is shared by the European Parliament. Similarly, a number of stakeholders perceive the use of flat rates as a clear simplification element, while others are concerned about the impact on the level of the EU financial contribution to costs of the project and would prefer claiming actual cost.

Council Conclusions of 3 December 2009 invited the Commission, together with Member States where relevant, to pursue vigorously further reduction of the administrative burden.

Regarding the introduction of pre-commercial public procurement and public procurement of innovative solutions, the public consultation has revealed lack of awareness with regard to the topic. The reactions received came mainly from industry (around one third), recognizing the large, untapped potential of the public sector purchasing power to drive innovation and stimulate private R&D, and highlighting that pre-commercial procurement can be a powerful tool for driving innovation. The subject was recognised by the Council asking Commission for *"making a strategic use of public (including pre-commercial) procurement for innovative products and services"*. Opinions concerning inducement prizes were rather mixed with equal (and rather small) number of partisans and opponents.

Concerning international cooperation the view of the stakeholders point to protection of EU interests, need for a strategic approach based on reciprocity and focusing more on addressing the global problems and common strategic interests of EU. The European Parliament in its resolution recommended further internationalisation of the future FPs through cooperation with third countries, including developing countries, providing them with simple and specific management rules. Also the Council perceives *"scientific and research cooperation with third countries as a matter of common concern"*. These concerns are taken into account in the second policy option.

Improvement of the rules on exploitation and dissemination without radical changes has gained a common acceptance of stakeholders. Introducing the principle of open access to research publications as a general approach was widely welcomed. Quality of current rules and value of stability were recurrent in the opinions received.

From this feedback it can be concluded that **the measures envisaged in the second option would align better with the preferences of the actors directly concerned** by the content and implementation of the rules for participation and dissemination.

5.2.3. Administrative costs and simplification effect for participants

– **Costs and benefits of policy option B1 "Business-as-usual"- Keeping the** keeping the same content for the Horizon 2020 rules for participation and dissemination

Keeping the current cost reimbursement system unchanged would simply **ignore the repeated calls for simplification** issued by the Council, the Parliament and stakeholders in EU funded research. In this context, **this option should be discarded for the** Horizon 2020 Framework Programme and serve only as **baseline scenario** for assessing the administrative costs reduction potential of the other options.

The online survey of FP7 beneficiaries has gathered a significant number of data (3.900 responses) on the administrative efforts associated with participating in an EU funded research project. Median values have been calculated for working time associated with all the tasks and processes carried out across the project life cycle. These median values are available for the different types of participants in the different types of projects. By applying the Standard Cost Model methodology, it is then possible to estimate the participation costs under the FP7 (see annex I). It has to be highlighted that these participation costs do not consist only of "information requirements" or purely administrative tasks (form filling, financial accounting, etc). They represent the overall effort of the beneficiaries, i.e they **include also tasks such as developing the scientific-technical content of a proposal, adapting this content during the negotiation phase, managing the consortium or dealing with scientific reporting, ethics, gender, dissemination and stakeholders involvement at project implementation phase.**

Based on the figures gathered in the survey among FP7 beneficiaries, and applying the Standard Cost Model, estimates on the administrative costs for participating in a set of typical average FP7 model projects were made (see annex I). For example, in a typical 3-year **collaborative research project**, receiving an EU contribution of € 3.000.000, the financial effort related to participation (administrative and content-oriented tasks of the beneficiaries) is in the order of € 277.000 for the whole consortium of 9 partners. The table at right summarizes such estimates associated with participation for a set of 5 "typical **average FP7 projects**". It is to be mentioned that part of the costs incurred during the project implementation phase are eligible for

reimbursement by the EU grant. Without a change in the rules, one may consider that these figures would not substantially change in the future programme.

1. Small-scale Collaborative project (9 partners)	€ 277.000
2. Large-scale Collaborative project (20 partners)	€ 885.000
3. SMEs project (9 partners)	€ 303.000
4. Marie Curie Individual Fellowship (1 partner)	€ 18.000
5. ERC grant (monobeneficiary) (1 partner)	€ 36.000

The above analysis also applies to Fission indirect actions. Administrative cost of the Fusion activities was assessed in the specific survey, the results of which are presented in Annex Vb.

– **Cost and benefits of policy option B2 "Modifying the Rules for participation and dissemination for the future Framework Programmes"**

Introduction of mechanism for funding the pre-commercial public procurement and public procurement of innovative solutions would have limited impact on simplification. The two forms differ from the general model of public procurement provided for in the Financial Regulation and also differ from each other. The relatively small rate of replies to consultation shows that the knowledge of these mechanisms (notwithstanding its innovative potential) might be limited and that an learning effort would be required for many participants adding to their administrative costs. Prizes on the other hand would be a rather simple instrument with very few requirements to abide by.

Regarding the ***adaptation of the Rules for Participation in relation to international cooperation***, it would have a simplification impact for participants in joint calls with third countries' funding agencies for example through, a single set of conditions and a single joint evaluation in addition to the coordinated projects, as they are currently practised under the FP7 rules for participation. The introduction of the possibility for EU financial contributions to programmes managed by international organisations or by third countries will also facilitate the participation of EU entities in such programmes.

Regarding the ***modification of the rules on exploitation and dissemination,*** generalising the principle of open access to research publications would have no relevant impact on participants in terms of administrative burden.

Regarding the ***extension of the guarantee fund (GF)***, the financial risk of extending the current GF to the instruments mentioned above cannot be quantified at this point in time since it will depend on the apportionment of budget to the different funding schemes under the Horizon 2020, specifically concerning the funding schemes for SMEs. However, as the population of participants in the instruments in question does not represent major differences to the population of traditional research project participants, the increase of the financial risk should be minimal and covered by the additional contributions received from the instruments. The administrative costs of this exercise are not quantifiable at this point in time.

As regards the ***main funding model***, the analysis will be carried out taking into account the three proposed sub-options.

Sub-option B2a – Simplified cost-based funding (with simplified cost eligibility criteria and single reimbursement rate per project: under this approach, getting acquainted with the financing rules and applying these rules when preparing or negotiating proposals would be easier, requiring less effort from the beneficiaries. The same would apply for managing the financial aspects of the running projects, reporting and certifying the costs, and in case of ex-post auditing.

Sub-option B2b – Output/results based funding: this sub-option would largely decrease the need for detailed administrative and financial interaction with Commission services during the implementation of the projects. In contrast, the scientific and technical follow-up would be more demanding during the negotiation and the implementation phases. However, time-to-grant could be affected negatively, because of the more complex and detailed negotiations for fixing project-specific lump sums and the measurable output against which they would be paid. Moreover, the focus on output may become a disincentive to high-risk high-gain proposals for which the potential output cannot be specified and guaranteed ex-ante.

Sub-option B2c – Simplified cost-based funding as in sub-option B2a, combined with a flat rate on direct costs for indirect costs as a general rule: with this approach the benefits and savings from sub-option B2a would be further enhanced since administrative efforts and uncertainties linked to the calculation and reporting of indirect costs would be reduced.

The impact, on monetary terms, of the three options has been estimated taking into account the expected effect of the option on each process step. The resulting figures, expressed as differentials from the baseline scenario (business as usual) are summarized as follows (with percentage indicating reduction of administrative cost)[59]:

	Option B1 (baseline)	**Option B2**					
		Option B2a		***Option B2b***		***Option B2c***	
Small-scale Collaborative project (9 partners)	277.000	249.000	*-10%*	208.000	*-25%*	232.000	*-16%*
Large-scale Collaborative project (20 partners)	885.000	777.000	*-12%*	588.000	*-34%*	699.000	*-21%*
SMEs project (9 partners)	303.000	265.000	*-13%*	205.000	*-32%*	257.000	*-15%*
Marie Curie Individual Fellowship (1 partner)	18.000	18.000	*0%*	18.000	*0%*	18.000	*0%*
ERC grant (mono-beneficiary) (1 partner)	36.000	32.000	*-11%*	22.000	*-39%*	29.000	*-19%*

Amounts in expressed in Euros

5.2.4. Costs of implementation for the Commission

The costs associated to the options presented in this analysis can be found in the Commission's communication "More or less controls? Striking the right balance between the administrative costs of control and the risk of error"[60]. The methodology explained below was agreed upon and used to guarantee the coherence of data throughout the services. As per that established methodology, the **cost of implementation of the Framework Programmes in the Research policy group totalled around €267 million annually.**

The table below summarizes the total cost (in full time equivalents and in million Euros) of implementation of the FPs in 2009 for the Research family DGs and four executive agencies, as well as the impact of the three sub-options for main funding model that are analysed.

RESEARCH family DGs	**Baseline Scenario**		**Sub-option B2a**		**Sub-option B2b**		**Sub-option B2c**	
Project stage	**EC Officials & External Staff (FTE)**		**Variation (%)**	**Amount (M€)**	**Variation (%)**	**Amount (M€)**	**Variation (%)**	**Amount (M€)**
Selection of proposals	474	46,4 M€	No Change	46,4	+ (12,08%)	52,0	No Change	46,4
Negotiation of contracts	439	42,1 M€	- (5,00%)	40,0	+ (9,17%)	46,0	- (5,42%)	39,9
Project management	1.136	113,4 M€	- (2,50%)	110,6	- (26,25%)	83,6	- (3,75%)	109,1
Ex-post (audits & results)	187	36,8 M€	- (4,58%)	35,1	- (6,25%)	34,5	- (7,50%)	34,0
Subtotal	**2.236**	**238,7 M€**	**- (2,78%)**	**232,1**	**- (9,47%)**	**216,1**	**- (3,89%)**	**229,4**
Additional resources		2,7 M€	**Diff.**	**- 6,6 M€**	**Diff.**	**- 22,6 M€**	**Diff.**	**- 9,3 M€**
Outsourced audits		11,4 M€						
Certification		14,9 M€						
Total	**2.236**	**267,7 M€**						

This **cost of implementation** was built up by assessing the full-time equivalents (FTE) allocated to the stages of the project cycle. Each DG assessed the percentage of work-time spent by its staff on control tasks

[59] As the elements of the 'business-as-usual' costs depend on the beneficiary, it is impossible to deduct them from overall cost, therefore the administrative burden is only part of the cost indicated and its reduction is in fact significantly higher

[60] (COM(2010)261), op. cit.

(selection of proposals, negotiation of contracts, project management, ex-post audits and implementation of results from ex-post audits). The results were then multiplied by an annual average cost per category (€122.000 for Commission officials and €64.000 for external agents), thus reaching a total cost for human resources. An important advantage of this methodology is the inclusion of the overheads in the amounts indicated.

The data collection was based on figures for the year 2009, and for that reason the impact of the recent Commission Decision on three measures to simplify the management of EU FP7 Research grants is not taken into account in the baseline scenario.

As established on the basis of the abovementioned data, the option 1 **"business-as-usual"** amounts to **238,7 M€** in terms of cost of human resources involved (baseline scenario). Other costs like additional resources, outsourced audits and certification of financial statements will not be considered for the purpose of assessing the impact of the different options, since for the level of detail of the analysis their impact can be considered constant from year to year.

In order to analyse the impact of the different alternatives for costs reimbursement, a survey was launched internally at the Commission. A sample of officials working in the operational, financial and audit units assessed the impact in percentage terms of 3 different scenarios. The average of the assessments is shown in the column 'variation' of the table above. The following scenarios do not take into account potential increase in the funding for the Horizon 2020 Framework Programmes. Also potential benefits and cost of further externalisation are not analysed here.

The first scenario considered the introduction of a number of measures of simplification in the present way of operating. This sub-option would not affect the first stage of the project cycle but could indeed reduce the error rate and the administrative costs linked to the ex-post controls stage. The result for this type of scenario is a small reduction of approximately **2,8%** in total, leading to savings of around **6,6 M€** per year.

The second scenario considers a more profound change and shows a higher impact if we migrate from a cost-based system into a result-based system. All stages of the project cycle would be affected, increasing the costs of the selection of proposals and negotiation of contracts but reducing the costs for the Commission in what concerns the project management and the ex-post controls. Focusing on a more precise definition of results to be achieved and working with a fixed sum for contribution would alleviate the management of projects. The ex-post audits would become technical rather than financial, thus potentially reducing the effort with recoveries and extrapolation. The reduction would be approximately **9,5%** and the level of savings would be **22,6 M€** per year[61]. However, **when considering a radical change towards output-based funding as the main funding model, other aspects have to be taken into account, as** such a change would require major organisational changes in the Commission and the other implementing bodies, building up new skills and changing the distribution of professional profiles of staff..

Finally, the third scenario considers the introduction, on top of scenario 1, of a unique flat rate for the reimbursement of indirect costs. In the officials opinion, the impact would be the same as in the first option for calls for proposals and contract negotiation but higher for the two last stages. The result would be a reduction of approximately **3,9%** and savings of **9,3 M€** per year.

[61] Initial results of the study on the output-based funding carried out on the specific themes of 'Space' and 'Security' indicate that for these specific areas application of different type of 'output-based funding' namely pre-defined lump sums per project (as defined in Point 3.3 of the Communication of the Commission: "Simplifying the implementation of the Research Framework Programmes" of 29 April 2010 (COM(2010) 187)) may even lead to economies attaining 25%. However, due to limited scope of the study results are not transposable on a general basis to the whole Framework Programme.

5.3. Comparing the options

On the basis of the data presented above and annexed to this Impact Assessment, supported by a number of ex-post evaluations, studies, statistical data, workshops with experts and external stakeholders, etc., we have summarised below the expected impact of the two sets of options:

Comparative table of the impacts on the policy objectives and other decisional considerations	**Policy Options**					
	Policy issue: Scope of the rules		**Policy issue: Content of the rules**			
				Option B2: **Modifying the rules**		
	Option A1 **Business-as-usual**	Option A2 **Single set of rules**	Option B1: **Business as usual**	Option B2a ***Simplified cost-based funding***	Option B2b ***Output /result based funding***	Option B2c ***Simplified cost-based funding with indirect costs flat rate***
Policy objectives						
1.1 Simplify funding provisions	○	✓✓	○	✓	✓	✓✓
1.2 Reduce administrative burden	○	✓	○	✓	✓✓	✓
2. Harmonisation	✗✗	✓✓	✗✗	○	○	✓
3. Protection of EU against risks of participants ' errors and insolvency	○	✓	○	○/✓	○	✓
4. Impact on international cooperation	○	○	○	○/✓		
5.1 Economic impact on businesses including SMEs	○	✓	○	✓	○/✓	✓
5.2 Impact on innovation results	○	✓	○	○/✓		
Other Impacts						
Expectations of policymakers	✗✗	✓✓	✗✗	✓	✗	✓
Stakeholders´ opinion	✗✗	✓✓	✗✗	✓	✗✗	✓
Impact on cost of implementation	○	✓	○	✓	✓✓	✓
Impact on stability of rules	✓	✗	✓	✓	✗✗	✓

Symbols: (✗) negative impact; (✓) positive impact; (○) no impact, (✗✗/✓✓) significant impact

5.4. The preferred option and its advantage

As regards choices presented for **policy issue 1,** it can be concluded that **policy option A2 is considered the preferred option**.

For ***JTIs and Article 185 Initiatives***, policy option A1 would not adequately address the current complexity of both of them, and efforts towards harmonization would be scattered.

Policy option A2 would reduce the complexity of the rules, delivering simplification to the stakeholders. Possibility to apply additional rules or duly justified derogations would allow for necessary flexibility.

For ***Competitiveness and Innovation Framework Programme,*** policy option A1 would not be adequate to reach the objectives mentioned above, because it would not address the harmonisation needs pointed out by beneficiaries and would perpetrate fragmentation of the legislative framework.

Policy option A2 would be the preferred one, as it introduces a harmonised approach resulting in simplification for beneficiaries, reduction in number of IT tools and guidelines, increase in the visibility of the CIP. It also allows to apply clearly developed and coherently interpreted rules. The main concerns for this option will be addressed by making the rules more general and flexible with possibility of specific derogations. It would also present certain benefits regarding the reduction of the administrative burden.

As for the ***European Institute of Innovation and Technology***, an overwhelming majority of stakeholders have stressed the need to preserve and further enhance EIT's current levels of flexibility.

Taking these reservations into account when concerning the scope of the future rules for participation, **policy option A2 is considered a preferred option**, provided that the specific character of the implemented actions of the EIT and the typology of its beneficiaries requiring a high level of flexibility are duly taken into consideration.

As regards choices presented for **policy issue 2,** it can be concluded that **policy option B2 is considered the preferred option**.

Policy option B1 would not adequately address the current problems identified above and would be perceived by participants as incapacity of the EU to react to the needs clearly pointed out in the several consultations carried out.

Modifying the rules for participation and dissemination for the future Framework Programmes as proposed above under policy option B2 seems the option that would better achieve the proposed objectives. Focusing the attention on the politically most relevant modification proposed above, i.e. the **main funding model**, the preference for option B2 is based on the following elements:

- In financial terms, option B2b seems to offer the perspective of larger savings in administrative costs, both for beneficiaries as for the Commission, than the other options. However, these expectations are highly speculative since output based grants have been tested only on a limited scale and there is no comparative international funding programme in the area of research[62]. The risk of additional administrative burdens and bottlenecks in the management of the scheme entailing higher administrative costs needs to be accounted for in the light of the novelty of this model. Moreover, stakeholders and legislative authorities called the Commission to take prudent steps in the implementation of radically new schemes which could put at stake legal certainty for beneficiaries. Against this background, the options based on a continuity of the reimbursement of eligible costs as the main funding stream are to be favoured.

- In this context option B2c is the preferred option. It has the benefits resulting from option B2a (i.e. continuity of the main well-established scheme, large support from stakeholders, simplification of rules, etc) but also adds on the advantages of a single flat rate covering the indirect costs as a general rule. This flat rate largely reduces the long-standing problem of financial errors resulting from the calculation of indirect cost. In addition it grants beneficiaries a high degree of legal certainty on the EU contribution claimed. Furthermore, it reinforces sound financial management by the Commission and the protection of EU financial interests. The rules for participation will include, nonetheless, provisions allowing for the application of output based grants where the characteristics of the action to be carried out allow for the optimal use of this model.

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[62] The study "Evaluation of output based funding for the space and security themes" (Booz & co.) prepared for the Directorate-General Enterprise and Industry included an extensive international benchmark exercise on research funding schemes. The preliminary findings of this study showed that pure output based grants in these areas are applied on a limited scale in some programmes (e.g. NASA).

5.5. Proportionality of the preferred option

As the future rules for participation will keep a number of measures currently in force for FP7, questions of proportionality arise only in the case of the measures altering the *status quo*, i.e. the recommendations for actual changes. In that context the preferred option is fully in line with the principle of proportionality, as regards the choice of the legislative act prescribed in the TFEU as well as the content of the individual measures envisaged. This option presents particular value in achieving a careful balance between harmonisation and need for flexibility as well as the reduction of the administrative costs of the participants and the Commission and the desire of beneficiaries to keep the solutions that are working properly and they are familiar with. Above all, this option is the minimum necessary to achieve the objectives of ensuring the implementation of the Horizon 2020 and securing the innovation impact set out in the "Europe 2020" strategy. The costs imposed on participants, in particular businesses, are largely reduced and can be considered proportionate to the stated objectives

Likewise, the costs of implementation linked to the preferred option are also proportionate to the objective of effective implementation of the Horizon 2020. For each issue in the preferred option the effort was made to choose the least intrusive measures that are nevertheless in line with the Financial Regulation as well as with the specific character of research and innovation actions. They allow to achieve all identified objectives and are respondent to positions of the concerned parties and the general public.

6. MONITORING AND EVALUATION

6.1. Purpose

In order to implement the Horizon 2020 successfully and to achieve the general policy objectives and specific operational objectives set out in Chapter 3, it is vital to put in place an appropriate monitoring and evaluation system, with a focus on efficiency and effectiveness.

The system will be based on a comprehensive and harmonised strategy, with a strong focus on throughput, output and impact. It will be supported by an appropriate data archive, experts, a dedicated research activity, and increased cooperation with Member States and Associated States, and it will be valorised through appropriate dissemination and reporting.

The Horizon 2020 monitoring and evaluation system will need a clear strategic orientation in order to cover the wide range of activities in a consistent and coherent way. This orientation will be the subject of a dedicated Commission Communication.

6.2. Key principles of the Horizon 2020 monitoring and evaluation system

The key principles of the Horizon 2020 monitoring and evaluation system can be summarised as follows:

- **Comprehensive strategy**

At the beginning of the Horizon 2020, a comprehensive evaluation and monitoring strategy should be developed and agreed by all actors involved. This strategy should ensure evaluation coverage of all Horizon 2020 action lines and define a detailed timetable for specific evaluation work. The strategy should be updated and revised annually, taking into account new developments in the overall evaluation context. The adequate coverage of the operational objective mentioned in chapter 3.3 will be a central element of this approach.

- **Well-timed and focused approach**

At the overall level, two key deliverables are envisaged:

– A comprehensive **Horizon 2020 Interim Evaluation** in 2017 (3 years into the programme), with a specific focus on the Horizon 2020 implementation so far and recommendations for possible improvements. This evaluation will also provide valuable inputs to stimulate the debate on the future of EU funding programmes for research and innovation after the Horizon 2020, and is expected to contribute substantially to any forthcoming Ex-Ante Impact Assessment.

– A full-scale **Horizon 2020 Ex-Post Evaluation** will be carried out in 2023 (2 years after the end of the programme), analysing in depth the rationale, the implementation and the impact of the Horizon 2020 activities. The findings of this evaluation should be taken up, where relevant, in the management of subsequent activities.

Both overall Horizon 2020 evaluations will be carried out by groups of independent experts, using a broad evidence base provided by the Horizon 2020 evaluation and monitoring system. The findings of these evaluations will be immediately taken into account in the implementation and management of the Horizon 2020. They will also be communicated formally to the other institutions and to the stakeholder community at large in order to provide the opportunity for a broad debate on the issues addressed.

- **Broad analytical portfolio**

The following components are envisaged to support and complement the overall Horizon 2020 evaluations:

– Each of the thematic or specific components of the Horizon 2020 should be submitted to an Ex-Post Evaluation, supported by relevant studies and evidence gathering, within 2 years of its completion.

– Specific evaluation studies will be carried out by all services with management and policy responsibilities under the Horizon 2020, according to the timetable and objectives defined by the Horizon 2020 evaluation and monitoring strategy.

– Cross-cutting studies, will be set out in the Horizon 2020 evaluation and monitoring strategy, and should shed more light on issues of transversal interest for the Horizon 2020 implementation. This will be of particular relevance to the issues raised in this document.

– The Horizon 2020 evaluation and monitoring system will also be the basis for carrying out the Ex-Post Evaluation of FP7 in 2015 according to the legal requirements.

- **Harmonised key indicators**

For all of the above studies, common templates, methodologies and indicators will be adopted, as far as possible, so as to promote comparability and coherence, and to facilitate an aggregated overview.

The available data will be used to calculate a series of key indicators on the Horizon 2020 activities. Given the diversity of action lines, these indicators will cover a wide range of intermediary objectives under the overall context of the Europe 2020, Innovation Union and Horizon 2020 objectives. Main indicators can be found in the table below, other appropriate indicators may also be developed for an adequate monitoring of the objectives specified in chapter 3.

OBJECTIVE	Indicator(s)
To increase the attractiveness and accessibility of EU research and innovation	Time to Grant
	Reduction of administrative costs
To find a good balance between the need of harmonisation of the rules and the need for flexibility	Satisfaction of participants and NCPs
To ensure an appropriate and harmonised protection of the EU against risks of participants' errors and insolvency	Number of interventions of the Guarantee Fund following bankruptcies and liquidations of beneficiaries
	Relation of intervention costs to GF assets
To achieve a level of international cooperation corresponding to the strategic objectives of the EU	Number of participating non-EU researchers and legal entities
To boost innovation	Share of participating SMEs introducing innovations new to the company or the market
	Patent applications filed

- **Integrated data archive**

Experience from recent Framework Programme evaluations has clearly demonstrated the paramount importance of a comprehensive system for collecting all kind of relevant data for the evaluation and monitoring process. For FP7, CORDA provides a wide range of relevant data, which are all retrieved from the application, negotiation and reporting processes without any additional burden on the applicant. The principles of this successful approach will be used for the development of a corresponding Horizon 2020 evaluation and monitoring data archive. The main challenges consist in the need to integrate a much broader range of activities under single common IT architecture and the need to integrate additional information on outputs and outcomes.

- **Independent expert advice**

The internal efforts by the respective evaluation functions should be supported by a Reference Board of independent evaluation experts and users. This reference board should monitor the development and implementation of the Horizon 2020 evaluation strategy, and provide expert advice and strategic guidance on the further development of the system.

- **Increased cooperation with Member States and Associated States**

While networking across the Commission services involved is essential to ensure an efficient and coherent evaluation and monitoring approach, it is equally important to step up the efforts to connect with actors at national and regional level. Not only will the Horizon 2020 portfolio include a growing number of instruments for which evaluation activities at different levels should be envisaged, but there is also a growing need to put evaluation work at EU level and at national or regional level into mutual context. To this end a European Research and Innovation Evaluation Network will be created, evolving notably from the experiences gained over the last decade with the EU RTD evaluation network. This reorganisation should reflect the enlarged scope of the Horizon 2020 activities and provide the basis for a substantially increased cooperation with Member States and Horizon 2020 Associated States.

- **Dedicated research activity**

It is envisaged to launch a specific research effort in the field of Science of Research and Innovation Policy to develop innovative new evaluation methods and appropriate IT tools. The key objective of this initiative is to stimulate the development of novel methodologies for the evaluation of research and innovation activities, notably through the use of web based data and services. At the same time this activity should both deepen and widen the so far rather limited expert community in this area.

6.3. Dissemination and reporting

Transparency of the evaluation process is a key element of an overall strategy for full accountability. The Horizon 2020 evaluation and monitoring system will in particular include the following elements:

- Annual Horizon 2020 Monitoring Reports will present key data and indicators on the implementation of the Horizon 2020. These reports will essentially draw on the information available through the Horizon 2020 evaluation and monitoring data archive.
- Annual Horizon 2020 Evaluation Reports will highlight progress on the implementation of the Horizon 2020 evaluation and monitoring strategy and will present the key findings from evaluation activities recently completed, the key features of the ongoing evaluation studies, and the planning for evaluation work in the near future.
- A Horizon 2020 Evaluation and Monitoring website will present all relevant material and should develop into an active tool to stimulate the exchange on evaluation activities for research and innovation programmes across Europe.

GLOSSARY

AAL – Ambient Assisted Living Joint Programme

AC – Associated Countries

ARTEMIS – Embedded Computing Systems Joint Technology Initiative

BRIC – Brazil, Russia, India, China

CIP – Competitiveness and Innovation Framework Programme

Clean Sky – Aeronautics and Air Transport Joint Technology Initiative

CORDA – Common Research Data Warehouse

CORDIS – Community Research and Development Information Service for Science

CS – Clean Sky (Joint Undertaking)

DARPA – Defense Advanced Research Projects Agency

DG COMM – Directorate-General for Communication

DG EAC – Directorate-General for Education and Culture

DG ENTR – Directorate-General for Enterprise and Industry

DG HR – Directorate-General Human Resources and Security

DG INFSO – Directorate-General for Information Society and Media

DG RTD – Directorate-General for Research & Innovation

EC – European Commission

EFDA – European Fusion Development Agreement

EIP – Entrepreneurship and Innovation Programme

EIT – European Institute of Innovation and Technology

EMRP – European Metrology Joint Research Programme

ENIAC – Nanoeletronics Technologies 2020 Joint Technology Initiative

EPEC –European Policy Evaluation Consortium

ERA – European Research Area

ERA-NET – European Research Area Network

ERC – European Research Council

ERCEA – European Research Council Executive Agency

F4E – Fusion for Energy European Joint Undertaking

FCH – Fuel Cells and Hydrogen Joint Technology Initiative

FP7 – Seventh Framework Programme for Research and Technological Development

FTE – Full time equivalent

GDP – Gross Domestic Product

GF – Guarantee Fund

ICT – Information and Communication Technologies

ICT PSP – Information and Communication Technologies Policy Support Programme

IPR– Intellectual Property Rights

IMI – Innovative Medicines Initiative Joint Technology Initiative

JRC – Joint Research Centre

JTI – Joint Technology Initiative

JU – Joint Undertaking

KIC – Knowledge and Innovation Community

LERU – League of European Research Universities

NASA – National Aeronautics and Space Administration

NCP – National Contact Point

PCP –Pre-commercial Procurement

PPP – Public Private Partnership

REA – Research Executive Agency

RSFF – Risk Sharing Financial Facility

S&T – Science and Technology

SME – Small and Medium Enterprise

TFEU – Treaty on the Functioning of the European Union

TTG – Time-to-grant

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COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

{COM(2011) 808 final}
{SEC(2011) 1428 final}

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Disclaimer: this report commits only the Commission's services involved in its preparation and does not prejudge the final form of any decision to be taken by the Commission.

1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Introduction

This Staff Working Document presents in full the impact assessment of the Commission's proposals on "Horizon 2020", the Framework Programme for Research and Innovation and covers the ex ante evaluation required for every new EU expenditure programme. The report thus pertains to: the Horizon 2020 Framework Programme for Research and Innovation in the European Union (2014-2020) and the specific programme implementing it, which have their legal bases in the Treaty on the Functioning of the European Union; the European Atomic Energy Community Programme (2014-2018) complementing Horizon 2020, which has its legal basis in the Euratom Treaty; and the Commission Communication providing the overall political narrative and background to these legislative proposals. A separate Staff Working Document deals with the impact assessment of the Commission's proposals for the Rules for Participation of Horizon 2020. The Rules for Participation define the rights and obligations of legal entities intending to take part in the Horizon 2020 actions and establish the principles for the exploitation and dissemination of the results of these actions. The Rules therefore offer important avenues for simplification, and it was decided to prepare a separate impact assessment for this issue in view of the importance attached to it by the Commission and external stakeholders.

"Horizon 2020", the Framework Programme for Research and Innovation, brings together the successor of the 7th Framework Programme for Research, the successor to the Competitiveness and Innovation Framework Programme (CIP, comprising the innovation-related parts of the Entrepreneurship and Innovation Programme (EIP), the Information Communication Technologies Policy Support Programme (ICT-PSP), and the Intelligent Energy Europe Programme (IEE)), and the European Institute of Innovation and Technology (EIT). The decision to bring together all EU research and innovation funding in a coherent, from-research-to-innovation overarching framework was taken on 29 June 2011 by the College in order to make participation easier, increase scientific and economic impact, and maximise value for money. This Impact Assessment accompanies the Horizon 2020 proposals and attempts to assess their expected impacts on Europe's economy and society. The information is organised in six chapters which follow the Commission's Impact Assessment Guidelines.

In accordance with feedback received from the Impact Assessment Board, the report was revised in the following ways. The intervention logic was clarified by redrafting the problem definition and linking it more clearly to the lessons learned from the past; reducing the number of operational objectives, making them more concrete, and formulating suitable accompanying performance indicators; and clarifying the contribution of different Horizon 2020 instruments, in particular the innovative financial instruments. The differences between the policy options were explained in more detail. The report was also revised to provide more detail on the cost-effectiveness of the various options. The impacts of the 46 percent (2011 constant prices) budget increase in EU research and innovation funding proposed by the Multi-annual Financial Framework Communication were more fully analysed. More details were provided on the implementation of the preferred Horizon 2020 policy option: the rationale was explained behind the identification of the three priorities and the six societal challenges, the analysis of the funds allocation under Horizon 2020 was improved, and more details were provided on the funding schemes to be used under Horizon 2020.

1.2. Organisation and timing

The Commission's Directorate-General for Research and Innovation is the lead DG for this initiative.

Along with the Secretariat General and DG RTD, the following Directorates-General participated in the inter-service Impact Assessment Steering Group (IASG): DG EAC, DG ENER, DG ENTR, DG ENV, DG INFSO, DG JRC, DG MOVE. At both central and decentralised level, the expertise and inputs of other Commission services (among which DG AGRI, DG BUDG, DG ECFIN, DG EMPL, DG ESTAT, DG REGIO, DG SANCO and the Legal Service) was also drawn upon. Several strategic orientation meetings were held at the level of the Directors General of the Research and Innovation Family DGs as well as with the Directors General of the so-called Policy DGs. Finally, the draft IA report was pre-screened by both Commission internal as well as external experts in the area of EU policy evaluation, impact assessment, research and innovation.

Preparation of the Horizon 2020 Impact Assessment involved the following procedural steps in the past twelve months:

- Developing a Roadmap describing the process (2010);
- Setting up an inter-service Impact Assessment Steering Group to oversee the process (2010-2011);
- Consultation of stakeholders and interested parties through a variety of methods (2009-2011);
- Carrying out the IA analysis making extensive use of quantitative and qualitative evidence (2010-2011);
- Presenting the findings to a wide constituency of Commission DGs (IASG, Research & Innovation Family DGs, User DGs) as well as external experts (2011);
- Submitting the Horizon 2020 IA report to the IAB (IAB opinion scheduled for September 2011).

1.3. Consultation and expertise

Early discussions on the future of EU research and innovation funding

Discussions on the future of EU research and innovation funding started two years into the current programming cycle. Some early views relating to future research and innovation funding were included in the 2009/2010 interim evaluations of CIP (EC, 2010), the FP6 ex-post evaluation report (Rietschel et al., 2009) and the FP7 interim evaluation (Annerberg et al., 2010). The external experts involved in these evaluation studies identified achieving excellence in research, the importance of innovation for competitiveness, and the role of research and innovation in tackling societal challenges such as aging, energy dependence, climate change etc. as key themes for any future EU research and innovation funding programme.

Several forward-looking conferences were organised by the various EU presidencies (for example, the Swedish Presidency in July 2009; the Hungarian Presidency in February 2011). In 2011, two major stakeholder conferences were organised in Brussels. The first one was held on 25 January 2011 entitled "Ready to Grow? Shaping future EU support for business", attended by over 550 participants (among those were innovation agencies, industries, universities, NGOs, intermediary associations). The second conference on the Framework Programme for Research and Innovation Funding was held on 10 June 2011. The conference concluded the public consultation on the Green Paper (see below) and was attended by over 650 participants from Europe's research and innovation community.

Throughout 2010 and in anticipation of the debate on the Multi-annual Financial Framework and the related future funding programmes, a wide range of stakeholders published position papers on the future of EU research and innovation funding. This included Member States and Associated Countries, regional governments, national research councils and a number of European representative organisations.

Different ways employed to consult stakeholders and interested parties

- ✓ Public consultation on Green Paper describing the Common Strategic Framework for Research and Innovation
- ✓ Public consultation on the successor to the Competitiveness and Innovation Framework Programme (CIP)
- ✓ FP6 ex-post evaluation (chair Ernst Rietschel) with view on future, February 2009
- ✓ FP7 interim evaluation (chair Rolf Annerberg), November 2010
- ✓ CIP: interim and final evaluations, ex-ante evaluations and impact assessment studies for the ICT-PSP, IEE and innovation-related parts of the EIP programme
- ✓ Large stakeholder conferences for successor of CIP (Jan 2011) and CSF (June 2011) held in Brussels
- ✓ Expert Panels and Stakeholder Conferences for ERC, Marie Curie, EIT, …
- ✓ EU Presidencies: Lund conference on future of EU research (Sweden, July 2009); FP7 interim evaluation conference (Hungary, February 2011)
- ✓ Wide range of position papers on future EU research and innovation funding during EU budget preparations
- ✓ Thematic stakeholder consultations: ICT, transport, health, biotechnology, space,…
- ✓ Discussion with representatives of national administrations (CIP Joint Management Committees meeting, meetings of EIP Management Committee).

The Green Paper stakeholder consultation

After these early discussions - and following in the tracks of the Europe 2020 strategy, the Innovation Union Flagship Initiative and the EU Budget Review - the Commission took the initiative to launch a public consultation on the future of EU research and innovation funding. The consultation was based on a Green Paper entitled 'From Challenges to Opportunities: Towards a Framework Programme for research and innovation funding'. Stakeholders were asked for their views on how best to adapt the EU's research and innovation funding in the new policy context of Europe 2020 and the Innovation Union.

The public consultation was launched on 9 February 2011. A dedicated consultation website and an interactive blog were set up. The deadline for submitting responses was 20 May 2011. A conference was organised on 10 June 2011 in Brussels to present and discuss the outcome of the consultation.

The consultation was met with an overwhelming response. 2078 responses were received in total, including an unprecedented 775 position papers and 1303 responses to the online questionnaire. Contributions were received from a wide range of stakeholders, the highest numbers coming from the research and higher education sectors (50%), followed by associations and interest groups (29%), the business sector (12%) and government bodies (9%). There was a broad coverage of all EU-27 Member States as well as a significant number of other countries.

Complementary consultations

In addition to the dedicated consultation on the basis of the Green Paper, complementary consultations have been organised or are still ongoing on particular aspects of the EU's research and innovation funding. These include public consultations on the future of the current Competitiveness and Innovation Framework Programme and on the future strategy for the European Institute of Innovation and Technology. According to the provisions laid down in the EIT Regulation, the specific EIT related aspects will be dealt in a dedicated impact assessment.

Furthermore, each of the Directorates General in the Research and Innovation Family (EAC, ENER, ENTR, ENV, INFSO, MOVE, JRC) organised specific consultations on the challenges and objectives to be addressed through the proposed funding programme through a series of dedicated workshops with key experts and Member State representatives, the outcomes of which have been channelled into the design of the Framework Programme for research and innovation.

Main stakeholder views on future policy options by actor

These various discussions and consultations revealed striking similarities within each group of actors. The key messages to emerge were as follows:

- **Industrial enterprises** emphasized the need for more simplification combined with more attention dedicated to innovation supporting actions. A broad concept of innovation should be applied including non-technological and non research based innovation and activities such as design, creativity, service, process and business model innovation. EU funding for research and for innovation should be brought closer together, in order to enhance its impact and bring new ideas to the market in a more efficient manner. As such, they welcomed a policy option aimed at decreasing implementation costs due to more integration and simplification, such as a common set of rules for participation for the different strands of action. They also welcomed a policy option that would bridge research and innovation more strongly and focus stronger on the dissemination of results of research projects to allow for valorisation into new products, processes and services.
- **Universities and research centres** equally emphasized the need for further simplification, but also expressed strong support for research actions linked to societal challenges as well as basic research funding through ERC. Distributing EU research and innovation funding according to excellence was considered a key principle by the academic research community (but also other actors emphasized this) of any future EU research and innovation research framework. An improved "business-as-usual" option was seen as the minimum requirement: improved in terms of simplification, but continuation in terms of scope covering the current wide range of thematic research areas and types of research (basic and applied).
- **Public organisations and government bodies** all emphasized the need for a European-level framework for research and innovation support actions, thereby discarding the "renationalisation" option. Several Member States emphasized to continue with those aspects of the current programme that work well and are very much appreciated, such as Marie Curie actions, Risk Sharing Finance Facilities and transnational collaborative research (the academic community added the European Research Council in this list). The Structural Funds should be used to unlock the full research potential Europe's less-favoured regions.
- The common denominator among **all actors** was their agreement on the need to further simplify participation in European research and innovation framework programmes, which would argue against a simple continuation of the current system ("business-as-usual").

Extensive use of quantitative and qualitative evidence for CSF IA report

- ✓ Ex-post and interim evaluations (FP6, FP7, CIP, EIP, ICT-PSP, IEE, Marie Curie, ERC, …)
- ✓ Foresight and forward looking studies
- ✓ Statistical data (FP, CIP, Community Innovation Survey, …)
- ✓ Analyses of science, technology and innovation indicators (EC, ESTAT, OECD, …)
- ✓ Econometric modelling exercises (NEMESIS/DEMETER …)
- ✓ Academic literature reviews on, amongst others, impacts of research and innovation
- ✓ Sectoral competitiveness studies
- ✓ Expert Panels and Expert Hearings
- ✓ On-line surveys among FP and CIP beneficiaries

2. PROBLEM DEFINITION

2.1. The problem that requires action and its underlying drivers

The problem

In this the second decade of the 21st century, on the backdrop of a changing world order, Europe faces a series of crucial challenges: low growth, insufficient innovation, and a diverse set of environmental and social challenges. Europe 2020, the EU's comprehensive long-term strategy, recognizes these challenges and argues that Europe faces a moment of transformation. This perspective is taken up in the Commission's MFF Communication of June 2011, which underscores the pivotal role of Horizon 2020 in addressing these challenges.

The solutions to all of these problems are linked. It is precisely by addressing its environmental and social challenges that Europe will be able to boost productivity, generate long-term growth and secure its place in the new world order. The OECD (2011) has acknowledged that 'green and growth can go hand-in-hand'. The United Nations too has observed that there is no inescapable trade-off between environmental sustainability and economic progress: the greening of economies creates growth and employment (UNEP, 2011). In the same vein, the European Commission has published a Communication on "GDP and beyond - Measuring progress in a changing world" (EC, 2009a) and is pursuing sustainable and inclusive growth through Europe 2020.

The key problem driver

Science and innovation are key factors that will help Europe to move towards smart, sustainable, inclusive growth, and along the way to tackle its pressing societal challenges, as recognized in the EU Multi-annual Financial Framework for 2014 to 2020 (EC, 2011e). Box 1 shows why research and innovation are key engines of productivity and growth.

Box 1: Research and innovation – Key engines of productivity and growth

A wealth of evidence demonstrates the crucial role that research and innovation play in the sustainable growth of productivity and economic growth:

- Modern economic theory unanimously recognises that research and innovation are prerequisites for the creation of more and better jobs, for productivity growth and competitiveness, and for structural economic growth.
- The key role played by research and innovation in structural economic growth is highlighted by the modern 'growth accounting' literature, which integrates the concept of intangible assets (INNODRIVE, 2009).
- An extensive body of macro- and micro-economic literature has produced a number of clear conclusions:
  - *The returns to total R&D are high:*
    - A 0.1 percentage point increase in R&D could boost output per capita growth by some 0.3-0.4 per cent (Bassanini and Scarpetta, 2001).
    - An analysis by the JRC based on the Regional Holistic Model (RHOMOLO) shows a positive impact of increasing R&D intensity on real GDP growth in all countries and regions.
  - *The returns to public R&D are high*:
    - The rate of return for publicly funded R&D usually exceeds 30 percent.
    - Each extra 1 percent in public R&D generates an extra 0.17 percent in productivity growth (Guellec and van Pottelsberghe de la Potterie, 2001/2004).
  - *The returns to private R&D are high*:
    - Firms' returns to their own investment in research usually range from 20 to 30 percent. Societal returns to firm investment in research usually range from 30 to 40 percent.
    - Each extra 1 percent in business R&D generates an extra 0.13 percent in productivity growth (Guellec and van Pottelsberghe de la Potterie, 2001/2004).
  - *Research and innovation are vital for industrial competitiveness:*
    - The ability to innovate (in addition to size, productivity, and the skill intensity of the workforce) is positively related to firms' export performance. It also supports more complex internationalisation strategies, such as exporting to a larger number of markets, to more distant countries and producing abroad through FDI or international outsourcing (Navaretti et al., 2010).
  - *Technological change boosts employment*:
    - The often accepted view that innovation destroys jobs is wrong. Innovations have a positive and significant effect on employment, which persists over several years (Van Reenen, 1997).
    - For instance, an increase in business R&D by 1 percent is associated with an increase in business employment of 0.15 percent (Bogliacino and Vivarelli, 2010).

Europe suffers from a number of critical weaknesses in its science and innovation system, however, which contribute to the above problems of low productivity, declining competitiveness, inadequate response to societal challenges, and inability to move to a new sustainable economic model.

The key weakness driving the problem above is Europe's innovation gap. To boost future productivity and growth, it is critically important to generate breakthrough technologies and to translate them into innovations (new products, processes and services) that are taken up by the wider economy. However, while Europe has taken an early technological lead in many green and 'quality of life' (health, security, etc.) technologies, its advantage is tenuous in the face of growing competition, and has not translated into an innovative and competitive lead. It is imperative to establish a timely and targeted European policy in bridging the "valley of death" for Europe to remain competitive. Many of Europe's global competitors, including the US, China and Taiwan, have already developed policy measures in strategically important areas by bringing together different academic and industrial actors along the length of the innovation chain.

The underpinning structural problem drivers

Underlying the key problem driver is a series of structural problems:

Insufficient contribution of research and innovation to tackling societal challenges: Although many major societal challenges will have the same profound effects on all EU countries, there is still a relatively weak coordinated response at a pan-European level in the field of science and innovation. If each Member State provides its own response in an uncoordinated way, there is a danger of missing important opportunities for generating scale and interactions. To

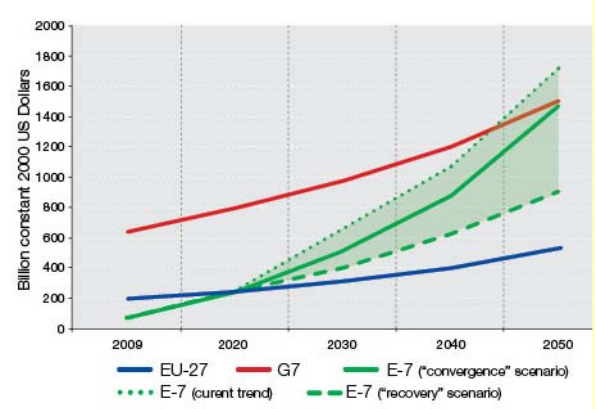
be successful Europe must stimulate coordinated research aimed at addressing these challenges and improve the way it is transformed into new products and processes. And it must enhance the interaction between research and innovation actions and the sectoral policies related to the challenges.

Insufficient technological leadership and innovation capability of firms: Europe faces a declining share of global patents, a rising high technology trade deficit and an insufficient number of high growth innovative companies in the high tech sector. If it is to address its innovation gap, Europe needs to improve its performance in key enabling technologies which will provide the basis for important new markets. And if it is to get its good ideas to market, it must improve the capability of firms to innovate, in particular SMEs. Access to finance for pulling innovations through to the market is still a major problem for companies, and SMEs still face special problems in this context. Box 2 and Figure 1 show how Europe currently lags in terms of patents in specific areas and is likely to start lagging in terms of its overall share of global patents.

Box 2: Long-term global trends in research spending and technological performance

Emerging economies are growing at a rapid pace, and will soon transform the global landscape for research and innovation. The left figure below shows the potential trends in R&D spending. Under conservative assumptions for growth and R&D spending[i], the emerging economies (Brazil, China, India, Indonesia, Mexico, Russia and Turkey) could be investing the same volume of R&D as the G7 countries by 2050, and by 2020, they could already be investing more than the EU. This expansion of R&D spending by the emerging countries should inevitably lead to their producing more patents in the coming decades. As seen in the right figure below, whereas the G7 currently account for 85% of PCT patent applications compared with only 8% for the E7 countries, by 2050 the G7 share could have diminished to 50%, with the E7 countries at nearly the same level (46%).

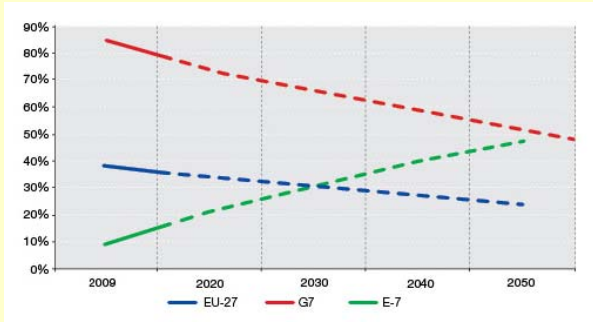
Long-term trends in R&D spending - emerging economies, G7 countries, EU-27



***Source**: DG Research and Innovation*

Data: HSBC estimates of GDP growth, OECD, World Bank

World shares of PCT patents[ii] - emerging economies, G7 countries, EU-27



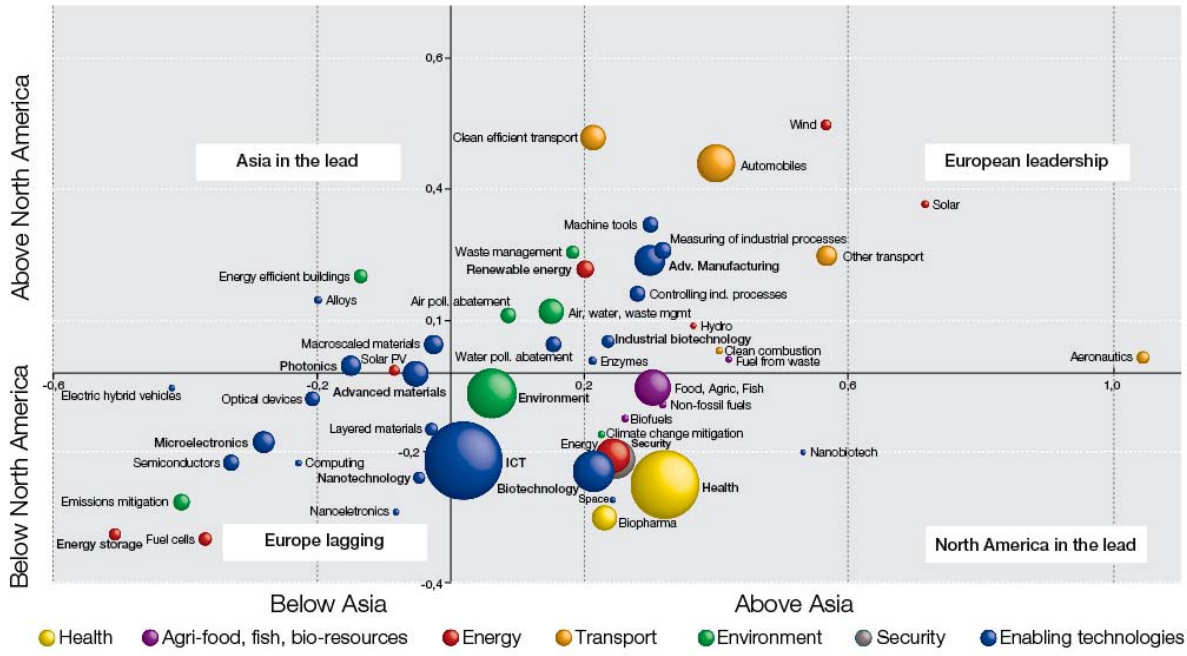
***Source**: DG Research and Innovation*

Data: OECD patent database

The need to strengthen the science base: Europe has a historically strong science base, but when it comes to highly cited science or top ranking universities, it often lags behind the US. For example, 15% of US scientific publications are among the top 10% most cited publications worldwide, only 11% of EU publications fall into this category. And Europe now faces increasing competition as well from the emerging countries. If it is to strengthen its scientific and technological performance, and to provide the basis for future competitiveness, it needs to increase its spending - in "blue sky" frontier research, in associated infrastructure,

in training and education – and to make this spending more effective. Box 2 shows how Europe lags in terms of its share of global R&D investment.

Figure 1: Europe's technological performance compared with North America and Asia[iii]



Source: *DG Research and Innovation*

Data: *OECD patent database and specific studies*[iv]

Insufficient cross-border coordination: The European Research Area is not yet achieved. Europe's research and innovation system remains constrained by national borders. Research funding is often dispersed, leading to duplication and inefficiencies. In spite of the benefits of coordination, almost 90% of R&D budgets are spent nationally without coordination across countries. Box 3 shows how fragmentation negatively affects the efficiency of public funding of research and innovation in Europe.

Of course it should be understood that a model that is at once sustainable, inclusive and smart will not depend solely on S&T but also on governance and on the involvement of the citizens who will make up our society – and shape it. A shift towards "the demand side" together with users' (and more broadly citizens') involvement is not only a prerequisite for more robust and flourishing technologies; it is also a prerequisite for more robust and flourishing societies.

In addition, though a big part of the solution, science, technology and innovation are not a panacea. For greening the economy, for instance, recycling will need to be stepped up, business incentives will need to be changed (by, for instance, shifting taxation from labour to resource use), business models will need to be adapted (by, for instance, paying for services instead of products), consumers will need to be incentivised to mend and renew rather than discard, labourers will need to be retrained and citizens will need social protection (Friends of Europe et al., 2011). Specific research on these aspects will be needed as well.

2.2. Who is affected by these problems?

The problems identified above affect all groups in society in diverse ways, and if nothing is done the negative impacts will continue to grow.

European citizens are affected across a range of issues: they require and expect high quality health care and solutions to fatal and debilitating illnesses; they hope that science and innovation can tackle problems such as climate change, clean energy, clean transport, an ageing population; and they look to Europe's research and innovation system to come up with new sources of jobs and higher standards of living.

Europe's Enterprises require a strong science and innovation system if they are to compete, expand and move into the emerging markets of the future. The problem of poor knowledge triangle coordination means that they have difficulties in linking to and exploiting basic research and in tapping into a pool of trained researchers. European companies, and notably SMEs, also face problems in accessing the finance they need for innovation.

EU Universities and public research centres must perform in an ever more global environment by raising the quality of their research and attracting the best scientists worldwide. But competition for funding is still very nationally-based, as are the research projects themselves, and - when scale is a factor for success – they face limits to what they can achieve in terms of breakthroughs. They have mixed success in forging links with innovation, and creating spin-off companies. At the same time, governments increasingly expect universities and public research centres to prove the societal and economic impacts of their research.

Government ministries and agencies responsible for science and innovation across Europe need to develop more effective policies to address societal challenges, and to stimulate competitiveness, through intervention in research, education and innovation. Policies to promote knowledge triangle linkages remain problematic. Government bodies increasingly recognize the need to promote excellence by increasing competition for public research and innovation funding, and face the limitations of doing this at a purely national level. More and more, they stress value for money and impact as key funding aims, and look to transnationally coordinated programmes and projects as an important channel for achieving them – through access to complementary knowledge, resources and networks.

2.3. The policy context

The EU recognizes the urgency of the situation, and is responding with new policy strategies. Europe 2020 and the Innovation Union flagship initiative have given a clear signal that the EU intends to rise to the challenge. Europe 2020 focuses on achieving smart growth, while the Innovation Union sets out measures to contribute to this aim. These include increasing investment in R&D and innovation to 3 percent of EU GDP by 2020, improving conditions for R&D and innovation (with the development of a new Europe 2020 headline indicator related to the weight in the economy of fast growing innovative companies, underpinning the capacity of Europe to transform its economy), refocusing R&D and innovation policy on major challenges for our society (like climate change, energy and resource efficiency, health and demographic change), and strengthening the links in the innovation cycle (from frontier research right through to commercialisation). In addition, the European Council has called for a completion of the European Research Area by 2014 in order to create a genuine single market for knowledge, research and innovation, which will require both funding and non-funding measures: funding is not always the appropriate solution and there is also a need for regulation, self-organisation, etc. A key challenge for the EU in implementing its strategy will be to build a next-generation expenditure programme which matches this level of ambition in both its budget and its aspirations.

Box 3: Fragmentation versus inefficiency of public funding of research and innovation in Europe

Among the various factors that can explain the efficiency of public support for S&T, one of them is specific to the EU: the fragmentation of public funding. Almost 90% of public support for civil R&D is decided directly by the Member States without any prior cooperation or even coordination. Only 12% of public funding is allocated through cooperative schemes - such as EU Framework Programmes, Eureka or intergovernmental collaborative measures - which help to avoid duplication between different national and regional funding actions. This sub-optimal situation is often tolerated, and sometimes seen as unavoidable, or even as a natural result of the competition between different national systems. However, a number of expert commentators have described this situation as a "fragmentation" of public financing. They maintain that competition should occur at the stages of research execution and of the dissemination/commercialisation of the results of national research programmes, and not at the public funding stage, because this leads to inefficiencies and duplication between uncoordinated funding schemes.

The case of nanotechnology is a perfect illustration of the negative impact of fragmentation of public resources on scientific and technological performance. In this key enabling technology, which is critical for future international competitiveness, the EU spends more public money annually than other developed or emerging countries.

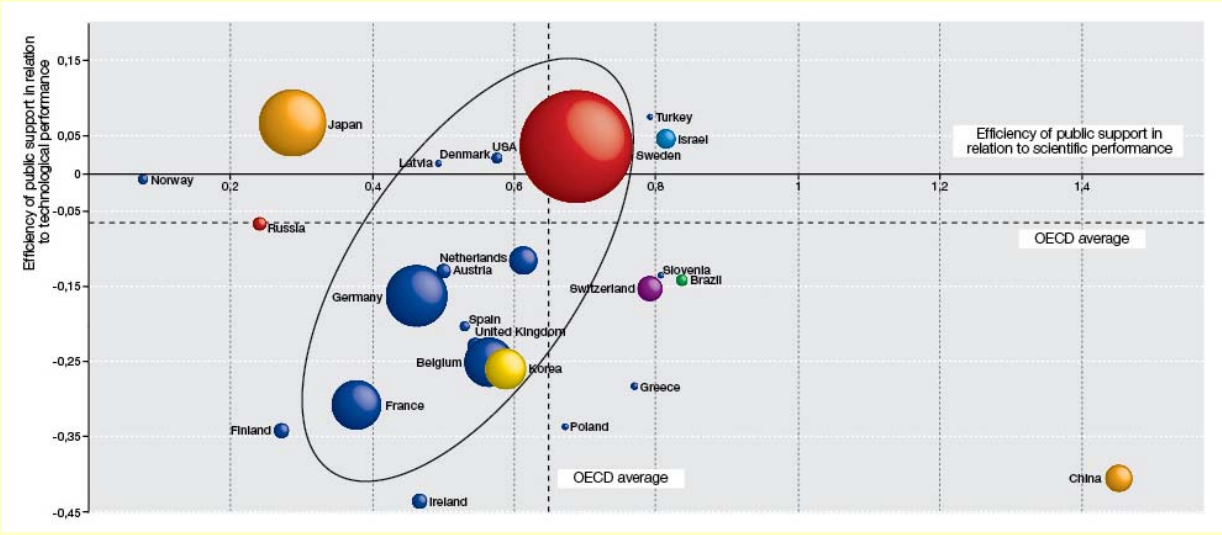
According to several recent estimates (NMP Scoreboard, 2011; Roco et al., 2010; OECD 2009), the Union spends around €1.5 billion annually (including the 27 Member States' national funding and EC funding), which is considerably more than the USA (€1 billion), Japan (€0.47 billion) and China (€0.1 billion).

However, as highlighted in a recent Communication of the EC (2009), "despite these relatively high levels of funding, the EU is not as successful in deploying nanotechnology as for example the US, when looking at the ability to transfer knowledge generated through R&D into patents".

The situation is similar if one looks at highly cited scientific publications, where 10% of EU publications are in the top 10% most cited publications, compared to 16.1% for the USA, 5.4% for Japan and 8.1% for China. Another indication of Europe lagging behind is the market introduction of nanotechnology-based products and applications. According to a recent nanotechnology product inventory compiled by the Project on Emerging Nanotechnologies at the Woodrow Wilson International Centre, a total of 53% of identified nanotechnology-based products come from the US, followed by companies in East Asia (24%), Europe (15%), and other world regions (8%).

The figure below shows the scientific and technological performance of selected developed and emerging countries (expressed in terms of the number of patents per 1M€ of public R&D support (2000-2005) and the number of highly cited publications per 1M€ public R&D, with the size of the bubble representing the volume of public R&D funding). Fragmented public funding in Europe leads to lower scientific and technological outputs per euro invested: the efficiency of EU countries can be seen lagging behind the US and the OECD average. Given the relatively low numbers involved, the performances of those countries with low funding levels should not be over-interpreted.

Efficiency and fragmentation of public support in Europe: the case of the nanotechnology[v]



Source: DG Research and Innovation

Data: Larsen et al (2011), Roco et al (2010), OECD (2008, 2009)

2.4. The need for EU intervention – Subsidiarity and European Added Value

The need for public intervention: Markets alone will not deliver European leadership in the new techno-economic context. The need for public intervention in research and innovation has never been in doubt. Research and innovation suffer from important market and systemic failures, in particular the further one is removed from the market, justifying public intervention at the best of times (see Annex 2 for more details). These always present failures are magnified, however, in times of systemic shifts in basic technologies. Locked-in investments, vested interests, high risks, and the need for significant investments in less profitable alternatives mean that change will be slow without a major push. In the case of eco-innovation, for instance, on top of generic innovation barriers, there are additional ones that slow down its development in the market and that justify additional policy efforts. Examples of these specific barriers are the failure to price environmental externalities, the lack of appropriate and credible information on the performance of some eco-innovative solutions or the additional difficulties in accessing and providing finance to these types of businesses. Large-scale public intervention in research and innovation is needed, through both supply and demand measures, such as pre-commercial public procurement of innovation.

The need for EU-level intervention: There is compelling evidence that Member States acting alone will not be able to make the required public intervention. Their funding of research and innovation was low when the economy was doing well, and is unlikely to increase in the near future as the economic-financial crisis continues to constrain public budgets (see Box 2). What investment does take place suffers from fragmentation and inefficiencies (See Box 3 and Annex 3). Security research constitutes a good example: total Member State public investment in security research does not exceed the FP7 budget for security research and suffers from fragmentation (highlighting clearly the added value of EU level intervention in terms of achieving an appropriate, "critical mass" level of investment and battling fragmentation).

The added value of EU-level intervention: The EU is well positioned to add value by delivering the large-scale investment in "blue sky" frontier research, in targeted applied R&D, and in the associated education, training and infrastructures which will help to strengthen our performance in thematically focused R&D and enabling technologies; by supporting companies' efforts to exploit research results and to turn them into marketable products, processes and services; and by stimulating the uptake of these innovations. A series of cross-border actions - concerning the coordination of national research funding, EU-wide competition for research funding, researcher mobility and training, coordination of research infrastructures, transnational collaborative research and innovation, and innovation support - are most efficiently and effectively organised at European level (See Box 4 and Annex 2). Ex-post evaluation evidence has convincingly demonstrated that EU research and innovation programmes support research and other activities that are of great strategic importance for participants, and that in the absence of EU support would simply not take place (See Box 5 and Annex 2). In other words, there are no substitutes for EU level support.

Evidence also demonstrates the European added value of policy support actions, which derives from bringing together knowledge and experience from different contexts, supporting cross-country comparisons of innovation policy tools and experiences, and providing the opportunity to identify, promote and test best practices from over the widest possible area.

The challenge facing the EU now is to design the next Multi-annual Financial Framework so as to propel Europe into premier position in establishing the green, healthy, and secure economy. And to do this it must build a next-generation expenditure programme for research

and innovation which is equal to the level of ambition of Europe 2020 and the Innovation Union.

Box 4: European Added Value - Why fund research and innovation at EU level?

EU support to research and innovation is provided only when it can be more effective than national funding. It does this through measures to coordinate national funding, and through implementing collaborative research and mobility actions.

Coordinated funding and agenda-setting

EU initiatives help to coordinate funding across national borders and to re-structure the R&D and innovation landscape in Europe:

- The EU has created the European Research Council. Without it, the EU would have a landscape of compartmentalized national research councils, but no mechanism to promote EU-wide competition for funds and to encourage higher scientific quality.
- Thanks to EU leadership, for the first time, a pan-European strategy on research infrastructures is now being implemented.
- The EU helps private companies come together and implement joint strategic research agendas through tailored instruments, such as European Technology Platforms and Joint Technology Initiatives.
- The EU joins up compartmentalized national research funding using instruments such as ERA-NETs and Article 185 initiatives, which set common agendas and achieve the funding scale required for tackling important societal challenges.
- The EU brings Member States together to test deployment of innovative technologies, i.e. ICT applications at real scale (through CIP-PSP) or large demonstration programmes in security (maritime surveillance, transport, crisis management, etc.).
- The EU brings together the public and private sectors to exchange best practices, share knowledge and thereby influence the innovation and other policies of Member States (ProInno, Europe Innova initiatives, environmental policies, security policies…).
- Through its Marie Curie actions, the EU set standards for innovative research training and career development and put in place a framework for the free movement of knowledge.

Coordinated funding reduces duplication and increases efficiency. EU support is vital - none of the above measures would have seen the light of day without an EU initiative.

Collaborative research projects and mobility actions

When it comes to implementing research and innovation projects, EU actions add value by stimulating transnational collaboration and mobility.

These actions generate a series of benefits that could not be achieved by Member States acting alone:

- Support for collaboration helps to achieve the critical mass required for breakthroughs when research activities are of such a scale and complexity that no single Member State can provide the necessary resources (space, security, etc.).
- The EU supports research which addresses pan-European policy challenges (e.g. environment, health, food safety, climate change, security), and facilitates the establishment of a common scientific base and of harmonized laws in these areas (Annex 1).
- Working in trans-national consortia helps firms to lower research risks, enabling certain research to take place. Involving key EU industry players and end-users reduces commercial risks, by aiding the development of standards and interoperable solutions, and by defragmenting existing markets.
- Collaborative research projects involving end-users enable the rapid and wide dissemination of results leading to better exploitation and a larger impact than would be possible only at Member State level.
- SME involvement in research and innovation at EU level improves their partnerships with other companies and labs across Europe, and enables them to tap into Europe's creative and innovative skills potential, to develop new products and services, and to enter new national, EU or international markets.
- Companies can collaborate with foreign partners and end-users at a scale not possible at national level, in projects tested for excellence and market impact, which induces them to invest more of their own funds than they would under national schemes.
- Cross-border mobility and training actions are of critical importance for providing access to complementary knowledge, attracting young people into research, encouraging top researchers to come to Europe, ensuring excellent skills for future generations of scientists, and improving career prospects for researchers in both public and private sectors.
- Cross-border innovation support leads to better policies and tools to help businesses bring innovation to the market.

Pilot and market replication projects focused on societal challenges

- The CIP supports eco-innovation addressing societal challenges such as resource efficiency and climate change. Pilot and market replication projects help European SMEs to partner, overcome market barriers, and position themselves successfully in the European market.

Source: DG Research and Innovation, DG Environment

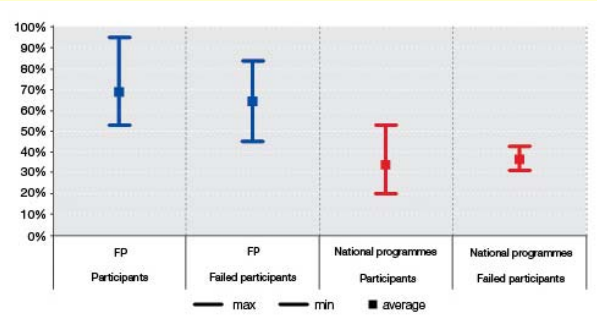
See the third section of Annex 2 for details on how EU research programmes provide European Added Value

Box 5: Assessing the added value of EU research and innovation programmes:

Measuring additionality

Because of the benefits offered by EU cross-border research, innovation and mobility actions – critical mass, addressing pan-European challenges, reducing risk, setting up European standards (Box 4) – it is not surprising to find that EU projects tend to be of strategic importance to participants. There is solid evidence of this from numerous recent studies. For example, a survey covering FP6 (IDEA Consult, 2009) found that "the average research project funded under FP6 [concerns] long-term, strategically highly important, technically highly complex R&D in a core technological area of the organisation. … It is tightly linked with other in-house projects but mainly considered only feasible with external collaborators".

Project additionality - comparison of FP and national programmes *(% respondents who did/would abandon the project without programme funding)*



Source: DG Research and Innovation
Data: FP data based on 20 studies of additionality of EU support; national programme data based on studies for Member State programmes in Austria, Belgium (x2) and Finland, and in Norway. See Annex 2 for details.

But EU projects are not just strategically important. Without the FP, most of them would simply not take place at all, or would be far less ambitious. The graph below summarizes the findings from 25 recent studies on the additionality of public R&D funding ("additionality" means looking at what would have occurred without public funding). What is clear is that the FP achieves very high levels of overall "project additionality": i.e. the great majority of FP participants would not have carried out their projects at all without FP funding. This finding also holds true for rejected applicants for FP funding, the great majority of whose rejected FP proposals were never subsequently implemented. However, it is also apparent from the graph that the "project additionality" achieved by the FP is much higher than that of most national R&D funding schemes. In other words, it seems that there are far fewer substitutes for EU funding than there are for national schemes.

When it comes to those projects that would have been carried out even in the absence of EU funding, the great majority would have changed dramatically, thus undermining their strategic importance. They would have been carried out on a smaller scale (with less money, with fewer partners), with a reduced scope (less ambitious), or at a later stage or over a longer period of time (such effects are referred to as "behavioural additionality"). Moreover, this "behavioural additionality" is also higher for the FP than for national R&D schemes.

Similarly, participants in the CIP eco-innovation projects indicate that they would not have benefited from the cross-border cooperation, learning and resulting EU-wide market scope if they only had access to national support programmes.

See the third section of Annex 2 for more details on how EU research supports strategic projects that would not have taken place otherwise

2.5. The EU's right to act

The EU's right to act in this area is set out in the Treaty on the Functioning of the European Union. Firstly, Community research policy has a number of overall objectives as stated in the Treaty on the Functioning of the European Union, which include: under Article 179, the strengthening its scientific and technological bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely, and encouraging it to become more competitive, including in its industry, while promoting all the research activities deemed necessary by virtue of other Chapters of the Treaties; and under Article 180, implementing research, technological development and demonstration programmes, by promoting cooperation with and between undertakings, research centres and universities; promoting research cooperation with third countries and international organisations; disseminating and optimising the results of EU research, technological development and demonstration; and stimulating the training and mobility of researchers in the Union.

In addition, Article 173 of the Treaty sets out the objective to ensure that the conditions necessary for the competitiveness of the Union's industry exist. It includes fostering better

exploitation of the industrial potential of policies of innovation, research and technological development.

The European Atomic Energy Community Programme (2014-2018) contributing to Horizon 2020 has its legal basis in the Euratom Treaty (in particular Article 7).

2.6. Experience from previous programmes: achievements

The next generation EU programme in the field of research and innovation can build on the extensive experience accumulated through the implementation of the FP, the innovation-related part of the CIP, and the EIT (see Annex 1 for a comprehensive analysis of past achievements and impacts). Over a period spanning several decades, EU research and innovation programmes have succeeded in involving Europe's and indeed the world's best researchers and public and private institutes and produced large-scale structuring effects, scientific, technological and innovation impacts, micro-economic benefits, and downstream macro-economic, social and environmental impacts in and for all EU Member States (see Box 6).

The FP has first of all achieved a vast reach, involving Member States and Associated Countries in accordance with their economic and research capabilities, and providing them with large-scale knowledge returns (Annex 1). It has also been successful in attracting large numbers of top EU and extra-EU researchers into thousands of high-quality cross-border projects which enable interaction between firms, universities and research institutes (Annex 1). Without EU funding, these projects would not have been carried out, or would have been postponed or scaled down (financially, in scope and ambition, or in terms of the number of partners – Box 5 and Annex 2). The FP has funded excellent, often inter-disciplinary, collaborative research on a very wide range of topics (Annex 0-Box 1 and Annex 1).

The FP has also facilitated the training and pan-European/extra-European mobility of researchers and enhanced the quality of doctoral training (including through industrial doctorates) (Annex 1). It has added to the research capabilities of participating institutions and formalised and oriented the R&D and innovation processes of organisations, notably organisations that are small (e.g. SMEs), young (e.g. start-ups) and from recently acceding Member States and candidate countries (Annex 1). The example of FP6 and FP7 "Future and Emerging Technologies" (FET) is illustrative. FET fulfils its mission of triggering explorative research, and has a strong effect on strengthening the competitiveness of participating organisations. It also contributes to a high degree to the enhancement of skills and capabilities of R&D staff and linkages between universities and research institutes (Wing, 2009).

In addition to producing new knowledge embodied in large numbers of influential (highly-cited) publications, the FP has enhanced the development of new products and processes, the development and use of new tools and techniques, the design and testing of models and simulations, and the production of prototypes, demonstrators, and pilots (Annex 1). The FP has generated large numbers of patents and enabled participants to increase their turnover and profitability, raise their productivity, expand their markets, reorient their commercial strategy, improve their competitive position, enhance their reputation and image, and reduce commercial risk (Annex 1). In addition, the results of FP direct and indirect actions have supported EU-level policy formulation (Annex 1). The FPs' positive impacts on innovation have translated, down the line, into large-scale positive macro-economic, social and environmental impacts (Chapter 5 and Annexes 2, 4 and 5).

Box 6: Member States assess EU research and innovation programmes positively

- According to a **German** evaluation of FP6 (Federal Ministry of Education and Research, 2009), scientific personnel participating in FP6 stated that a substantial part of their publications and of their patent applications was due to their participation in the FP. "Large, export-oriented companies as well as companies in the field of cutting-edge technology and the knowledge-intensive service sector were more likely to take part in European Programmes than in federal or Länder programmes among other reasons because participation tended to have a positive effect both with regard to the extent of their own R&D activities and the commercial success of innovations".
- A **UK** evaluation of FP6 and FP7 (Technopolis, 2010) found that the FP has a big impact on the nature and extent of UK researchers' international relationships and networks, as well as on their knowledge base and scientific capabilities. A majority of UK business participants stated that their involvement in the FP had yielded important commercial benefits. "Around 20 percent of businesses stated that their participation had made significant contributions to the development of new products and processes and in around 10 percent of cases organisations reported increased income and market share". Lastly, company interviews suggested that FP participation had made a significant contribution to the competitiveness of leading players in several niche technology markets, from inkjets to photonics.
- A **Swedish** long-term evaluation of the FP (VINNOVA, 2008) found significant impacts on the ability to compete in vehicles and in electronics (especially telecommunications). In ICT, FP participation in European and global standardisation had been a key factor in building the Swedish telecommunications industry's position in mobile telephony, while in vehicles, the FP had, together with complementary national programmes, been instrumental in supporting the Swedish industry's technical specialisations, especially in safety and combustion. "FP money has been one of the factors enabling the [automotive] industry in general, and Volvo AB in particular, to maintain the high level of technological capabilities that have so far protected vehicles design and production activities in Sweden, which from a scale logic are anomalous".
- According to a **Finnish** evaluation of FP6 (TEKES, 2008), "commercialisable output is not the core objective of the FPs but EU collaboration nonetheless contributes significantly to the creation of innovation".
- According to an **Irish** evaluation of FP6 (Forfas, 2009), each project produced, on average, 0.1 patent applications and 0.4 new or significantly improved commercial product or service. 80 percent of participating organisations or research groups improved their ability to attract staff or increased employment (low impact: 27%, medium impact: 42%, high impact: 11%).
- According to a **Dutch** FP impact study, "the [FP's] impact on the human research capital in the Netherlands is considerable, with approximately 1200 researchers in the public sector alone funded by the FPs annually. For many research groups this is an important factor to guarantee the continuity of the group".
- A **Spanish** evaluation of FP6 participation (Zabala Innovation Consulting SA, 2010) found that "for 52% of the surveyed researchers, participation in the FP contributed to strengthening their research teams, above all due to the scientific excellence offered by the acquisition of capabilities and abilities during the project". With regard to the creation of university posts, the FP performed better than national or regional programmes according to 38.89 percent of respondents and equally well according to 50 percent of respondents.
- According to a **Swiss** evaluation of FP5 and FP6 (State Secretariat for Education and Research, 2009), participation generated both knowledge and jobs. "While certain significant benefits of Switzerland's participation in FPs are not measurable, there is no doubt that FPs have various impacts in social (welfare, security, equality, education, …) and employment…, even if it is not known to what extent or in what way, precisely".
- "Do not fix what is not broken" is a message coming from the public consultation on the future of the Competitiveness and Innovation Framework Programme. There is general agreement that the areas covered by the current innovation programmes are important and with cross-cutting relevance. Given that a majority of the existing measures work well, it is recommended to base the future programme on current achievements.

See Annex 1 for more evidence on the impact of European programmes on national research and innovation systems

More broadly, the FP has produced durable changes in the EU research and innovation landscape contributing to the achievement of the European Research Area - so-called "structuring effects". If it were not for the FP, the European Research Council, promoting excellence across Europe, would not have been created; the EU would then have been left with a landscape of compartmentalized national research councils, but would have had no funding mechanism to promote EU-wide competition for funds and to encourage higher scientific quality in frontier research. Thanks to the FP, the EU leads in the creation and use of research infrastructures of pan-European importance: thanks to EU leadership, for the first

time, a pan-European strategy on research infrastructures (the so-called ESFRI roadmap) has been developed and is now being implemented. Marie Curie actions have created a framework for researcher career development and the free movement of knowledge. Collaborative research projects, international cooperation actions, mobility actions, and research infrastructure actions have generated durable, cross-sectoral, and inter-disciplinary research and innovation networks across Europe, as well as with the world's fastest growing research nations. And many of these networks have remained active after the end of EU funding. European Technology Platforms and ERA-NETs have served as useful focusing devices that have helped stakeholders identify and explain their R&D needs jointly, easing the process of developing mutually supportive policies at EU and Member State levels. Joint Technology Initiatives have focused and aligned key actors in their respective areas, serving as a support to develop coherent sectoral strategies. Article 185 and Joint Programming initiatives have achieved a better coordination of R&D in Europe and supported a more coherent use of resources (Annexes 1 and 2).

The CIP has increased innovation by SMEs by fostering sector-specific innovation, clusters, networks, public-private partnerships and cooperation with international organisations, and the use of innovation management. New types of innovation services have been developed and explored. Support to eco-innovation is contributing positively to the achievement of the Europe 2020 objective of smart and sustainable growth by facilitating access to finance of businesses marketing eco-innovations in areas related to resource efficiency and climate change through pilot and market replication projects and financial instruments.

In the same spirit, the evaluation of the Risk-Sharing Finance Facility (RSFF), the FP7 debt-financing financial instrument, published in November 2010 and carried out by an Independent Expert Group concluded that the RSFF appears as an innovative, anti-cyclical demand-driven financial instrument, efficiently managed by the Commission and the EIB. The Expert Group considered that it helped to expand drastically the financing for research, development and innovation, highlighting in particular that considerable results exceeding initial expectations had been achieved on an EU-wide scale.

2.7. Experience from previous programmes: Learning lessons and the need for change

However, while European research and innovation programmes have been successful, there are important lessons to be learned from the past, academic insights and stakeholder feedback.

A first key lesson learned is that current EU research and innovation funding suffers from weak horizontal policy coordination in two respects. The coordination among research, innovation and education policies is too weak since research, innovation and education is the subject of 3 separate programmes and initiatives - the FP, the innovation-related part of the CIP and the EIT – and there are hardly any coordination arrangements between the three. The broader horizontal policy coordination between these knowledge triangle policies and other policies is weak since the links between on the one hand, the FP, the CIP and the EIT, and on the other hand, cohesion funding and the energy, transport, agriculture, etc. policies are not explicitly considered, which hampers the valorisation of research results into new products, processes and services. With regard to horizontal policy coordination in the narrow sense, the FP7 interim evaluation (Annerberg et al., 2010) noted that a strategic shift is needed to establish stronger and better connections between research, innovation and education. As for broader horizontal policy coordination, the FP6 ex-post evaluation (Rietschel et al., 2009) called for a clearer division of labour between the FP and the cohesion funds. It also stated that other EU policies such as transport and energy would benefit from a more coordinated interface between FP research activities and regulatory and demand-side policies.

Stakeholders have also called for closer knowledge triangle and broader horizontal policy coordination.

A second key lesson learned is that current EU research and innovation funding suffers from a lack of clarity of focus and a weak intervention logic. The lack of clarity of focus is situated first of all at the aggregate level of EU support for research, innovation and education. The FP, the innovation-related part of the CIP and the EIT constitute three separate programmes and initiatives, their objectives are not fully aligned, and together they account for many specific programmes and funding schemes. The lack of clarity of focus is also apparent at the level of individual programmes. The FP, for instance, suffers from a plethora of too general higher-level EU objectives, and is fragmented into 10 comparatively stand-alone thematic priorities. In addition, the FP, for instance, lacks an explicit breakdown of higher-level objectives into intermediate and operational objectives and is focused on sectors and technologies rather than on the achievement of objectives.

Other important lessons learned are that programme access should be improved and participation increased from start-ups, SMEs, industry, less performing Member States and extra-EU countries, and that monitoring and evaluation need to be strengthened (Annex 1).

3. OBJECTIVES

In order to tackle the problems identified in section 2, it is important to clarify the objectives of EU action in the field of research and innovation. The following objectives have been identified.

General objective

Contribute to the objectives of the Europe 2020 strategy and to the completion of the European Research Area

Specific objectives

In order to achieve these general objectives, there are five specific objectives:

- *Strengthen Europe's science base by improving its performance in frontier research, stimulating future and emerging technologies, encouraging cross-border training and career development, and supporting research infrastructures*
- *Boost Europe's industrial leadership and competitiveness through stimulating leadership in enabling and industrial technologies, improving access to risk finance, and stimulating innovation in SMEs*
- *Increase the contribution of research and innovation to the resolution of key societal challenges*
- *Provide customer-driven scientific and technical support to Union policies*
- *Help to better integrate the knowledge triangle - research, researcher training and innovation*

Operational objectives

To reach the specific objectives above, the following operational objectives have been set:

- *Increase the efficiency of delivery and reduce administrative costs through simplified rules and procedures adapted to the needs of participants and projects*

- *Create transnational research and innovation networks (knowledge triangle players, enabling and industrial technologies, in areas of key societal challenges)*

- *Support the development and implementation of research and innovation agendas through public-private partnerships*

- *Strengthen public-public partnerships in research and innovation*

- *Support market uptake and provide innovative public procurement mechanisms*

- *Provide attractive and flexible funding to enable talented and creative individual researchers and their teams to pursue the most promising avenues at the frontier of science*

- *Increase the trans-national training and mobility of researchers*

- *Provide EU debt and equity finance for research and innovation*

- *Promote world-class research infrastructures and ensure EU-wide access for researchers*

- *Ensure adequate participation of SMEs*

- *Promote international cooperation with non-EU countries*

Chapter 6 sets out a series of indicators that can be used for measuring the achievement of the above objectives.

4. POLICY OPTIONS

The EU Budget Review (COM (2010) 700) put forward some general key principles that are of particular importance for the area of research and innovation - focussing on instruments with proven European added value, becoming more results-driven, and leveraging other public and private sources of funding. More specifically, the Budget Review identified research and innovation spending as a key priority and called for future EU instruments to work together in a Framework Programme for research and innovation (in line with the European Court of Auditors' Special Report 9/2007). Against his background, a range of options have been examined to reform the EU research and innovation funding framework. This Impact Assessment considers four policy options in particular: Business-as-usual (BAU); Improved business-as-usual (BAU+); Horizon 2020 - Framework Programme for research and innovation; and Renationalisation. The complete discontinuation option is also considered but to a lesser extent (when assessing macro-economic impacts). Assessing the business-as-usual option is in accordance with Commission Impact Assessment Guidelines (EC, 2009b), which clearly specify that the set of options considered should include amongst others the 'no policy change' baseline scenario. Assessing renationalisation and complete discontinuation options is in accordance with Commission Impact Assessment Guidelines (EC, 2009b) recommendations and with Commission President Barroso's commitment to evaluate the cost of non-Europe for Member States and national budgets.

Option 1. Business-as-usual: maintaining the current plurality of programmes for R&D and innovation

In this scenario, the main existing EU sources of funding for research and innovation – the FP, the innovation-related part of the CIP, and the EIT – are simply carried forward into the next Multi-annual Financial Framework as separate instruments, with separate objectives, and in their current formats. The next Multi-annual Financial Framework therefore includes a "Framework Programme of the European Community for Research, Technological Development and Demonstration Activities" composed of 5 specific programmes ("Cooperation" ,"Ideas", "People", "Capacities" and "Non-nuclear actions of the Joint Research Centre"), a "Framework Programme of the European Atomic Energy Community (Euratom) for Nuclear Research and Training Activities" consisting of 2 specific programmes (one on fusion energy research, and nuclear fission and radiation protection, and one on the activities of the Joint Research Centre in the field of nuclear energy), a CIP including innovation-related actions, and the EIT.

Option 2. Improved business-as-usual: loose integration and stand-alone simplification

In this scenario, the three currently stand-alone programmes and instruments – the FP, the innovation-related part of the CIP, and the EIT – remain separate and basically retain their current formats. This means that like under the business-as-usual option, the next Multi-annual Financial Framework therefore includes a "Framework Programme of the European Community for Research, Technological Development and Demonstration Activities" composed of 5 specific programmes ("Cooperation" ,"Ideas", "People", "Capacities" and "Non-nuclear actions of the Joint Research Centre"), a "Framework Programme of the European Atomic Energy Community (Euratom) for Nuclear Research and Training Activities" consisting of 2 specific programmes (one on fusion energy research, and nuclear fission and radiation protection, and one on the activities of the Joint Research Centre in the field of nuclear energy), a CIP including innovation-related actions, and the EIT. However, a certain measure of integration is pursued as these programmes and instruments are put together under a 'common roof'. This means, first, that the higher-level objectives of the three programmes and instruments are loosely aligned and broadly oriented towards the achievement of the objectives of Europe 2020 and the maximization of the contribution of research and innovation to the resolution of societal challenges. However, there is no single overarching integrated intervention logic covering the three programmes and instruments, however. Second, loose coordination mechanisms are established between the three programmes and instruments and a rough division of labour is established between them. However, the different programmes and instruments are not tightly integrated with each other in a perfectly complementary manner, leaving gaps in the support portfolio and preventing the provision of "seamless support". Third, in order to meet stakeholder demands, each programme and instrument simplifies its own rules and implementing modalities. However, no attempts are made to harmonise rules and implementing modalities across the three programmes and instruments resulting in a single set of administrative procedures.

Option 3. Horizon 2020: establishing a "Framework Programme for Research and Innovation"

In this scenario, the FP, the innovation-related part of the CIP, and the EIT are put together into a single framework: Horizon 2020, the Framework Programme for Research and Innovation. The current separation between research and innovation is fully overcome; seamless support is provided from research to innovation, from idea to market. Horizon 2020 sets out three strategic policy objectives for all research and innovation actions closely linked to the Europe 2020 agenda and the flagships on Innovation Union, Digital Agenda, Industrial

Policy, Resource-efficient Europe, Agenda for New Skills for New Jobs and Youth on the Move: raising and spreading the levels of excellence in the research base; tackling major societal challenges; and maximising competitiveness impacts of research and innovation. The selection of actions and instruments is driven by policy objectives and not by instruments. To address its aims, Horizon 2020 is structured around three complementary and interlinked priorities - (1) Excellent Science; (2) Industrial Leadership; (3) Societal Challenges – and 2 additional parts supporting those priorities: JRC non-nuclear direct actions and EIT. Horizon 2020 provides the context for a major simplification and standardisation of implementing modalities. The simplification concerns both funding schemes and administrative rules for participation and dissemination of results. The new single set of simplified rules applies across the three blocks of Horizon 2020, while allowing for flexibility in justified cases. The Horizon 2020 option also includes an expanded use of externalisation of the implementation of research and innovation actions and a greater reliance on innovative financial instruments. As stated earlier, a separate Impact Assessment has been undertaken dealing explicitly with the future Rules for Participation and the reader is referred to this Staff Working Document.

Option 4. Bring to an end EU level R&D financing and re-nationalise R&D and innovation policies

The renationalisation option consists of discontinuing EU research and innovation programmes and of spending those funds at Member State level, either on domestic issues or to engage in inter-governmental collaboration. The complete discontinuation option, on the other hand, which as already mentioned will be assessed to a lesser extent (when assessing macro-economic impacts), consists of discontinuing EU research and innovation programmes altogether, so not spending those funds at Member State level either.

5. ANALYSING THE IMPACTS AND COMPARING THE OPTIONS

5.1. How the options were compared

The four policy options identified and presented in Chapter 4 – BAU, BAU+, Horizon 2020, and renationalisation - were compared along a range of key parameters selected for their relevance in assessing public intervention in research and innovation. The comparison along these parameters was carried out in an evidence-based manner. A range of quantitative and qualitative evidence was used, including ex-post evaluations; foresight studies; statistical analyses of FP application and participation data and Community Innovation Survey data; analyses of science, technology and innovation indicators; econometric modelling exercises producing quantitative evidence in the form of monetised impacts; reviews of academic literature on market and systemic failures and the impact of research and innovation, and of public funding for research and innovation; sectoral competitiveness studies; expert hearings; etc.

5.2. Comparing the options and assessing cost-effectiveness

Coherence in terms of focus and intervention logic

The BAU option suffers from a lack of clarity of focus and from an under-developed and non-transparent intervention logic, as evidenced by ex-post evaluations. The Horizon 2020 option responds best to these concerns. It focuses on a limited number of mutually consistent and concrete higher-level objectives that are closely related to Europe 2020, *i.e*. on growth and the resolution of 6 societal challenges through research, innovation, and the training and skills development of researchers. It puts together the FP, the innovation-related part of the CIP, and the EIT into a single framework, reduces the number of programme pillars and funding schemes, and thereby facilitates the gearing of all programme components towards the

achievement of those common objectives. The Horizon 2020 option is also marked by a more developed and transparent intervention logic, which reflects closely the breakdown of general objectives into specific and operational objectives in Chapter 3. The Horizon 2020 option has the support of all types of stakeholders, who agree on the need to orient EU research and innovation funding towards the resolution of societal challenges and the achievement of ambitious EU policy objectives in areas such as climate change, resource efficiency, energy security and efficiency, demographic ageing, etc., and who support the centring EU research and innovation funding around three objectives - tackling societal challenges, strengthening competitiveness, and raising the excellence of the science base (see Chapter 1 for more details).

Critical mass, flexibility, excellence

Ex-post evaluations have shown that the BAU option (and therefore also the BAU+ option) achieves critical mass,[vi] is flexible to a certain extent, and promotes excellence. The Horizon 2020 goes further by enhancing programme flexibility. It maintains cross-thematic joint calls, problem-oriented work programmes promoting inter-disciplinary research, and the scope for integrating emerging priorities but also strengthens bottom-up schemes and makes work programmes less prescriptive. The Horizon 2020 option therefore responds better than the BAU and BAU+ options to demands from all types of stakeholders that funding opportunities be less prescriptive and more open, with sufficient scope for smaller projects and consortia, as these allow for more innovation; that project implementation should be made more flexible; and that the new funding programme will need both curiosity-driven and agenda-driven activities, working in tandem (see Chapter 1 for full details). Horizon 2020 also enhances the promotion of excellence. It maintains the pan-European competition for funding, as well as the screening for excellence of all proposals, but allocates a larger share of the budget to the European Research Council.

Accessibility and reach

The BAU option is associated with high administrative costs for applicants and participants that compromise accessibility, reach, and support from all types of stakeholders. This emerges from all FP ex-post evaluations. The Horizon 2020 option introduces simplification, and flexibility as appropriate, as well as enhanced accessibility, extended reach, and higher levels of support from all types of stakeholders. Due to programme consolidation and simplification, proposal preparation and project participation become less complex and costly, there are no learning costs associated with different procedures for different programmes, and similar sets of documents do not have to be submitted multiple times. This results in lower barriers to project participation and coordination. As a result, programme accessibility is improved and programme reach is extended. A study carried out by Deloitte points to the Horizon 2020 option's potential in terms of time and money saved by applicants and participants when preparing their proposals or administratively managing their projects (Deloitte, 2011). The Horizon 2020 option responds best to demands from all types of stakeholders that simplification be a key priority for any future EU funding programme for research and innovation (see Chapter 1 for full details).

Small and medium-sized companies

As shown by ex-post evaluation material, the BAU option is associated with high levels of administrative burden. SMEs are particularly affected by the resulting barriers to programme application and participation (see Box 7). At the same time, the BAU option is associated with weak knowledge triangle coordination and this affects in particular the research, research result valorisation, and innovation efforts of SMEs, who are often unable by themselves to move along the complete innovation chain. The Horizon 2020 option consolidates and simplifies across programmes and initiatives, making proposal preparation and project participation less complex and costly, and lowering barriers to project participation in particular for SMEs. At the same time, Horizon 2020 addresses the BAU and BAU+ options' lack of knowledge triangle coordination by establishing a single framework facilitating close coordination between research, innovation, and researcher training and skills development, while enabling the provision of 'seamless' supply-side and demand-side research and innovation support. The Horizon 2020 option squares best with views from SME stakeholders that all SMEs with innovation requirements should be able to benefit from EU research and innovation funding.

Box 7: Assessing SME participation in EU research and innovation programmes

5.3. EU research and innovation programmes involve large numbers of SMEs:

- About 11,200 SMEs (16.9% of total) participated in FP6. Some 7,000 individual SMEs have so far participated in FP7. If current trends continue, 20,000 SMEs will have received €6 billion of FP7 funding (+/- 11% of the total) by the end of the programme. 14.4% of the 'Cooperation' collaborative research budget (€1.77 billion) has been granted to SMEs during the first 4 years of FP7 (2007-2010). SME dedicated calls are expected to increase the EU contribution to SMEs towards the 15% target set by the FP7 Decision. Some thematic priorities like security achieve high levels of SME participation (>20%).
- Under the CIP, 137 highly innovative SMEs benefited from financial instruments/venture capital, 25 of them in the eco-innovation sector.
- CIP pilot and market replication projects aim at testing in real conditions innovative solutions that have not yet significantly penetrated the market due to high residual risks. In the area of ICT-based services, 125 projects have been funded to date, reaching around 530 SMEs. Regarding eco-innovation projects, almost 70% of final beneficiaries are SMEs. In the field of Intelligent Energy dissemination and information projects, SME participation is also high reaching almost 50%. In absolute numbers, 235 projects funded by the calls published so far, involve about 1,000 SMEs directly and spread the results through large multiplier associations far beyond this scope.
- With regard to the Helpdesk on Intellectual Property Rights (IPR), more than 2,300 SMEs have participated in awareness raising events and tools and more than 600 SMEs have taken part in IPR training. About 4,000 queries on IPR coming from SMEs have been dealt with (data for the entire project from December 2007 to February 2011).

Europe's best performing SMEs participate:

A SME profiling exercise (120 case studies) has revealed that 21.7% of all SME participants are strategic innovators; approx. 30% seeks exploitation opportunities and translates research results into products and services; more than 40% conduct technology intelligence and networking activities, not being positive about marketable results. 34 of the 500 fastest growing enterprises in Europe in the year 2010 participated in the FP, almost all of them several times.

Europe's SMEs derive substantial benefits:

More than 70% of SMEs report a positive impact on their operations, processes, methods, tools or techniques; 75% have introduced one new technology to the company and half of the SMEs claim to have increased turnover due to their project involvement.

SMEs are concerned:

SME access to EU funding is currently hampered by the fragmentation and multitude of support instruments with varying objectives. The programming, implementation and monitoring of EU research and innovation programmes are not synchronised and fail to provide coherent support promoting the whole chain to turn ideas and research results into new products and services. Administrative rules and procedures are not adapted to small players, and they lack targeted information and coaching (one-stop-shop).

See Annex 1

Coherence in terms of knowledge triangle and broader horizontal policy coordination

As demonstrated by ex-post evaluations, under the BAU option, knowledge triangle coordination is weak: research, innovation, and researcher training and skills development are the subject of 3 separate programmes and initiatives - the FP, the innovation-related part of the CIP, and the EIT – and there is little coordination between the three. When it comes to broader horizontal policy coordination, the BAU option is also very limited: the links between on the one hand, the FP, the innovation-related part of the CIP, and the EIT, and on the other hand, cohesion funding and the energy, transport, agriculture, etc. policies are not explicitly considered. The Horizon 2020 option responds best to concerns about knowledge triangle and broader horizontal policy coordination. A single framework consisting of three complementary priorities with strong links between them promotes close coordination between research, innovation, and researcher training and skills development, and ensures the provision of "seamless support from research to innovation, from idea to market". The creation under Horizon 2020 of a priority explicitly focused on the resolution of societal challenges aids the interaction with other policy domains. Horizon 2020 constitutes for these policy domains a single, consolidated counterpart, which facilitates the execution of the research and innovation components of ambitious sectoral agendas such as the SET-plan. Because of these reasons, the Horizon 2020 option responds best to demands from all types of stakeholders for closer knowledge triangle and broader horizontal policy coordination (see Chapter 1 for full details).

Structuring and leverage effects

The BAU option produces strong structuring effects (permanent changes in the European R&D landscape, see Annex 1 for details) and large leverage effects (which concern the ability to mobilise additional amounts of public and private research and innovation funding, see Box 8). The Horizon 2020 option maximises these structuring and leverage effects by achieving large-scale simplification, thereby maximising the programme's attractiveness to industry, science-industry linkages, and private sector crowding-in, and through the greater use of structuring instruments like joint technology initiatives and joint programming actions. At the same time, it provides for the necessary flexibility to cater for the specific needs of the business community.

Innovation impacts

The BAU option produces very strong scientific and technological impacts and substantial innovation impacts (see Box 9 and Annex 1). Nevertheless, evaluations have concluded that more attention should be paid to the production of project outputs and to their dissemination and economic valorisation, in particular since the FP aims to support Europe's competitiveness. Horizon 2020 is designed to maximise innovation impacts by providing "seamless support from research to innovation, from idea to market" in a number of ways: by increasing the emphasis on research project output; by pro-actively supporting research result dissemination, demonstration, and piloting; by strengthening support for market take-up; by funding projects that cover a number of stages in the innovation chain; by supporting SME research and innovation throughout; and by including supply as well as demand measures. This is achieved through a number of flexible funding schemes such as research and innovation grants; training and mobility grants; programme co-funding grants; grants to public procurement of innovation; support grants; debt finance and equity investments; prizes; and procurement. The Horizon 2020 option therefore responds best to the message from stakeholders, especially industrial ones, that, in terms of creating more innovation, the EU should support all stages in the innovation chain. In this context, there is frequent mention of the need to include more support for closer to the market activities (such as demonstration,

piloting and market replication) and to improve the framework for public-private partnerships (see Chapter 1 for full details).

Box 8: Leverage effects of EU research and innovation financial (and other) instruments

EU research and innovation financial instruments leverage private funding:

- The **Risk-Sharing Finance Facility (RSFF)** is an innovative debt financing instrument jointly set up by the Commission and the European Investment Bank that provides loans and guarantees for private companies or public institutions with a higher financial risk profile for their research, technological development and innovation activities (RDI). Commercial banks are largely absent from higher-risk lending for RDI investments due to its riskiness and uncertainty of repayment. This situation has even worsened since the financial crisis in 2008/2009. Therefore the RSFF fills in the market gap in high-risk loans for RDI activities. As evidenced by ex-post evaluations, the multiplier effect of the FP7 RSFF is expected to be 12 between the EU contribution and the volume of loans, and over 30 between the EU contribution and the additional leveraged investment in RDI.
- **CIP financial instruments** supporting innovation in collaboration with the European Investment Fund (EIF) address market gaps in equity finance, notably early-stage Venture Capital and access to finance for SMEs in general (through guarantees for loan portfolios of financial intermediaries). The recent ex-post evaluation demonstrate that they have acted as a cornerstone investor in 17 venture capital funds leveraging €1.3 billion of total investment in growth-oriented SMEs. The leverage effect of the GIF, which concerns equity investments, is 6 to 1.

Other activities within EU research and innovation programmes also have a strong leverage effect on private investments, as demonstrated by a wealth of evidence:

- An extensive body of academic economics literature has demonstrated that public subsidies for R&D produce crowding-effects, i.e. have a positive net effect on the total availability of R&D funding, and that these crowding-in effects are larger for collaborative research (Annex 2).
- An econometric analysis of Community Innovation Survey micro-data carried out by JRC in collaboration with DG Research & Innovation has concluded that FP support has a crowding-in effect on the level of companies' R&D investments (Box 8).
- These findings are confirmed by a wide range of ex-post evaluations:
  - The Clean Sky Joint Technology Initiative mobilises about €800 million in private in-kind contributions to achieve the single largest aeronautics research venture in Europe so far.
  - The space innovation project KIS4SAT (start-ups, business support schemes, vouchers for innovation activities) leveraged €10-20 million via involvement in supporting fund raising activities.
  - A recent external evaluation of EIT suggests that the overall leverage effect of its KIC funding will be between 4 and 5 to 1 (€1 of EIT funding produces €4-5 of additional funding) by the end of 2013.The EIT provides on average up to 25% of KIC budgets, which leverages 75% of supplementary investment emanating from a range of public and private sources.
  - 60% of all surveyed FP7 health research participants stated that EU funding helped access other research funding. 15% of the SMEs that leveraged additional research funds did so from business angels or venture capitalists.

EU research and innovation programmes also leverage public funding:

- For ERA-NETs, the leverage effect of FP funding is close to 5, while for ERA-NET Plus, it is 2.5. More than 15 of the initial FP6 ERA-NETs achieved leverage effects of 10 and more: €1 of FP funding resulted in €10 of coordinated research funding.
- A survey among FP6-IST programme participants (WING, 2009) showed that about two thirds (~65%) of industry participants increased their ability to get further R&D funding not only in-house but also (and especially for SMEs) from other EU or national sources.
- FP participation in Socio-Economic Sciences and Humanities (SSH) facilitated access to additional funding in 68% of the projects.
- Marie Curie actions leverage additional regional, national and international funds through the co-funding mechanism of individual fellowships such as COFUND. The total budget of the 81 COFUND programmes selected amounts to €528 million, of which only €211 million is contributed by the EU.
- The Euratom SARNET-2 Network of Excellence defines joint research programmes and develops common computer tools and methodologies for safety assessment of nuclear power plants. With an EU contribution of just €5.75 million out of a total budget of €38 million it generates for each €1 FP funding more than €6 additional research funding.

See Annex 1 for additional evidence on leverage effects

Box 9: Assessing the innovation impacts of EU research and innovation programmes

For firms, FP collaborative research projects are more than self-financed collaborative research projects focused on complex, long-term, risky exploration rather than short-term exploitation. Firms participate in the FP mainly to achieve knowledge- and technology-related objectives, less to achieve direct commercialisation-related objectives. FP projects are not and should not be assessed as stand-alone R&D activities; they form part of a wider portfolio of R&D projects. The FP nevertheless has a significant positive impact on innovation and competitiveness: FP-funded research produces large numbers of patents, innovations and micro-economic benefits. These innovation impacts were assessed on the basis of the following range of evidence:

National evaluations of EU programmes (Box 6)

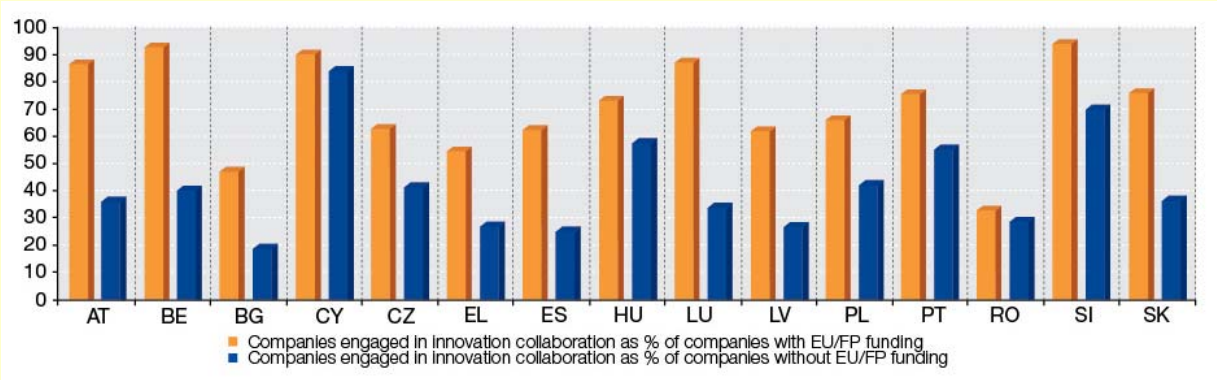
Cross-cutting EC ex-post evaluations of EU programmes

- For instance, according to the FP5&6 Innovation Impact study, a great majority of FP participants reported at least one form of commercialisable output (new or improved processes, products, services, standards) stemming from their FP project and a large number even recorded more than one of such outputs; an econometric analysis showed that the FP produces output additionality – a positive impact on the innovative sales of firms participating in the FP; and small and medium-sized enterprises indicated the most positive results in terms of innovation in FP projects.
- For instance, according to an FP6-wide survey (IDEA Consult, 2009c), industrial organisations clearly expected commercial returns. Almost half of them (47 percent) stated they were likely to very likely, and 60 percent of this group expected these returns within 2 years (90 percent within 5 years).

Statistical and econometric analyses of Community Innovation Survey micro-data

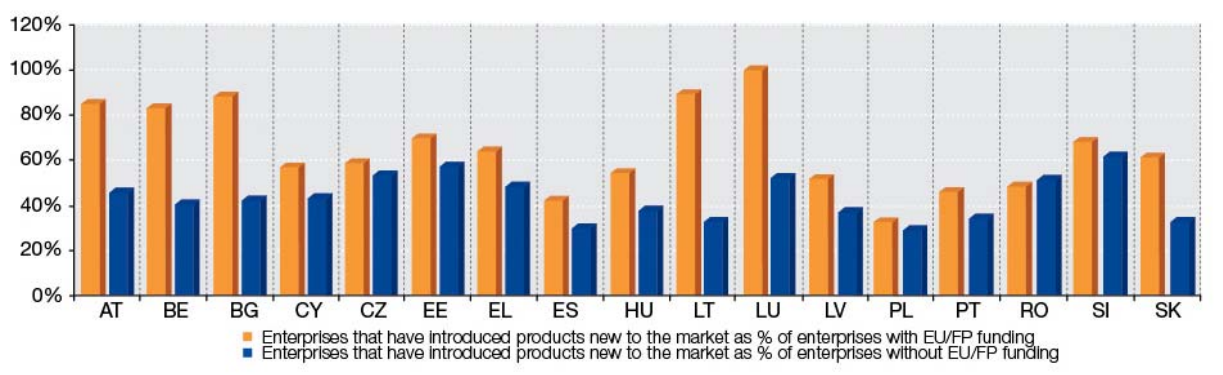
- In collaboration with DG Research & Innovation, JRC carried out a dedicated analysis of micro-data for 13 Member States available from the third round of the Community Innovation Survey. Data of the fourth and fifth rounds were of insufficient quality. Through a multi-equation model, the impact was assessed of FP funding on company R&D expenditure, on research and innovation collaboration, and on innovation. Key conclusions were that:
  - The FP increases total R&D investment: FP funding has a positive net effect on total company R&D expenditure meaning that when companies receive FP support, they do not just substitute for own R&D funding.
  - The FP promotes innovation: FP funding has a positive and statistically significant effect on companies' innovative sales and the impact is stronger for radical innovation (new to the market products) than for incremental innovation (new to the firm products).
  - The FP promotes collaboration: The positive effect of FP funding on R&D expenditure is partly due to the positive effect of FP funding on collaboration. The FP has positive and significant effects on company collaboration, not only at EU level (something required by the FP itself) both also at national and, more strongly, at international (beyond Europe) levels.
- In addition, Eurostat carried out in collaboration with DG Research & Innovation a dedicated analysis of 2006 Community Innovation Survey micro-data, which confirmed the above results by showing that FP participants collaborate more, patent more, and are more innovative than non-participants – see the figures below.

FP Participants collaborate more than non-participants



Source: Eurostat – Note: Data concern manufacturing sector

FP participants are more innovative than non-participants



Source: Eurostat – Note: Data concern manufacturing sector

Economic and competitiveness impacts

Economic and competitiveness impacts include impacts on GDP, productivity, exports, imports, etc. As discussed in detail in Box 10 and Annexes 1 and 5, the BAU option produces strong economic and competitiveness impacts, which through slightly better innovation impacts are slightly enhanced under the BAU+ option. Under the Horizon 2020 option, enhanced scientific, technological and innovation impacts in combination with the aforementioned clarity of focus and high quality intervention logic translate into larger downstream economic and competiveness impacts. The results for the Horizon 2020 option of the Nemesis econometric model point to strong macro-economic effects over and above the BAU option by 2030: +0.53 percent for GDP, +0.79 percent for exports, and -0.10 percent for imports. Comparing the positive effects of the Horizon 2020 option with the negative effects of the discontinuation option demonstrates its true added value: by 2030, Horizon 2020 is expected to generate an extra 0.92 percent (0.53+0.39) of GDP, 1.37 percent (0.79+0.58) of exports and -0.15 percent (0.10+0.05) of imports.

Social, environmental and EU policy impacts

Social impacts include impacts on numbers of jobs, employment conditions, and quality of life, impacts on social policy. Environmental impacts include impacts on environmental policy and direct environmental impacts. EU policy impacts concern the extent to which research results succeed in informing EU policy design.

As discussed in detail in Annex 1, the BAU option produces strong social, environmental and EU policy impacts. As for social impacts, according to a survey among FP5-7 project coordinators in the area of "Food, Agriculture and Fisheries, and Biotechnology" research,

close to 5 percent of all projects resulted directly in the creation of a new company. 82 percent of all projects created jobs for the duration of the project and 35 percent of all projects created new jobs after the end of the project. 38 percent of all projects created at least one permanent S&T job. According to a Dutch FP impact study (Technopolis, 2009), "the [FP's] impact on the human research capital in the Netherlands is considerable, with approximately 1200 researchers in the public sector alone funded by the FPs annually. For many research groups this is an important factor to guarantee the continuity of the group". According to an Irish evaluation of FP6 (Forfas, 2009), 80 percent of participating organisations or research groups improved their ability to attract staff or increased employment (low impact: 27%, medium impact: 42%, high impact: 11%). Through Marie Curie actions, the FP set a valuable benchmark for the working conditions and employment standards of EU-researchers (Annerberg et al., 2010). The FP also produces indirect social benefits through relevant natural sciences research. According to a FP6-wide participation survey (IDEA Consult, 2009c), all thematic priorities contribute substantially to a better quality of life while life sciences, genomics and biotechnology for health, nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices, and food quality and safety contribute to better healthcare. According to a Dutch FP impact study (Technopolis, 2009), "societal impact is demonstrated in domains with a strong societal mission such as health, sustainability and food safety". The FP also produces indirect social benefits through social sciences research on relevant issues. An evaluation of FP5 and FP6 social and environmental effects (European Commission, 2005) lists research on the following socially relevant issues: human rights, social cohesion, economic cohesion, employment, human capital formation, public health and safety, social protection and social services, liveable communities, culture, consumer interests, security, governance, international co-operation, role of SMEs.

The clearest environmental impacts are produced by FP-funded environmental research. According to an EC-commissioned evaluation of FP6 environmental research (EPEC, 2008), for instance, EU environmental research contributed to the knowledge base and development of methods and tools for environment related policy. The study found, for instance, that at the international level, EU research related to climate change contributed to the International Panel on Climate Change (IPCC), either directly, through individual researchers involved in the IPCC review, or through references to EU-funded projects in IPCC reports; that in the domain of environment and health, there were strong links with EU policy priorities, most notably with the implementation of the Environment and Health Action Plan 2004-2010 as well as with the implementation of European Directives; that water and soil projects played a large role in the formulation and implementation of the Water Framework Directive; and that earth observation projects had direct. impacts on policy-making through the use of their outcomes by stakeholders such as IPCC and WMO. Yet other kinds of FP-funded research also produce clear environmental impacts. According to a FP6-wide participation survey (IDEA Consult, 2009c), for instance, the thematic priorities "Sustainable development, global change and ecosystems" and "Nanotechnologies and nanosciences etc." contributed to the sustainable use or production of energy, while the thematic priorities "Sustainable development, global change and ecosystems", "Nanotechnologies and nanosciences", "Aeronautics and space", and "Food quality and safety" contributed to the environment. National evaluations of the FP arrive at similar conclusions. According to an Irish evaluation of the FP (Forfas, 2009), for instance, 50 percent of all projects made a contribution to "improved environmental preservation or protection". And a Swedish evaluation of the FP (VINNOVA, 2008) found that "Framework Programmes have positive effects on the behaviour of the research community, competitivity, jobs, regulation and the environment".

Under the Horizon 2020 option, enhanced scientific, technological and innovation impacts in combination with the aforementioned clarity of focus and high quality intervention logic translate into larger downstream social, environmental and EU policy impacts. The results for the Horizon 2020 option of the Nemesis econometric model, see Box 10, for instance, point to strong employment effects – +0.21 percent - over and above the BAU option by 2030. Comparing the positive effects of the Horizon 2020 option with the negative effects of the discontinuation option demonstrates its true added value: by 2030, Horizon 2020 is expected to generate an extra 0.40 (0.21+0.19) percent of employment.

Cost-effectiveness

Per euro disbursed, implementation costs are lower under the Horizon 2020 option than under the business-as-usual and common roof options because of far-reaching integration, simplification and harmonisation (common rules benefit stakeholders but also lower the Commission implementation cost), and externalisation. On the other hand, it is the Horizon 2020 option that maximises the benefits. Through its close integration of research, innovation and researcher training, the Horizon 2020 option assures best that investments made at EU level in research projects are fully valorised into patents and new products, processes and services. Under the business-as-usual and common roof options it is conceivable that because of a lack of research and innovation bridging mechanisms and dedicated innovation support, EU funded research projects are unable to valorise their research results into patents and new products, processes and services, which would amount to considerable losses with respect to the societal benefits that can be expected from such research projects.

Box 10: Assessing the macro-economic impacts of EU research and innovation programmes

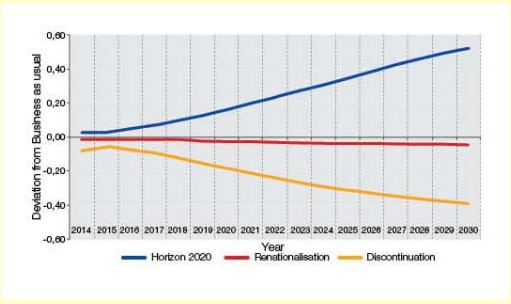
The aggregate macro-economic impacts of an expenditure programme can be assessed by making use of a mathematical model based on known, inferred, and assumed parameters. Over the past few years, the use of mathematical models for the ex-ant evaluation of policy effects increased significantly within the Commission, and also at national level. For the Horizon 2020 ex-ante impact assessment, use was made of three models: Nemesis, an OECD model and Quest III.

Nemesis is a macro-econometric model built by a Commission-funded consortium of European research institutes under the 5th Framework Programme. Nemesis has also been used by the Commission for the ex-ante impact assessment of FP7 and for assessing the macro-economic impacts of achieving the 3 percent objective, by the OECD, by a number of French government institutions, etc. For the Horizon 2020 impact assessment exercise, DG Research & Innovation developed in collaboration with the DEMETER consortium running Nemesis a number of scenarios including the Horizon 2020, renationalisation and discontinuation scenarios. The DEMETER consortium produced for each of these scenarios results on GDP, exports, imports, and employment through 2030 compared to the business-as-usual scenario. These results are presented in the figures below. Annex 5 provides more detail on the different Nemesis scenarios, the detailed and carefully considered and conservative assumptions underpinning them, and their results. The difference between the BAU and Horizon 2020 scenarios hinges mainly on the scale of EU research and innovation funding, and on the size of the crowding-in effect and the economic multiplier associated with the intervention. As explained in detail in the text and in Annex 5, because of simplification and therefore enhanced industrial participation, and because of closer knowledge triangle coordination and therefore enhanced valorisation of research results, crowding-in effects and economic multipliers can be assumed to be higher under Horizon 2020 than under BAU.

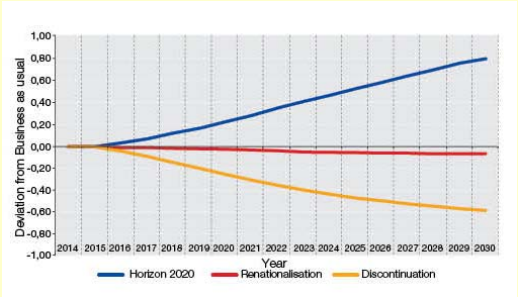
The OECD model was developed originally by Guellec and Van Pottelsberghe (2004) to assess the effect of public, business and foreign- performed R&D on the growth of total factor productivity (TFP) of industry. This model has been adapted by the Joint Research Centre in Ispra to estimate the effects of the Sixth and Seventh Framework Programmes on the growth of total factor productivity of the EU and associate countries. Results indicate that every 1€ invested by the FP generates on average 13€ in increased value added of the business sector. The impact of the FP on total factor productivity varies between countries, and depends, among other things, on the size of the country, its industry structure and its R&D structure (business versus public). Since these results are for FP6 and FP7, they shed some useful light on the impact of the Business as Usual option.

Simulations were also carried out using the Quest III model developed by DG Economic and Financial Affairs of the European Commission. This is a model used for macroeconomic policy analysis and research, and belongs to the class of New-Keynesian Dynamic Stochastic General Equilibrium (DSGE) models. Under assumptions that there is a new Horizon 2020 programme, that the EU Member States increase their investment in R&D in accordance with the Europe 2020 targets, and that they combined this with efforts to close the high-skilled education expenditure gap, then the resulting impact is an extra 2.34% of GDP by 2050, converging on a long run steady state addition of 5.64% of GDP.

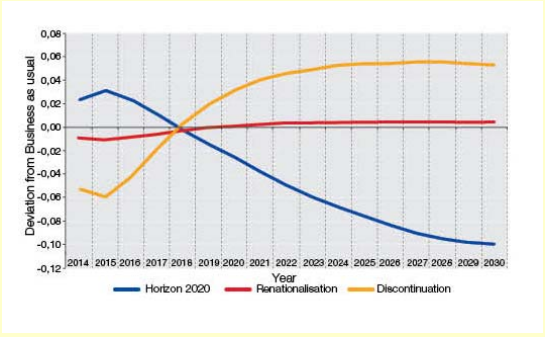
Impact of the different options on GDP



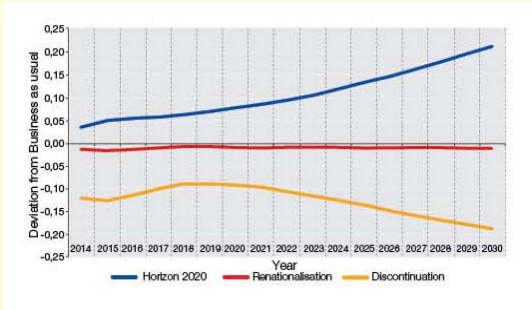
Impact of the different options on Exports



Impact of the different options on Imports



Impact of the different options on Employment



Three kinds of **costs** have to be taken account of with respect to the implementation of Horizon 2020:

- *Direct financial outlays from the EU budget or from other public funds*: A series of figures for the direct financial outlays relating to each option were used for the cost effectiveness analysis (see Annex 5 for full details). These included outlays from the EU budget for the period 2014 to 2020, and projected future outlays for 2021-2030. Assumptions were also made about the growth of national funding for research and innovation.
- *Administrative costs for the Commission*: Regarding administrative costs for the Commission of the options, a series of projections were made based on different assumptions regarding the simplification rules regarding EU research and innovation funding (see separate impact assessment on the Rules for Participation). These costs were considered for the scenarios BAU/BAU+ under which the existing Rules are applied without change, and for a scenario under which the Rules are simplified – as envisaged for Horizon 2020. This simplification would involve simplified cost-based funding (with simplified cost eligibility criteria and single reimbursement rate per project), combined with a flat rate on personnel costs for indirect costs.
- *Administrative costs for applicants and participants*: An analysis was also carried out on the effects of administrative simplification on the costs for applicants/participants of the different options (see separate impact assessment on the Rules for Participation). These participation costs do not consist only of "information requirements" or purely administrative tasks (form filling, financial accounting, etc). They represent the overall effort of the beneficiaries, i.e. they include also tasks such as developing the scientific-technical content of a proposal, adapting this content during the negotiation phase, managing the consortium or dealing with scientific reporting, ethics, gender, dissemination and stakeholders involvement at project implementation phase. It can be seen from the separate impact assessment on the Rules for Participation that under the simplified Rules envisaged for Horizon 2020, the costs to participants are reduced substantially (by around 15% to 20%).

As detailed above, **benefits** are maximised under the Horizon 2020 option. In particular, compared with the other options, Horizon 2020 would:

- Provide greater effectiveness by maximising structuring and leverage effects through large-scale simplification, thereby maximising the programme's attractiveness to industry, science-industry linkages, and private sector crowding-in, and through the greater use of structuring instruments; maximising critical mass at programme and project level; enhancing the promotion of scientific and technological excellence and providing stronger benefits to SMEs notably from administrative simplification and also from closer knowledge triangle coordination, particularly concerning research and innovation finance; enhancing S&T and innovation impacts through the seamless support from idea to marketable product, stronger output orientation, better dissemination of research results, clearer technological objectives, enhanced industrial and SME participation and thus higher leverage, the funding of demonstration activities, and innovation financing and support; producing larger downstream economic, competiveness and social impacts, as well as environmental and EU policy impacts.
- Improve efficiency by reducing levels of administrative costs for the Commission; and reducing the administrative burden for participants, significantly improving accessibility

- Offer greater coherence by enhancing the coordination of knowledge triangle and broader policies through a single framework seamlessly integrating research, education and innovation aspects and explicitly defining links with other policies; and allowing for more flexibility.

The issue of cost effectiveness has also been taken into account in the design of the instruments for Horizon 2020. One of the key criteria for designing the toolbox of instruments has been the need to link closely with the objectives, and in particular to increase the exploitation of the results of research. New instruments have been introduced and existing instruments have been simplified. The overall number of instruments has been reduced with a view to further rationalise and simplify support measures. This should facilitate the management of projects, and the use of harmonised rules should reduce the burden on participants (see the cost estimates above).

Under previous EU programmes, the evaluation of instruments has yielded important insights, and has led to improvements (for example, the adaptations following the reviews of networks of excellence and integrated projects). It is therefore envisaged that the instruments of Horizon 2020 would be subject to monitoring and evaluation, in order to ensure that the lessons from implementation are indentified and that the instruments may adapt over time to increase their efficiency and effectiveness.

The conclusion of our assessment is that Horizon 2020 offers the greatest returns per euro invested in terms of efficiency, effectiveness and coherence.

5.4. Choosing the preferred option

Based on the aforementioned comprehensive in-depth comparison of the policy options, it emerges that the Horizon 2020 option would be the most appropriate policy option, the preferred option, to achieve the objectives formulated in Chapter 3. Table 1 summarises the comparison of the BAU+, Horizon 2020, and renationalisation options with the BAU option.

Compared to the BAU, option, the Horizon 2020 option would have clarity of focus and benefit from a well-developed intervention logic. Like the business-as-usual option, it would achieve critical mass at programme and project level. At the same time, it would enhance the promotion of scientific and technological excellence and allow for more flexibility. Administrative costs for applicants and participants would be reduced drastically, which would improve significantly accessibility, in particular for SMEs, and increase levels of support from all types of stakeholders. Knowledge triangle and broader horizontal policy coordination would be enhanced through a single framework integrating in a seamless manner research, innovation, and researcher training and skills development and explicitly defining links with other policies. Scientific, technological and innovation impacts would be enhanced through the provision of seamless support from scientific idea to marketable product, a stronger output orientation, a better dissemination of research results, clearer technological objectives, enhanced industrial and SME participation and thus enhanced leverage, the funding of demonstration activities, and the provision of innovation financing and support. In combination with the aforementioned clarity of focus and high quality intervention logic, enhanced scientific, technological and innovation impacts would translate into larger downstream economic and competiveness, social, environmental and EU policy impacts.

Table 1 - Summary comparison of cost effectiveness, efficiency and coherence of options

Dimension	BAU+	Horizon 2020	Renationalisation
Effectiveness			
Focus	+	++	+(1)
Intervention logic	=	+	+/-(2)
Accessibility, reach	+	++	++(4)
SMEs	+	++	++(5)
Excellence	=	+	-
Critical mass	=	=	-
Structuring effect	+	++	-
Leverage effect	+	++	-
Innovation impact	+	++	-
Economic and competitiveness impact	+	++	-
Social impact	+	++	-
Environmental impact	+	++	-
Impact on EU policy	+	++	-
Efficiency			
Reduction of administrative costs	+	++	++(3)
Reduction of participation costs	+	++	++(3)
Coherence			
Knowledge triangle coordination	+	++	+/-(2)
Broader horizontal policy coordination	=	+	+/-(2)
Flexibility	=	+	++(3)

Notes: (1) Easier to focus programmes, but more difficult to focus them on pan-European objectives; (2) In theory, easier to achieve/enhance; in practice, mixed Member State and regional performance; (3) but reduced critical mass, excellence; (4) but reduced critical mass and ability to pool resources; (5) but reduced access to foreign partners, capabilities, markets.

The BAU+ option would allow for some alignment of objectives and achieve a certain measure of measure of simplification producing positive feedback effects on administrative burden, accessibility, reach, structuring effects, leverage effects, innovation impacts and downstream economic, social, environmental and EU policy impacts.

In the case of the renationalisation option, it would be more difficult to orient European research and innovation programmes to commonly agreed objectives. In theory, it would be easier to enhance the quality of the intervention logic, the level of flexibility, accessibility and reach, and the extent of knowledge triangle and broader horizontal policy coordination but in practice this is not the case and there would be important trade-offs. EU initiatives that

fundamentally restructure the European R&D landscape would not be taken. Research that only takes place through EU-funded collaborative research projects would not take place. In the aggregate, this would compromise the return on investment in research as scientific, technological and innovation impacts would be reduced, which would translate into smaller economic and competitiveness, social, environmental and EU policy impacts.

5.5. Details on the implementation of Horizon 2020

Structured around 3 priorities

As mentioned in the previous chapter, Horizon 2020 is structured around three complementary and interlinked priorities: (1) Excellent Science; (2) Industrial Leadership; (3) Societal Challenges:

- Raising and spreading the levels of "**Excellent Science**" is necessary to underpin future EU competitiveness and wellbeing. This block is designed to meet the needs of the scientific community, and to develop talent within Europe and attract leading researchers to Europe. The priorities will be largely identified by scientists. This block shall cover (i) the European Research Council; (ii) Future and emerging technologies; (iii) Marie Curie actions; and (iv) Research infrastructures. These instruments have so far produced clear European added value and high impact. Their added value derives from: EU-wide competition for excellence; the pooling of pan-European knowledge and financial resources so as to achieve critical mass in the construction, exploitation and transnational use of (new) research infrastructures; and the efficient organisation of large-scale cross-border and cross-sectoral researcher mobility. All instruments respond to the Innovation Union political commitments, and aim at creating an attractive and world class research base in Europe.
- "**Industrial Leadership**" should support entrepreneurs and innovative companies focusing on research and innovation to achieve industrial leadership in key enabling technologies. It will also address important market failures such as private sector under-investment in R&D and insufficient financing for growth of innovative SMEs and for early stage eco-innovative companies in Europe through the following actions: (a) Leadership in enabling and industrial technologies of ICT, nanotechnology, advanced materials, biotechnology, advanced manufacturing and processing and space; (b) Access to risk finance; (c) Innovation in SMEs. This block will be designed to boost industrial competitiveness by stimulating the business and SME community towards more innovation efforts including by developing a strategic alignment between EU and private resources (e.g. through Joint Technology Initiatives). The new debt and equity financial instruments (designed in compliance with EU debt and equity platforms) will play a key role in leveraging private commitments. Available for the implementation of all parts of Horizon 2020, as well as for any EU policy with a research and innovation dimension, these financial instruments will also be supported by a set of accompanying measures in view of creating a more innovation and investment-friendly ecosystem.
- Focusing resources for "**Societal Challenges**" responds directly to the major challenges identified in the Europe 2020 strategy and flagship initiatives. This block will support activities from research to market, including: R&D projects, applications of key technologies (e.g. ICT, bio, nano), pilot and demonstration projects, market uptake and replication projects, public procurement of innovative products, processes and services, appropriate support for standardisation and regulatory activities as well as innovation inducement prizes. EU-level action is imperative in order to build the **critical mass** of resources and competences required for addressing the pan-European and often global

challenges, to bring together the necessary broad range of actors (governments, business, academia, users) from different countries, sectors and perspectives, and to link closely to EU policies. To maximise impact there will be a strict focus on a limited number of major challenges that "speak" to the citizen. The research and innovation agendas compiled to meet these challenges must serve the policy objectives at EU level (energy, transport, health, environment, etc.). Where appropriate, efforts will be pooled with Member States, international and/or private partners. The European Institute of Innovation and Technology (EIT) will pool together with different initiatives funded under Horizon 2020 to enhance the synergies and impact of the EU action.

In addition, to these three priorities, Horizon 2020 comprises two additional parts supporting those three priorities: JRC non-nuclear direct actions and EIT.

Focused on 6 societal challenges

In particular in its priority "Societal Challenges", Horizon 2020 will focus on the resolution of six societal challenges: (i) health, demographic change and wellbeing; (ii) food security, sustainable agriculture, marine and maritime research and the bio-economy; (iii) secure, clean and efficient energy; (iv) smart, green and integrated transport; (v) climate action, resource efficiency and raw materials; and (vi) inclusive, innovative and secure societies.

These societal challenges have been identified on the basis of the following criteria: (1) corresponding to the major challenges facing Europe as identified in Europe 2020 and the MFF Communication on the basis of sectoral policy analyses, and lending clarity and visibility to EU intervention; (2) corresponding to the concerns of Europe's citizens and being understandable by them; (3) corresponding to demands expressed by Member States as well as other public and private actors of the European R&I system; and (5) balancing continuity and change, investing in areas of strength and investing in areas of relative weakness where Europe has to catch up (i.e. European R&I weakness with regard to competitors), alignment and complementarity with the priorities of the Member States. This identification thus builds on the interim and ex-post evaluations of Community interventions, and on analyses of the strengths and weaknesses of European R&I across disciplines and S&T domains, and is set in the context of the Europe 2020 strategy.

With respect to previous and current programmes' thematic priorities, the differences are not necessarily in the basic coverage of scientific disciplines but in the inter-disciplinary articulation of the challenges; in the priorities which have changed within each broad area; and in the objectives-oriented research and innovation. Some domains (previous and current programmes' thematic priorities) will be scaled back, thanks to the integrated approach offered by the common framework, which enables to look at the full landscape of tools and interventions. Thus for instance the domain of cultural heritage will be downscaled in the programme. It is being taken up in Joint Programming activities. Other forms of intervention will be taken out altogether, based on in-depth interim (e.g. FP7) and ex-post (e.g. FP6) evaluations which have allowed to rethink and revise the support approach. This is the case for some forms of SMEs funding and for the Networks of Excellence.

Below we detail the content of each challenge as well as its associated objectives:

- *Health, demographic change and well-being*: The challenge is to improve the life-long health and well-being of all while maintaining economically sustainable care systems. EU objectives will focus on disease prevention through the development of effective preventive tools (e.g. vaccines), effective health and disease surveillance and preparedness, and effective screening programmes. This will enhance effective health

promotion, supported by a robust evidence base, which improves well-being and is cost effective. There will be support for activities aiming at understanding disease and improving diagnosis in order to better prevent, manage, treat and cure diseases. Effective data-sharing with strong international focus and linking data with large-scale cohort studies will be essential, as will be the translation of research findings into the clinic, in particular through the conduct of clinical trials. Efforts will be deployed to improve decision-making in prevention and treatment, to identify and support the dissemination of best practices in the health and care sectors, and to support integrated care and the wide uptake of technological and organisational innovations empowering in particular older persons as well as disabled persons to remain active and independent. Doing so will contribute to increasing, and lengthening the duration of, their physical, social, and mental well-being.

- *Food security, sustainable agriculture, marine and maritime research and the bio-economy*: The challenge is to secure sustainable supplies of safe and high-quality food and other bio-based products, by providing productive, resource-efficient and resilient production systems, while accelerating the conversion towards low-carbon, resource-efficient and sustainable bio-based European industries. EU activities will be focused on: "Sustainable Agriculture and Forestry", aiming for more productive, resource-efficient and resilient agriculture and forestry systems in order to supply sufficient food and bio-materials without compromising natural resources; "Safe and Sustainable Food and Healthy Diets", aiming to meet the demands of citizens for safe, healthy and affordable food, and to make the food and feed industry more sustainable and more competitive; "Unlocking the Potential of Aquatic Living Resources", aiming to optimise the contribution to secure food supplies by developing sustainable and environmentally friendly fisheries and competitive European aquaculture in the context of the global economy and to boost marine innovation through biotechnology to fuel smart "blue" growth; and "Sustainable and Competitive Bio-based Industries", aiming to promote low carbon, resource efficient, sustainable and competitive European bio-based industries. Specific objectives are to transforming conventional industrial processes and products into bio-based resource and energy efficient ones, the development of integrated biorefineries, utilising biomass from primary production, biowaste and bio-based industry by-products, and opening new markets through supporting standardisation, regulatory and demonstration/field trial activities and others.

- *Secure, clean and efficient energy*: The challenge is to ensure the transition to a reliable, sustainable and competitive energy system, in the face of increasing resource scarcity, increasing energy needs and climate change. This will be achieved through several broad lines of actions: "Reduction of energy consumption and carbon footprint through smart and sustainable usage" will consist of research and testing at full scale of new concepts, non-technological solutions, more efficient and affordable technology components and systems with in-built intelligence, to allow real time energy management for near zero emission buildings, renewable heating and cooling, highly efficient industries and mass take up of energy efficiency solutions, as well as fostering EU smart cities; "Low cost, low carbon electricity supply & single European electricity grid" will consist of the development of innovative renewables and carbon capture and storage technologies of larger scale, lower cost and environmentally safe, as well as new, smart electricity grid technologies, systems and market designs to plan, monitor, control and safely operate interoperable networks in an open and competitive market; "Alternative fuels and mobile energy sources" will aim to make bio-energy more competitive and sustainable, to reduce time-to-market of hydrogen and fuel cells and to bring new options with long term

potential to maturity. In addition, there will be support for multi-disciplinarily research for future and emerging energy technologies and joint realisation of pan-European research programmes and world-class facilities as well as support of socio-economic research for public acceptance and engagement, user involvement and economic, social and environmental sustainability; development of tools, and methods and models for a robust and transparent policy support.

- *Smart, green and integrated transport*: The challenge is to achieve a European transport system that is resource-efficient, environmentally-friendly, safe and seamless for the benefit of citizens, the economy and society. The purpose of EU support is to minimise transport's impact on climate and the environment by improving its efficiency in the use of natural resources, and by reducing its dependence on fossil fuels through specific objectives like reducing resource consumption and greenhouse gas emissions and improving vehicle efficiency; accelerating the development and deployment of a new generation of electric and other low or zero emission vehicles, including through breakthroughs in engines, batteries and infrastructure; exploring and exploiting the potential of alternative fuels; optimising the use of infrastructures, by means of intelligent transport systems and smart equipment; and increasing the use of demand management and public transport, particularly in urban areas. Another EU objective is to reconcile growing mobility needs with improved transport fluidity, through innovative solutions for seamless, inclusive, safe, secure and robust transport systems and specific objectives like reducing congestion, improving accessibility and matching user needs by promoting integrated door-to-door transport and logistics; enhancing inter-modality and the deployment of smart planning and management solutions; and drastically reducing the occurrence of accidents. Another objective is to reinforce the competitiveness and performance of European transport industries through specific objectives like developing the next generation of innovative transport means and preparing the ground for the following one and working on novel concepts and designs, smart control systems and interoperable standards, efficient production processes, shorter development times and reduced lifecycle costs. Horizon 2020 will also support improved policy making which is necessary to promote innovation and meet the challenges raised by transport. Specific objectives are to improve the understanding of transport related socio-economic trends and prospects, and provide policy makers with evidence-based data and analyses.
- *Climate action, resource efficiency and raw materials*: The challenge is to achieve a resource efficient and climate change resilient economy that meets the needs of a growing global population within the natural limits of a finite planet. Tackling this challenge will focus on the development of climate change adaptation and mitigation measures through the generation of evidence for informed, early and effective action and the networking of the required competences. Specific objectives will focus on: improving the understanding of climate change and the provision of reliable climate projections; assessing impacts, vulnerabilities and developing innovative cost-effective adaptation measures; supporting mitigation policies. Another objective will be to provide knowledge for the management of natural resources that achieves a sustainable balance between limited resources and the needs of society. Specific objectives will focus on: furthering our understanding of the functioning of ecosystems, their interactions with social systems and their role in sustaining the economy and human well-being; and providing knowledge and tools for effective decision making and public engagement. EU action will also try to provide innovative solutions for a sustainable supply of raw materials and for their substitution by economically attractive alternatives. Specific objectives will focus on: improving the understanding of the availability of raw materials; promoting their sustainable supply and

use; and finding alternatives for critical raw materials. All forms of eco-innovation that enable the transition to a green economy will be supported. Specific objectives will focus on: strengthening eco-innovative technologies, services and products and enhancing their market uptake; supporting innovative policies and societal change; measuring and assessing progress towards a green economy; and fostering resource efficiency through digital systems. The last objective is to ensure the delivery of the long-term data and information required to address this challenge, i.e. data infrastructures for earth observation and monitoring that provide timely, accurate information, forecasts and projections. Free, open and unrestricted access to interoperable data will be encouraged.

- *Inclusive, innovative and secure societies*: The challenge is to foster inclusive, innovative and secure European societies in a context of unprecedented transformations and growing global interdependencies. The objective of "Inclusive societies" is to support policymakers in designing policies that prevent the increase in inequalities as well as the development of various forms of divisions in European societies and with other world regions. This will be achieved through: building resilient and integrative societies in Europe; generating smart, sustainable and inclusive growth; closing the research and innovation divide in Europe; strengthening Europe's role as a global actor; and promoting digital inclusiveness. The objective of "Innovative societies" is to foster the development of innovative societies and policies in Europe through the engagement of citizens and users in R&I and the promotion of coordinated R&I policies in the context of globalisation. This will be achieved through: support social and user-driven innovation and creativity; promote smart digital public services in Europe; strengthen the evidence base for the Innovation Union and the European Research Area; and promote coherent and effective cooperation with third countries. The objective of "Secure societies" is to support EU policies for internal and external security and to ensure cyber security, trust and privacy in the Digital Single Market. This will be done by developing solutions that address security gaps and lead to the prevention of security threats. Specific objectives are to: prevent and combat serious and organised crime; increase the security of infrastructures and utilities; fighting crime and terrorism; manage crises and disasters; integrate civilian and military capabilities; increasing trust in digital societies and tackle cyber security; and coordinate and structure the research security area in Europe.

Allocating financial resources optimally

Under Horizon 2020, only those kinds of activities will be supported that have passed the European added value test. Under the proposal on the next MFF (EC, 2011e), the funding for Horizon 2020 amounts to €80 billion (constant 2011 prices), which represents a 46 percent increase with respect to comparable funding under the MFF 2007-2013 (constant 2011 prices). The allocation of the Horizon 2020 budget across its three priorities and two additional parts is closely linked to the achievement of the aforementioned objectives. The largest share of the Horizon 2020 budget, between 40 and 50 percent, will be assigned to "Societal Challenges". The reason is that this priority contributes most directly to the achievement of the Europe 2020 objectives, that investment in applied research tightly focused on societal challenges will generate the quickest and broadest societal and economic returns, and that this priority meets most explicitly the short- to medium-term concerns of Europe's citizens, its Member States, and the EU. The feasibility of allocating a much larger share of the budget (60-70 percent) to "Societal Challenges" was considered but rejected since this would negatively affect Europe's generic long-term (basic research) and short-term (applied research) research and innovation capabilities and therefore the achievement of the

objectives "Strengthen Europe's science base" and "Boost Europe's industrial competitiveness through promoting technological leadership and getting good ideas to market".

The remainder of the budget will be divided more or less equally between the highly complementary "Excellent Science" and "Industrial Leadership" priorities, and therefore between intricately linked basic research and generic applied research, and between closely associated scientific excellence and industrial innovation and competitiveness, strengthening the whole innovation cycle. The feasibility of favouring one of those two tightly related priorities over the other in terms of budget share was considered but rejected since capabilities have to be balanced across the whole innovation cycle. Favouring "Excellent Science" over "Industrial Leadership" would compromise Europe's shorter-term innovation capabilities while the reverse would negative affect Europe's longer-term competitiveness.

As regards the allocation of the Horizon 2020 budget within each priority, this has been based on the following carefully considered criteria. Investment is focused on those activities and areas that have the greatest potential in terms of (1) quickly improving the everyday lives of European citizens and maximising value for money; (2) rapidly reducing escalating costs for European citizens, businesses and governments (e.g. health care, energy); (3) swiftly creating new market and employment opportunities for European businesses and citizens; (4) improving Europe's investment and performance position with respect to established and emerging competitors and maximising synergies with the Member States; (5) addressing problems of research and innovation fragmentation and lack of critical mass and maximising economies of scale, scope and complementarity; (6) leveraging public and private resources; (7) addressing specific research and innovation financing needs (e.g. to bridge the so-called "valley of death"); and (8) reducing over-subscription rates.

From research to innovation, from idea to market - Providing "seamless support"

Innovation is a complex, diversified activity with many interacting components. Many attempts have been made to construct models to shed light on the way innovation is generated within firms, and how it is influenced by what goes on outside firms. One useful approach is the “chain-link model” (Kline and Rosenberg), which conceptualises innovation in terms of interaction between market opportunities and the firm’s knowledge base and capabilities. Each broad function involves a number of sub-processes, and their outcomes are highly uncertain. Accordingly, there is no simple progression; it is often necessary to go back to earlier stages in order to overcome difficulties in development. This means feedback between all parts of the process. A key element in determining the success (or failure) of an innovation project is the extent to which firms manage to maintain effective links between phases of the innovation process: the model emphasizes, for instance, the central importance of continuous interaction between marketing and the invention/design stages. In the chain-link model, research is viewed not as a source of inventive ideas but as a form of problem-solving, to be called upon at any point. When problems arise in the innovation process, as they are bound to do, a firm draws on its knowledge base at that particular time, which is made up of earlier research findings and technical and practical experience. The research system takes up the difficulties which cannot be settled with the existing knowledge base, and so extends it if successful.

In Horizon 2020, the "seamless support from research to innovation, from idea to market" is operationalised through a number of flexible funding schemes (research and innovation grants; training and mobility grants; programme co-funding grants; grants to public procurement of innovation; support grants; debt finance and equity investments; prizes; and procurement) that, compared to current EU interventions in the field of research and

innovation, increase the emphasis on research project output; pro-actively support research result dissemination, demonstration, and piloting; strengthen support for market take-up; fund projects that cover a number of stages in the innovation chain; support SME research and innovation throughout; and comprise supply as well as demand measures:

- *Research and innovation grant*: funding in order to undertake projects of all sizes and types. The project may cover all or some parts of the full range of research and innovation activities, including fundamental research, industrial R&D, training, mobility and career development, prototyping and design, dissemination, demonstration, pilots, testing and user involvement, market replication, support to research and innovation infrastructures, standard setting, networking and coordination. [It may be used to support programmatic approaches which would combine some or all of the activities mentioned above and which would include consortia selecting, on a competitive basis, the appropriate third parties to carry out part or all of these activities note – subject to legal check]. It may also include funding to support public procurement contracting authorities to undertake pre-commercial procurement or public procurement of innovative solutions (as defined below), including co-funding the budget of specific calls that have a high EU added value. Research and innovation grants shall be the principal funding scheme in Horizon 2020. They may be used to target specific categories of participants such as SMEs or participants from third countries.
- *Training and mobility grant*: funding to single beneficiaries, funding bodies or trans-national consortia to undertake projects or activities specifically relating to training, mobility and career development of researchers. This funding scheme shall be used in particular for the implementation of the Marie Curie Actions.
- *Programme co-funding*: funding to bodies managing research and innovation programmes. The activities to be supported include networking and coordination between programmes in different countries, as well as co-funding the budget of specific calls and actions that have a trans-national nature. The types of programmes may include: R&D programmes, innovation support services, researcher training, mobility and career development programmes. Programme co-funding may be used to support public-public partnerships and programme level cooperation with third countries or programmes managed by international organisations.
- *Coordination and support grant*: funding for accompanying measures, notably: dissemination, awareness raising and communication actions; networking, coordination or support services; policy dialogues and mutual learning exercises and expert support (for instance for evaluation, assessment or review), studies (including design studies for new infrastructure).
- *Debt finance and equity investments*: in research and innovation, as set out in Annex I under "access to risk capital".
- *Prizes*: Prizes may take the form either of a reward for past achievements or of inducement prizes to be awarded for the achievement of a pre-specified target.
- *Procurement*: contracts in order to obtain, against payment of a price the supply of movable or immovable assets, the execution of works or the provision of services. This may include: (1) Public pre-commercial procurement, which is an approach to procuring R&D services which involves risk-benefit sharing under market conditions, and competitive development in phases, where there is a separation of the R&D phase from deployment of commercial volumes of end-products; (2) Public procurement of innovative solutions, which refers to the case where contracting authorities act as a launch

customer for innovative goods or services which are not yet available on a large-scale commercial basis, and may include conformance testing.

In the design of these instruments, special attention has been paid to the consistency between the objectives pursued and the eligibility criteria and other conditionality provisions for participation analysed in the other IA report on the Rules for Participation.

Linking with other policies

The Commission Communication on the next MFF, EU's future financial framework, has underlined that boosting research and innovation performance is the only way for Europe to support sustainable growth and create good and well-paid jobs that will withstand the pressures of globalization. Horizon 2020 will bring together all EU research and innovation-related instruments in an overarching integrated framework with a single set of Rules for Participation. Horizon 2020 has clear links with other major EU programmes and multiple interfaces are envisaged.

Horizon 2020 intends to make participation in EU research and innovation programmes more simple and attractive, in particular for small and medium sized enterprises (SMEs), facilitate their access to financing and help them ultimately bring the fruits of their innovation to market. As such, there are close links between Horizon 2020 and the proposed new programme for **European Competitiveness and SMEs**. The National Contact Points for SMEs will be built into the Enterprise Europe Network and facilitate diffusion of information as well as collection of feedback from participants and stakeholders. Sharing a broad concept of innovation underlying both Horizon 2020 and the European Competitiveness and SMEs programmes, the focus of the first one will be predominantly on innovative SMEs whereas the latter programme will target non-innovative SMEs.

With sustainable economic growth increasingly related to the capacity of regional economies to change and to innovate, future **Cohesion Policy** funds will put a much greater effort into creating a regional environment that encourages innovation and research and development through support for capacity building. The Cohesion policy funds will take forward the concept of "smart" specialisation and include measures aimed at creating a stairway to excellence for researchers, innovators, institutions and businesses. This will allow less favoured regions to fully engage with Horizon 2020 by enabling regional actors to enter transnational R&I collaborations. In return, these actors bring home new knowledge and access to new networks which will strengthen regional excellence and will facilitate regional research and innovation capacity building and strategy development. The R&I family of DGs will be closely involved in the development of both smart specialisation (through the Smart Specialisation Platform) and the implementation of the staircase to excellence through the detailed provisions of the programming documents, and notably the Operational Programmes. In addition, Horizon 2020 will complement these actions through targeted measures ensuring better coordination, cooperation and information exchange between the two EU funding programmes, for instance by promoting contacts between the National Contact Points for Horizon 2020 and the Structural Funds' Managing Authorities or by a more pro-active communication towards regional authorities on projects submitted and/or funded through Horizon 2020. Measures such as policy learning, networking and twinning schemes will enhance the connections between researchers, innovators and their institutions in all Member States and regions.

Stronger interfaces will also be developed with the future **Common Agricultural Policy**, where innovation is foreseen as an important component of rural development. The future Common Agricultural Policy of the EU continues with further reforms freeing up funds to

promote internationally competitive quality foodstuffs, innovation in farming and food processing, as well as sustainable rural development, including the diversification of rural economies. Horizon 2020 will support these policy objectives through funding research and innovation projects that support innovation in agriculture (such as finding way to use by-products of agricultural crops and waste products to produce energy), help find solutions to diseases, and make farming more environmentally friendly and more in line with consumers' preferences. Horizon 2020 will put in place take-up measures (e.g. dissemination) allowing to valorise better research results. Along the same lines, interfaces will also be reinforced with the **Common Fisheries Policy** which already contains specific elements for strengthening innovation.

Future **Education programmes** (e.g. mobility schemes, skills and competence development, life long learning, universities, doctoral programmes, etc.) will benefit from the potential to share implementation tasks (e.g. a one stop shop for mobility programmes) and an enhanced role for the EIT (with its mission of integrating education, research and innovation) within Horizon 2020.

Complementarities and synergies will be further developed with the **External policy instruments** (enlargement, neighbourhood and development) with the latter continuing to support capacity building that is necessary to enable third countries and regions to engage more effectively in collaborative research under Horizon 2020, particularly that addressing societal challenges of common interest.

The continuation with joint programmes under Article 185 of the Treaty, and joint undertakings under Article 187 of the Treaty under Horizon 2020, based on a clear set of criteria, will link existing programmes at **Member State level** with EU policies in the area of research and innovation. As they represent initiatives where Member States have jointly decided to pool their resources, Horizon 2020 will support Joint Programming Initiatives (JPI) in the development of their Strategic Research Agendas through coordination and support measures. Where the challenge addressed by a JPI is clearly in line with the priorities of Horizon 2020, its instruments may be used to provide further support, for instance through the ERA-NET scheme or through the co-funding of national programmes. New initiatives on the basis of Article 185 will only be considered when a JPI has demonstrated its capacity for significant collaboration and the necessary scale and scope to support the full integration of national programmes. Building on the experience of the Public Private Partnerships under the EU economic recovery plan, the possibilities for establishing such Partnerships without recourse to new legislative procedures has also been strengthened. This will allow such initiatives to be implemented in a streamlined manner while ensuring a greater clarity of roles and responsibilities.

5.6. Risks and risk mitigation strategies for Horizon 2020

The various impacts estimated above are those that can be achieved if Horizon 2020 is implemented successfully. But these are not guaranteed. In order for Horizon 2020 to tap its full potential, a number of conditions have to be met and a number of risks have to be mitigated:

- **Simplification**: Ongoing efforts to simplify the administrative requirements for Horizon 2020 must be followed through (these measures are addressed in the separate impact assessment on the rules for participation). They will be crucial in reducing barriers-to-entry, especially for small and medium enterprises and for participants from the new Member States. It should thus bring in new capabilities and ideas, and reduce the concentration of participation and the rigidity of networks. It will have a positive impact on dissemination and valorisation. It will also help to reverse the decreasing support of a sizeable share of the

scientific and innovation community who participated in past programmes and initiatives. The results of simplification need to be monitored closely to ensure that measures taken are effective. A key milestone will be the Horizon 2020 interim evaluation planned for 2017, which will address the key issue of programme implementation. Simplification should be seen to be bearing fruit by then.

- **Partnership and commitment from all actors**: The Commission plays an important role when it comes to managing Horizon 2020 and implementing simplification efforts. But it is not only the Commission which will determine whether Horizon 2020 will achieve the maximum impacts. Its success will also depend on the research and innovation community itself – on its readiness to master the application and participation procedures; on industry – on its awareness of the opportunities offered by Horizon 2020; and finally, on the national and regional authorities which collaborate with the Commission to construct conducive framework conditions.
- **Programme management**: The various management arrangements proposed for Horizon 2020 must deliver. The Commission has successfully managed programmes and initiatives in the past, but it has never had to manage a programme of such a scale and such a scope. Externalisation will be scaled up, with all that it entails in terms of locating premises, hiring staff, establishing procedures, and so on. Appropriate collaboration arrangements must also be put in place between the different Directorates-General involved in implementing Horizon 2020.
- **Seamless support**: It is one thing to draw up a rich portfolio of flexible funding schemes that could provide seamless support from research to innovation and from idea to market. It is quite another issue to make sure that these instruments work in practice, and that appropriate transfer mechanisms are established between the different Horizon 2020 priorities and between different funding schemes so as to make seamless support a reality.
- **Knowledge triangle coordination**: Horizon 2020 does not encompass the full knowledge triangle of research, innovation and education. Substantial amounts of research and innovation funding are disbursed through the structural funds. Horizon 2020 does not cover education policies beyond the EIT. Nor does it cover IPR policy per se. It is therefore of crucial importance that appropriate interfaces are established with those Directorates-General, policies, programmes and initiatives that concern knowledge triangle issues outside the scope of Horizon 2020.
- **Broader horizontal policy coordination**: Direct support programmes in the field of research, innovation and researcher skill development should be coordinated not only with other knowledge triangle actors, policies, programmes and initiatives but also with sectoral ones, particularly given the focus of Horizon 2020 on the resolution of societal challenges. It is therefore of key importance that appropriate collaboration arrangements are established with those Directorates-General, policies, programmes and initiatives dealing with the sectoral policies addressed by Horizon 2020 but also with, for instance, industrial policy, competition policy (to facilitate market entry of new players), tax policy (to change incentives and thereby business models and consumption behaviour), etc.
- **Member States**: Critical and emerging technologies cannot be produced through EU level research and innovation support alone. EU funding and Member State funding have to work in tandem. It is of critical importance that Member States engage in smart fiscal consolidation that ring-fences investments in research, innovation and education and safeguards Europe's long-term innovation capabilities.

- **Programme responsiveness and the adaptability**: Horizon 2020 will run over seven years, a very long period of time in the world of science, technology and innovation. New societal challenges may emerge, and so may new scientific disciplines, thematic priorities, and topics. Content-related flexibility is built into Horizon 2020. But being able to make the correct choices at the most appropriate moments will depend on having the required strategic intelligence at one's fingertips. This means strengthening linkages with the scientific community and society at large, as well as developing a strong internal monitoring and analytical capability.

The Horizon 2020 monitoring system can play a key role in the mitigation of implementation risk. In view of the implementation of Horizon 2020, this is being revised, as explained in the next chapter. The success of Horizon 2020, on the other hand, will have to be judged on the basis of a thorough evaluation. This requires an ambitious and strong Horizon 2020 evaluation system matching the ambition of Horizon 2020 itself. Initiatives being taken in this regard and explained in the next chapter have to be achieved.

6. EVALUATION AND MONITORING

6.1. Purpose of Horizon 2020 monitoring and evaluation system

To achieve the objectives set out in Chapter 3 it is vital to put in place an appropriate system for policy and programme evaluation and monitoring.

While this system can usefully integrate some elements from the current system for FP7, it needs to undergo a fundamental revision in order to enhance its relevance and impact, given the ambitious policy objectives and structural diversity of the new framework.

The new system will be *strategic*, *comprehensive*, *coherent* and *evidence-based*, providing a strong focus on the assessment of outputs and impacts. It will incorporate radical innovations in the way evidence is gathered and processed, notably more automated data collection mechanisms, an appropriate data archive, external expert advice, dedicated policy research activity, and increased cooperation with Member States and Associated States, and it will be *valorised* through appropriate dissemination and reporting activities.

6.2. Outline of key principles and possible indicators

The evaluation and monitoring system will need a clear strategic orientation in order to cover the wide range of activities in a consistent and coherent way. This orientation will be the subject of a dedicated Commission Communication. Key principles of the system will be:

- **Strategic**

  In preparation for launch of the new framework, a comprehensive evaluation and monitoring strategy will be developed and agreed by all actors involved. This strategy will ensure appropriate and systematic evaluation coverage of all Horizon 2020 action lines, and will define a detailed timetable for specific evaluation work. The strategy will be updated annually, taking into account new developments in the overall evaluation context.

- **Comprehensive**

  Three well-timed key deliverables are envisaged:

  - A comprehensive Interim Evaluation of Horizon 2020 and its specific programmes not later than 2017 (3 years into the programme), with a specific focus on the implementation so far, the quality of the research and innovation activities under way, progress towards the challenges and objectives set, and recommendations for possible improvements. This

evaluation will also provide valuable inputs to stimulate the debate on the future of EU funding programmes for research and innovation, and is expected to contribute substantially to any forthcoming Ex-Ante Impact Assessment.

- A full-scale Ex-Post Evaluation will be carried out in 2023 (2 years after the end of the programme), analysing, in depth, the rationale, the implementation and the impact of the activities. The findings of this evaluation should be taken up, where relevant, in the management of subsequent activities.
- Annual monitoring of all components under Horizon 2020.

Both the interim and ex post evaluations will be carried out with the assistance of independent external experts, using a broad evidence base. The findings of these evaluations will be rapidly taken into account in the implementation and management of Horizon 2020 or future programmes. They will also be communicated formally to the other institutions and to the stakeholder community at large, in order to provide the opportunity for a broad debate on the issues addressed.

- **Coherent**

The following components are envisaged to support and complement the overall Horizon 2020 evaluations:

- Each of the thematic or specific components of Horizon 2020 should be submitted to an Ex-Post Evaluation, supported by relevant studies and evidence gathering, within 2 years of its completion.
- Specific evaluation studies will be carried out by all services with management and policy responsibilities under Horizon 2020, according to the timetable and objectives defined by the evaluation and monitoring strategy (see above).
- Cross-cutting studies, will be set out in the evaluation and monitoring strategy, and should shed more light on issues of transversal interest such as the quality of research and innovation performance under Horizon 2020, job creation, growth and the impacts on key technologies or sectors. Also important will be studies on the wider context for research and innovation including the relative positioning of EU research and innovation activities, their global competitiveness and emerging trends.
- The evaluation and monitoring system will also be the basis for carrying out the Ex-Post Evaluation of FP7 in 2015 according to the legal requirements.
- Common templates, methodologies and indicators will be adopted, as far as possible, so as to promote comparability and coherence, and to facilitate an aggregated overview.
- Available data will be used to calculate a series of common key indicators. The system of indicators to be developed will link closely to the Horizon 2020 objectives. An indicative outline is given in the table below. Clear results targets will be set for each indicator - for example, X patent applications, or Y publications in high impact journals, per million € funding. (More details will be provided in the Legislative Financial Statement of the Horizon 2020 proposal.)

- **Evidence based**

At the centre of the Horizon 2020 evaluation and monitoring approach will be a powerful data gathering and processing capacity with the following features.

- **Focused on throughput, output and impact:** It will be essential to develop the tools for assessing progress towards objectives, project quality, output and impact of activities but in a way that does not over-burden programme participants. An integrated IT infrastructure and dedicated and automated data collection mechanisms (e.g. online forms and templates for periodic progress reports) will aim at significantly reduce this burden. Furthermore, the comprehensive ex-ante evaluation of all funding activities should be mirrored by a new system for an independent review of project quality. In addition, the information gathered during and at the end of projects, notably regarding publications and patenting, should be validated and complemented by information on other forms of outputs and deliverables to capture the potential impact of Horizon 2020 activities in a broad sense. This development work should examine the possible use of novel solutions such as unique researcher identifier.
- **Supported by an appropriate data archive**: Experience from recent Framework Programme evaluations has clearly demonstrated the paramount importance of a comprehensive system for collecting all kinds of timely and relevant data for the evaluation and monitoring process. For FP7, CORDA provides a wide range of relevant data, which are all retrieved from the application, negotiation and reporting processes without any additional burden on the applicant. The principles of this successful approach will be used for the development of a corresponding Horizon 2020 evaluation and monitoring data archive. The main challenges will be the need to systematically integrate, automate, and validate a much broader range of activities under one common IT architecture and the need to integrate additional information on outputs and outcomes (see above).
- **Supported by expert advice:** The internal efforts by the respective evaluation functions should be supported by a Reference Board of independent evaluation experts and users. This reference board should monitor the development and implementation of the Horizon 2020 evaluation strategy and monitoring, and provide expert advice and strategic guidance on the further development of the system.
- **Supported by a dedicated research activity:** A specific research effort in the field of Science of Research and Innovation Policy will be launched to develop innovative new evaluation methods and appropriate IT tools. The key objective of this initiative is to stimulate the development of novel methodologies for the evaluation of research and innovation activities, notably through the use of web based data and services. At the same time this activity should both deepen and widen the so far rather limited expert community in this area.
- **Supported by increased cooperation with Member States and Associated States:** While networking across the Commission services involved is essential to ensure an efficient and coherent evaluation and monitoring approach, it is equally important to step up the efforts to connect with actors at national and regional level. Not only will the research and innovation portfolio include a growing number of instruments for which evaluation activities at different levels should be envisaged, but there is also a growing need to put evaluation work at EU level and at national or regional level into mutual context. To this end a European Research and Innovation Evaluation Network will be created, evolving notably from the experiences gained over the last decade with the EU RTD evaluation network. This reorganisation should reflect the enlarged scope of the Horizon 2020 activities and provide the basis for a substantially increased cooperation with Member States and Associated States.

- **Valorised through appropriate dissemination and reporting**

Transparency of the evaluation process is a key element of an overall strategy for full accountability. Building on the positive experiences of recent years, the evaluation and monitoring system will in particular include the following elements:

- The aforementioned key indicators will be analyzed in Annual Horizon 2020 Monitoring Reports, which will present key data and indicators on the implementation of Horizon 2020. This report will essentially draw on the information available through the Horizon 2020 evaluation and monitoring data archive.
- Progress on the implementation of the evaluation and monitoring strategy will also be communicated in an Annual Horizon Evaluation Report, which will present the key findings from evaluation activities recently completed, the key features of the ongoing evaluation studies, and the planning for evaluation work in the near future..
- A dedicated Horizon 2020 Evaluation and Monitoring website will present all relevant material and should develop into an active tool to stimulate the exchange on evaluation activities for research and innovation programmes across Europe.

OBJECTIVE	*Indicator(s)*
Strengthen Europe's science base	*European Research Council:* - Share of publications from ERC funded projects which are among the top 1% highly cited - Number of institutional policy and national/regional policy measures inspired by ERC funding *Future and Emerging Technologies:* - Publications in peer-reviewed high impact journals - Patent applications in Future and Emerging Technologies *Marie Curie actions on skills, training and career development:* - Cross-sector and cross-country circulation of researchers, including PhD candidates *European research infrastructures:* - Research infrastructures which are made accessible to all researchers in Europe and beyond through EU support
Boost Europe's industrial leadership and competitiveness	*Leadership in enabling and industrial technologies:* - Patent applications obtained in the different enabling and industrial technologies *Access to risk finance:* - Total investments mobilised via debt financing and Venture Capital investments *Innovation in SMEs:* - Share of participating SMEs introducing innovations new to the company or the market (covering the period of the project plus three years)
Increase the contribution of research and innovation to the resolution of key societal challenges	- Publications in peer-reviewed high impact journals in the area of the different Societal Challenges - Patent applications in the area of the different Societal Challenges - Number of EU pieces of legislation referring to activities supported in the area of the different Societal Challenges
Provide customer-driven scientific and technical support to Union policies	- Number of occurrences of tangible specific impacts on European policies resulting from technical and scientific policy support provided by the Joint Research Centre - Number of peer reviewed publications
Help to better integrate the knowledge triangle	- Organisations from universities, business and research integrated in KICs - Collaboration inside the knowledge triangle leading to the development of innovative products and processes

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NOTES

[i] The graph is based upon GDP growth forecasts made by HSBC (The World in 2050 – Quantifying the Shift in the Global Economy, HSBC, 4 January 2011), and uses data from OECD and the World Bank. The "G7" is the group of seven industrialized nations: Canada, France, Germany, Italy, Japan, UK and the US; "E7" is a group of rapidly emerging economies: Brazil, China, India, Indonesia, Mexico, Russia and Turkey. The 3 scenarios are as follows (1) In the "current trend" scenario, the projections are based on the trend observed during the period 1996-2007. The maximum R&D intensity for each country is limited at 5%. (2) The "convergence" scenario assumes that R&D expenditures for all countries will continue along the current trend, but for E7 countries once an R&D intensity of 3% is reached the annual R&D intensity growth for that country is limited to 1%. (3) The "Recovery" scenario assumes that G7 countries will - by 2020 - spend at least 3% of GDP into research and will continue to increase their investments. After 2020, it is assumed that the annual growth rate of R&D intensity in G7 will be the average annual growth rate during the period 1990-2020.

[ii] The graph is based on the assumption that R&D spending in the E7 and the G7 will evolve in line with the "convergence scenario" in the left figure in Box 6. It assumes a gradually increasing propensity to patent (patent/business R&D ratio) for the E7 countries, and a stable propensity for the G7. Data are for patent applications filed under the PCT, at international phase, designating the European Patent Office (the PCT is a system facilitating the worldwide filing of patent applications).

[iii] (1) For each technology field the graph shows on the X axis the global market share of Europe in terms of EPO/PCT patents compared with the market share of Asia (expressed as a logarithm), and the Y axis shows the market share of Europe compared with the market share of North America (expressed as a logarithm). (2) The broad technology domains are shown in bold.

[iv] Data for broad technology domains taken from a study by Research Division INCENTIM, MSI, Faculty of Business & Economics, KULeuven, Università Commerciale Luigi Bocconi, KITES); Data for enabling technologies taken from "European Competitiveness in Key Enabling Technologies" by Birgit Aschhoff, Dirk Crass, Katrin Cremers, Christoph Grimpe, Christian Rammer (ZEW, Mannheim), Felix Brandes, Fernando Diaz-Lopez, Rosalinde Klein Woolthuis, Michael Mayer, Carlos Montalvo (TNO, Delft), May 28th, 2010 (Study commissioned for European Commission DG Enterprise); All other data from OECD Patent Database.

[v] National funding is calculated as the annual average over the period 1999-2005. For the European countries, public funding includes both national funds and EU Framework Programme funding. Data are taken from the following sources: Peter Bjørn Larsen, Els Van de Velde; Eveline Durinck, Henrik Noes Piester, Leif Jakobsen and Hanne Shapiro (2011), "Cross-sectoral Analysis of the Impact of International industrial Policy on Key Enabling Technologies", published by European Commission, DG Enterprise and Industry; M.C. Roco, C.A. Mirkin, and M.C. Hersam (eds.) (2010), "Nanotechnology Research Directions for Societal Needs in 2020 - Retrospective and Outlook", NSF, WTEC report, Springer, Berlin and Boston ; OECD (2008, 2009), "Inventory of National Science, Technology and Innovation Policies for Nanotechnology", OECD, Paris.

[vi] The concept of critical mass is of key importance for EU research and innovation programmes. Critical mass can be looked at from both a programme and a project perspective: Achieving critical mass at the programme level means being able to fund a sufficiently broad portfolio of relevant technologies (at this point in time, it is not necessarily clear what technologies are the most promising ones for addressing each one of the societal challenges) and, for each technology, a sufficiently large body of complementary R&D&I projects that can build on each other. Achieving critical mass at the project level means being able to fund projects large enough to bring together across countries, sectors and disciplines, all partners and complementary knowledge resources required to achieve certain technological objectives. For instance, a dedicated study on advantages of scale and scope at the research project level has revealed that there is an inverse U-shaped relation between project scale and project output and that the maximum of this inverse U-shaped relation depends on the objective pursued. For some objectives, one needs higher numbers of partners and for some objectives, one needs smaller numbers of partners. The results of this study are being taken account of in the design of Horizon 2020 with, for instance, less emphasis on artificially large consortia.

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COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

Annexes

Annex 0: List of Boxes Presenting Complementary Information on Concepts and Evidence Used in the Report

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ANNEXES

ANNEX 0: LIST OF BOXES PRESENTING COMPLEMENTARY INFORMATION ON CONCEPTS AND EVIDENCE USED IN THE REPORT

Box 1: European research and innovation programmes support scientific excellence

Excellence has been one of the main principles underlying EU research support, and one of the keys to its success has been its ability to attract top scientists, top institutions, and first-rate projects.

Attracting top scientists: European Union research programmes have always attracted top level researchers. FP funded scientists tend to have a better publication and citation performance than their non-FP peers (e.g. see European Policy Evaluation Consortium, 2009). The FP also helps to attract leading researchers who might otherwise have pursued their careers in the US. For example, two-thirds of the ERC's grant-holders in neurosciences have had post-doctoral experience in the US. Moreover, between 2008 and 2011, six of the 17 Europeans who were awarded prestigious research prizes were ERC grantees.

Attracting leading institutions: EU research and innovation programmes have also attracted the very best research institutions. The interim evaluation of FP7 concluded that ""the list of organisations that have obtained the largest amounts of funding from FP7 can be read as a Who's Who of European research quality".

- Leading universities: About half of top university participants in FP6 rank among the world's best 100 universities, and 94 percent rank among the world's best 400 universities (Academic Ranking of World Universities 2010).
- Top industrial performers: Compared to the average company in their sector, FP industrial participants are more R&D-intensive, more innovative, better networked and more focused on international markets, and patent more (Polt et al., 2008). 31 out of 34 European companies in the Top 100 R&D investing companies received funding under FP6.
- Excellent public research centres: The FP provides support to Europe's leading public research centres such as the Max Planck Gesellschaft, the Fraunhofer Gesellschaft, the CNRS and the Commissariat à l'Energie Atomique which occupy key positions in FP projects and networks.

Financing first-rate projects: FP proposals are peer-reviewed and scored according to three criteria: scientific excellence, project management quality, and potential impact. The mean score for 'scientific quality' was 4.4 out of 5 (minimum 4) and the mean sum for the three criteria was 13.1 out of 15. As a result, EU research is recognized as leading in a number of fields. For example this is the case in several environmental research areas (EPEC, 2008), where, according to peer reviewers, the impact of EU research is particularly high for projects in three areas: climate change, water and soils, and natural hazards. Not surprisingly, EU funded projects are also visible and influential in the top scientific literature. In 2010, at least one ERC funded project reported its findings in either Nature or Science every two weeks.

See Annex 1 for more detail on how EU research and innovation programmes support excellence

Box 2: EU research and innovation programmes produce value for money

The impact of public R&D is significant and widely documented (Annex 2). For example:

- Studies have shown that the rate of return for publicly funded R&D usually exceeds 30 percent, and that each extra 1 percent in public R&D generates an extra 0.17 percent in productivity growth.
- Estimates of the impact of UK Research Council spending suggest that a cut of £1 billion in annual spending would lead to a fall in GDP of £10 billion.
- Spending by the US National Institute of Health supported nearly 488,000 jobs and produced US$68 billion in new economic activity in 2010.

EU research programmes produce excellent value for money for the European taxpayer not only because they generate the significant impacts of public R&D outlined above, but also because EU projects are selected to have a higher impact than national public R&D support (see Box 9). Specific studies have examined the effects of EU funding and have demonstrated the following economic impacts:

- €1 of Framework Programme funding leads to an increase in industry added value of around €13.
- Member States' own evaluations demonstrate the high impact of the FP: the FP's annual contribution to, for instance, UK industrial output exceeds £3 billion.
- On the basis of econometric modelling, the long-term impact of FP7 has been estimated at an extra 0.96 percent of GDP, an extra 1.57 percent of exports, and a reduction of 0.88 percent in imports.
- The long-term employment impact of FP7 was estimated at 900,000 jobs, of which 300,000 in the field of research.
- The potential value added generated by eco-innovation pilot and market replication projects under CIP could be calculated in some € 3.4 million per million € invested (DG ENV, ref. Varma, 2007).

In addition, to these excellent economic returns, EU research actions have also generated major social and environmental impacts (Box 20 and 21).

See Annex 1 sections 2.10, 2.11, 2.12 for more details of how EU research actions offer value for money

Box 3: Assessing the leverage effects of EU research and innovation programmes

EU research and innovation programmes leverage private funding, as demonstrated by a wealth of evidence:

- An extensive body of academic economics literature has demonstrated that public subsidies for R&D produce crowding-effects, i.e. have a positive net effect on the total availability of R&D funding, and that these crowding-in effects are larger for collaborative research (Annex 2).
- An econometric analysis of Community Innovation Survey micro-data carried out by JRC in collaboration with DG Research & Innovation has concluded that FP support has a crowding-in effect on the level of companies' R&D investments (Box 18).
- These findings are confirmed by a wide range of ex-post evaluations:
  - The Clean Sky Joint Technology Initiative mobilises about €800 million in private in-kind contributions to achieve the single largest aeronautics research venture in Europe so far.
  - The multiplier effect of the FP7 Risk-Sharing Finance Facility, an innovative debt financing instrument jointly set up by the Commission and the European Investment bank that provides loans and guarantees for private companies or public institutions with a higher financial risk profile for their research, technological development and innovation activities (RDI), is expected to be 12 between the EU contribution and the volume of loans, and over 30 between the EU contribution and the additional leveraged investment in RDI.
  - CIP financial instruments supporting innovation in collaboration with the European Investment Fund (EIF) have acted as a cornerstone investor in 17 venture capital funds leveraging €1.3 billion of total investment in growth-oriented SMEs. The leverage effect of the GIF, which concerns equity investments, is 6 to 1.
  - The space innovation project KIS4SAT (start-ups, business support schemes, vouchers for innovation activities) leveraged €10-20 million via involvement in supporting fund raising activities.
  - A recent external evaluation of EIT suggests that the overall leverage effect of its KIC funding will be between 4 and 5 to 1 (€1 of EIT funding produces €4-5 of additional funding) by the end of 2013.The EIT provides on average up to 25% of KIC budgets, which leverages 75% of supplementary investment emanating from a range of public and private sources.
  - 60% of all surveyed FP7 health research participants stated that EU funding helped access other research funding. 15% of the SMEs that leveraged additional research funds did so from business angels or venture capitalists.

EU research and innovation programmes also leverage public funding:

- For ERA-NETs, the leverage effect of FP funding is close to 5, while for ERA-NET Plus, it is 2.5. More than 15 of the initial FP6 ERA-NETs achieved leverage effects of 10 and more: €1 of FP funding resulted in €10 of coordinated research funding.
- A survey among FP6-IST programme participants (WING, 2009) showed that about two thirds (~65%) of industry participants increased their ability to get further R&D funding not only in-house but also (and especially for SMEs) from other EU or national sources.
- FP participation in Socio-Economic Sciences and Humanities (SSH) facilitated access to additional funding in 68% of the projects.
- Marie Curie actions leverage additional regional, national and international funds through the co-funding mechanism of individual fellowships such as COFUND. The total budget of the 81 COFUND programmes selected amounts to €528 million, of which only €211 million is contributed by the EU.
- The Euratom SARNET-2 Network of Excellence defines joint research programmes and develops common computer tools and methodologies for safety assessment of nuclear power plants. With an EU contribution of just €5.75 million out of a total budget of €38 million it generates for each €1 FP funding more than €6 additional research funding.

See Annex 1 for additional evidence on leverage effects

Box 4: Assessing the impact of the direct research actions of the Joint Research Centre

As the Commission's Directorate-General responsible for direct research, the JRC is known for its support to EU policies and its contributions to sustainable development, competitiveness and the security and safety of nuclear energy. It makes science more visible in the work of the Commission in support of more evidence-based policy processes.

To underpin proposals for its 2014-2020 programme the JRC prepared an impact report with a steering group of external experts, presenting new facts about the outcomes and impacts of the direct research actions of the JRC with:

- an analysis of the policy impact of JRC activities in 2010
- case studies of specific impact for long-term JRC support
- an estimate of JRC's economic impact
- expectations for future impact

The analysis of JRC internal output and impact data for the year 2010 shows that around 85% of the JRC actions achieved a verifiable tangible "policy impact". Roughly 75% of these impacts occur in the Commission and relate to EU policies.

The case studies in the report show JRC actions in selected examples achieving cost-benefit ratios from 1:40 up to as high as 1:250 (cf. annex 1 success stories).

The economic impact of the JRC is placed into the perspective of a recent study commissioned by the European Association of Research and Technology Organisations (EARTO), reporting that 275 RTOs in Europe with a combined annual turnover of around EUR 20 billion generate an estimated economic impact of the order of EUR 100 billion.

Cost-benefit ratios for the JRC are favourable and its return on investment is sizeable and significant. Nevertheless, the external experts place strong emphasise on the huge importance of the JRC's impact on intangible EU assets, such as enhanced human capital, knowledge creation and sharing, competitiveness from setting European standards, better policy decision making.

Regarding future impact of the JRC, the baseline is a scenario with permanent institutional support to EU policies leading to continued significant impact and return on investment in policy areas where science plays a sensitive role, i.e. in areas involving people's health, people's safety, the environment as well as the competitiveness of the European economy.

On top of this baseline, new activities will address priority areas in the Commission's flagship initiatives and generate relevant impacts for the achievement of the Europe 2020 strategy.

Developments giving rise to new environmental, economic and political situations beyond the Europe 2020 strategy cannot be predicted, but the experience is that the JRC is able to respond quickly and effectively to sudden events and crises. In these situations the JRC is likely to generate further impact through flexibility and quick response.

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Annexes

Annex 1: Past Achievements and Lessons Learned - Part A

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ANNEX 1: PAST ACHIEVEMENTS AND LESSONS LEARNED

This annex aims to provide an overview of the outputs, effects and impacts achieved by the Framework Programmes for Research and Technological Demonstration (FP), the Competitiveness and Innovation Programme (CIP), and the European Institute of Technology and Innovation (EIT). As required by the Commission's impact assessment guidelines, past FP achievements were discussed at length in the April 2005 ex-ante impact assessment accompanying the proposal on FP7. In order to avoid duplication, this annex focuses as far the FP is concerned in the first place on evidence produced since that date. For this reason, the evidence presented below pertains in particular to FP6 and FP7.

SUMMARY ON PAST ACHIEVEMENTS AND LESSONS LEARNED

The different programmes integrated into the Common Strategic Framework for Research and Innovation – the FP, the CIP and EIT - have achieved large impacts in the course of their history.

FP achievements

The FP has involved large numbers of top ("A-team") EU and extra-EU researchers in thousands of first-rate, mixed (firms, universities, research institutes), cross-border projects – projects that in the absence of EU funding would not have been carried out, postponed, or scaled down in financial terms, in terms of scope and ambition, or in terms of the number of partners involved - to carry out excellent, often inter-disciplinary, collaborative research on a very wide range of topics.

The FP has facilitated the training and pan-European/extra-European mobility of researchers, enhanced the quality of doctoral training (including through industrial doctorates), added to the research capabilities of participating institutions, and formalised and oriented the R&D and innovation processes of in particular small organisations (e.g. SMEs), young organisations (e.g. start-ups), and organisations from recent Member States and candidate countries.

The FP has produced new knowledge embodied in large numbers of influential (because highly-cited) (co-) publications and enhanced the development of new products and processes; the development and use of new tools and techniques; the design and testing of models and simulations; the production of prototypes, demonstrators, and pilots; and other forms of technological development.

The FP has generated large numbers of patents and enabled participants to increase their turnover and profitability, raise their productivity, increase their market share, obtain access to new markets, reorient their commercial strategy, improve their competitive position, enhance their reputation and image, and reduce commercial risk. In addition, the results of FP direct and indirect actions have supported EU-level policy formulation.

The FPs' positive impacts on innovation have translated, down the line, into large-scale positive macro-economic, social and environmental impacts.

The FP has produced so-called "structuring effects": durable changes in the EU research and innovation landscape. If it were not for the FP, the European Research Council, promoting excellence across Europe, would not have been created; the EU would then have been left with a landscape of compartmentalized national research councils, but would have had no funding mechanism to promote EU-wide competition for funds and to encourage higher scientific quality in frontier research. Thanks to the Marie Curie Actions, the EU has created the right framework for researchers' careers and free movement of knowledge. The EU leads in the creation and use of research infrastructures of pan-European importance: thanks to EU leadership, for the first time, a pan-European strategy on research infrastructures (the so-called ESFRI roadmap) has been developed and is now being implemented. Collaborative research projects, international cooperation actions, mobility actions, and research infrastructure actions have generated durable, cross-sectoral, inter-disciplinary research and innovation networks across Europe as well as with the world's most dynamic and fastest growing research nations that have remained alive after the end of EU funding. European Technology Platforms and ERA-NETs have served as useful focusing devices that have helped stakeholders identify and explain their R&D needs jointly, easing the process of developing mutually supportive policies at EU and Member State levels. Joint Technology Initiatives have focused and aligned key actors in their respective areas, serving as a support to develop coherent sectorial strategies. Article 185 and Joint Programming initiatives have achieved a better coordination of R&D in Europe and supported a more coherent use of resources.

CIP achievements

According to a recent 'Final Evaluation' of the EIP component of the CIP, the programme is performing well and on track to achieve the levels of activity anticipated in the CIP Decision and ex-ante impact assessment. Surveys carried out under the evaluation have demonstrated the utility of the programme (it directly meets identified needs) and its European added value. The evaluation found that existing financial instruments are supporting a substantial number of SMEs and administered efficiently, and that most innovation-related actions are seen as well-focused and appropriate. The Final Evaluation issued several recommendations, mostly aimed at expanding the existing activities launched within the current EIP and making them more comprehensive and consistent. The eco-innovation funding scheme for first application and market replication projects within the EIP helped a number of enterprises to bring their innovative goods to the market.

The ICT Policy Support Programme component of CIP has been able to bring Member States together to test deployment of innovative ICT applications at real scale in several important policy areas. These actions aimed at stimulating demand and facilitating formation of markets in areas with high untapped potential such as cross-border e-health services. They also helped to reduce fragmentation of markets for innovative ICT products and services, slow consensus and standardisation processes, lack of interoperability, diverging legislation and national practices. However, it is still too early to identify whether this potential is being realised as most pilots were launched in 2008 or later, and most are still grappling with mid-term implementation. The ICT-PSP is complimentary to the initiatives of FP7, especially in supporting interoperability and attracting a broader constituency (i.e. public authorities) to facilitate the uptake of technologies (Eureval, 2009; Pogorel et al., 2009).

EIT achievements

The main achievements of the EIT since the establishment of the EIT headquarters in April 2010 have been primarily in setting up its own structure and the development of each Knowledge and Innovation Community (KIC) as a single legal entity led by a Chief Executive Officer. The EIT also set up the EIT Foundation in September 2010 in the Netherlands as a new, flexible financing tool to leverage philanthropic funds in support of educational and entrepreneurial activities bringing the EIT and its KICs closer to European society.

While European research and innovation programmes have been successful, there are important lessons to be learned from the past, from stakeholder feedback, and from analytical studies. Research, innovation and education should be addressed in a more coordinated manner and in coherence with other policies and research results better disseminated and valorised into new products, processes and services. The intervention logic of EU support programmes should be developed in a more focused, concrete, detailed and transparent manner. Programme access should be improved and start-up, SME, industrial, EU12 and extra-EU participation increased. Monitoring and evaluation need to be strengthened (for details see section 3).

DETAILED EVIDENCE ON PAST ACHIEVEMENTS

THE FP ACHIEVES A VAST REACH

Through thousands of contracts, the FP reaches tens of thousands of participants from a variety of sectors, from a large number of EU and non-EU countries, and from a wide range of disciplines.

The case of collaborative research is illustrative. Collaborative research constitutes the largest component of the Framework Programme. It accounted for 70% of the budget under FP6 and accounts for 64% of the budget under FP7. A statistical analysis performed on shared-cost action participation data[1] across FPs shows that the FP funds large numbers of projects bringing together different types of participants from all Member States as well as from other countries.

- **The FP funds thousands of research projects and participations with critical mass:** From FP2 to FP5, the growth in the collaborative research budget was accompanied by increases in the number of collaborative research projects (from 2779 in FP2 to 6712 in FP5) and participations (from 13 000 to 44 000). As from FP6, more emphasis was put on achieving a 'critical mass' of resources within a project: fewer projects were funded but they became of a greater size than before. The average number of

participations per project doubled (from 6.5 to 13) and the average Commission funding per project increased by 278%, from €1.4 million to €3.9 million. The average EU funding per participation also increased from € 196 000 to € 283 000. FP7 appears to maintain this trend towards larger projects with higher funding per project and per participation (Table1).

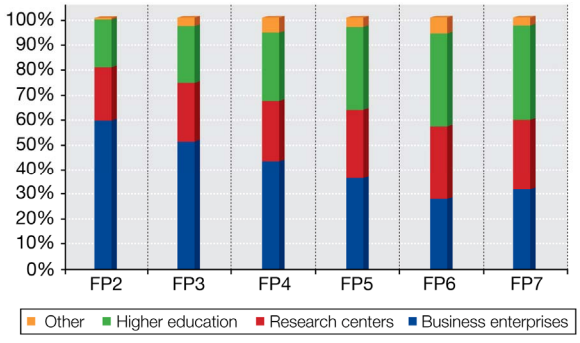
Table 1: The changing features of FP shared-cost research actions

Indicators	**FP2-EU-12** 1987-1991	**FP3-EU-15** 1990-1994	**FP4-EU-15** 1994-1998	**FP5-EU-15** 1998-2002	**FP6-EU-25** 2002-2006	**FP7-EU-27** 2007-2013
	Definitive data	Definitive data	Definitive data	Definitive data	Definitive data	Partial data
No. of projects	2779	3292	2949	6709	3110	2455
No. of participations (000)	13	18	21	41	40	25
Average no. of participations per project	4,7	5,6	7	6,2	13	10
Average no. of different Member States per project	3	3,5	4,2	3,7	6	6
Average EU funding per project (€000)	1202	1218	1160	1405	3928	4069
Average EU funding per participation (€000)	256	218	165	200	283	378

Source: DG Research & Innovation

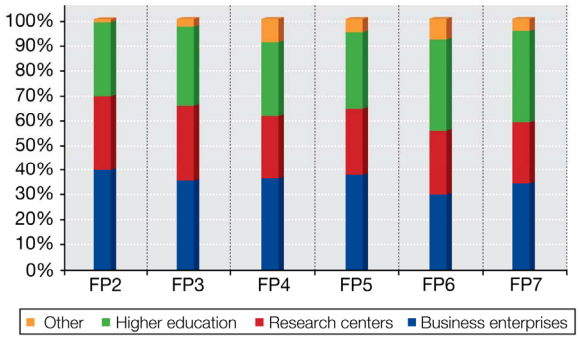
- **FP research funding and participations are allocated in a balanced manner to different types of research actors:** Available shared-cost action data show an increasingly balanced allocation of funding and participations to the different types of research actors: business enterprises, research centres, and higher education institutions. Business enterprises initially accounted for the largest share of funding and participations. Research centres and higher education institutions gradually increased their shares over time. FP7 appears to have stopped and even reversed, in terms of both, funding and participations, the decline in business enterprise participation (Figures 1&2).

Figure 1: How is FP funding shared between the main research actors? (% of FP funding received by type of participant)



*Note: * Partial FP7 data (to 01.2011); Source: DG Research & Innovation*

Figure 2: How is FP participation shared between the main research actors? (% of FP participations by type of participant)



*Note: * Partial FP7 data (to 01.2011); Source: DG Research & Innovation*

- **FP collaborative research actions involve a significant number of SMEs**

SMEs accounted for 19.1% of FP7 shared cost action participations so far and 15.8% of FP7 shared cost funding disbursed so far (only MS). Among 'Private for profit' participants (mainly business enterprises), SMEs accounted for 49.5% of participations and 45.1% of funding. For shared cost actions, the 15 percent SME participation target appears to be achieved.

The FP succeeds in attracting and supporting highly performing SMEs. 34 of the 500 fastest growing enterprises in Europe in the year 2010 had participated in the FP, almost all of them several times.

Table 2. FP6 and FP7 participations and funding by country

Countries		FP6				FP7*			
		Participations		FP funding		Participations		FP funding	
		No	%	mln €	%	No	%	mln €	%
Member States	DE - Germany	7.089	15,80%	2.338	19,17%	5.041	15,09%	1.954	18,1%
	UK - United Kingdom	5.146	11,47%	1.583	12,98%	3.600	10,78%	1.322	12,3%
	FR - France	5.007	11,16%	1.572	12,89%	3.378	10.1%	1.324	12,3%
	IT - Italy	4.344	9,68%	1.139	9,35%	3.243	9,71%	976	9,1%
	ES - Spain	2.915	6,50%	716	5,88%	2.218	6,60%	686	6,4%
	NL - Netherlands	2.562	5,71%	827	6,79%	1.953	5,85%	711	6,6%
	SE - Sweden	1.692	3,77%	533	4,37%	1.226	3,67%	432	4,0%
	BE - Belgium	1.645	3,67%	470	3,85%	1.516	4,54%	465	4,3%
	EL - Greece	1.434	3,20%	322	2,64%	1.013	3.00%	299	2,8%
	AT - Austria	1.208	2,69%	323	2,65%	900	2,69%	297	2,8%
	DK - Denmark	1.096	2,44%	303	2,49%	682	2,04%	253	2,4%
	PL - Poland	944	2,10%	141	1,16%	569	1,70%	114	1,1%
	FI - Finland	902	2,01%	264	2,16%	792	2,40%	284	2,6%
	PT - Portugal	683	1,52%	125	1,03%	532	1,59%	125	1,2%
	HU - Hungary	594	1,32%	99	0,81%	377	1,13%	65	0,6%
	CZ - Czech Republic	582	1,30%	91	0,75%	376	1,13%	67	0,6%
	IE - Ireland	447	1,00%	119	0,98%	398	1,19%	130	1,2%
	SI - Slovenia	310	0,69%	54	0,45%	249	0,75%	47	0,4%
	RO - Romania	237	0,53%	28	0,23%	286	0,86%	42	0,4%
	BG - Bulgaria	187	0,42%	23	0,19%	166	0,50%	20	0,2%
	SK - Slovakia	155	0,35%	21	0,17%	120	0,36%	20	0,2%
	EE - Estonia	146	0,33%	21	0,17%	120	0,36%	20	0,2%
	LT - Lithuania	131	0,29%	15	0,13%	101	0,30%	13	0,1%
	CY - Cyprus	102	0,23%	15	0,12%	92	0,28%	17	0,2%
	LV - Latvia	89	0,20%	12	0,10%	62	0,19%	7	0,1%
	LU - Luxembourg	73	0,16%	16	0,13%	55	0,16%	11	0,1%
	MT - Malta	37	0,08%	5	0,04%	44	0,13%	5	0,0%
	JRC	148	0,33%	29	0,24%	119	0,36%	33	0,3%
	Total Member States	39.757	88,59%	11.176	91,67%	29.109	87,13%	9.740	90,5%
Candidate Countries	HR - Croatia	63	0,14%	8	0,07%	78	0,23%	13	0,1%
	IS - Iceland	64	0,14%	18	0,15%	48	0,14%	11	0,1%
	MK - FYROM	33	0,07%	3	0,02%	29	0,09%	3	0,0%
	TR - Turkey	194	0,43%	31	0,25%	185	0,55%	30	0,3%
	Total Candidate Countries	354	0,79%	60	0,49%	340	1,02%	58	0,5%
Associated countries	CH - Switzerland	1.380	3,07%	336	2,76%	1.156	3,46%	420	3,9%
	IL - Israel	493	1,10%	147	1,20%	388	1,16%	142	1,3%
	NO - Norway	770	1,72%	211	1,73%	516	1,54%	180	1,7%
	Total Associated Countries	2.648	5,90%	695	5,70%	2.161	6,47%	755	7,0%
Third Countries	US - United States	113	0,25%	11	0,09%	166	0,50%	20	0,2%
	AU - Australia	58	0,13%	3	0,02%	69	0,21%	2	0,0%
	CA - Canada	66	0,15%	2	0,01%	68	0,20%	2	0,0%
	JP - Japan	16	0,04%	1	0,00%	26	0,08%	2	0,0%
	CN - China	224	0,50%	28	0,23%	153	0,46%	17	0,2%
	IN - India	66	0,15%	9	0,08%	125	0,37%	20	0,2%
	BR - Brazil	92	0,20%	12	0,09%	82	0,25%	12	0,1%
	RU - Russian Federation	263	0,59%	39	0,32%	203	0,61%	30	0,3%
	Rest of the world	1.186	2,64%	153	1,25%	908	2,72%	110	1,0%
	Total	**44.880**		**12.192**		**33.410**		**10.768**	

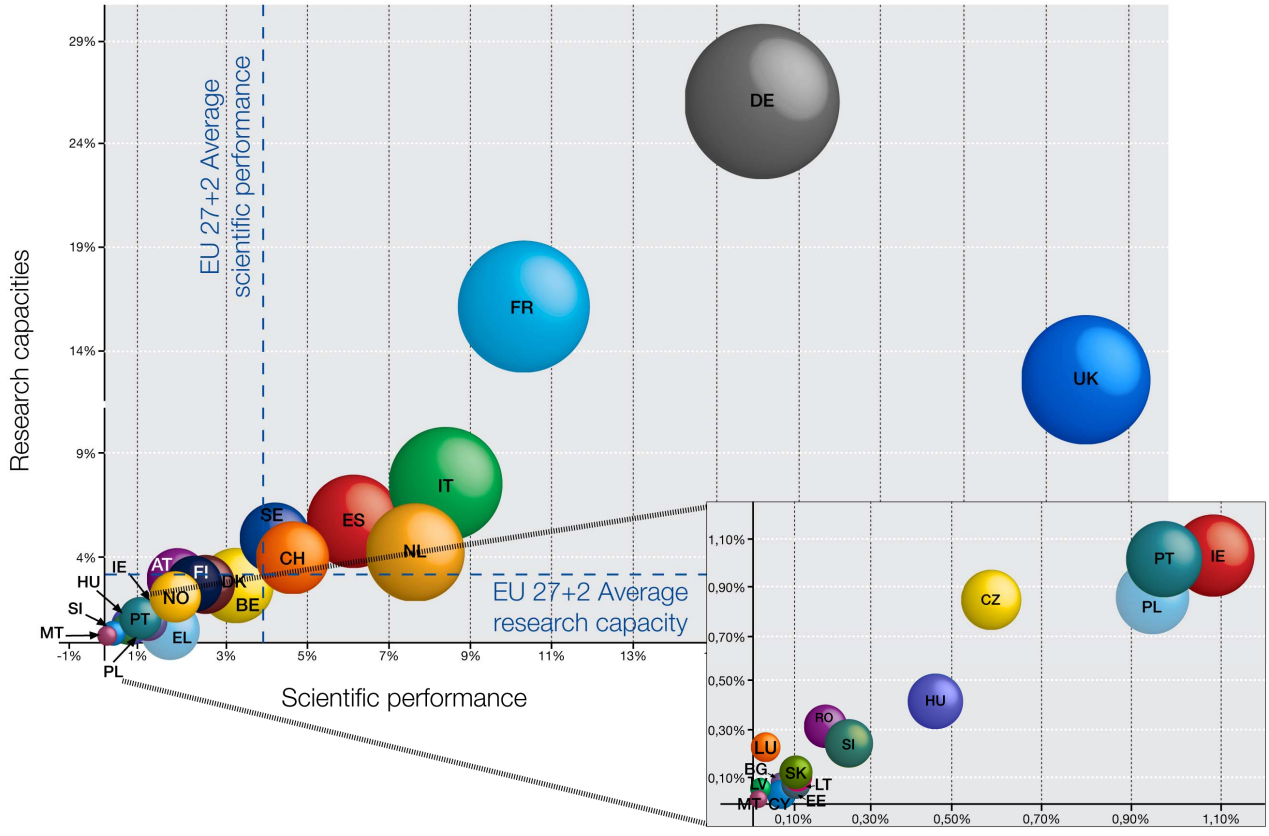
*Note: * Partial FP7 data (to 01.2011); Source: DG Research & Innovation*

- **The FP brings together participants from a large number of countries: EU Member States, associated countries and third countries: No less than 243 countries participated in FP6 including** 27 EU Member States, 5 Associated Countries, 3 Candidate Countries and 108 third countries from all continents. After the Member States and Associated Countries, the so-called BRIC countries (Brazil, Russia, India, China) accounted for most FP participations and funding (Table 2).
- **The FP brings together participants from a large number of regions:** FP6 funding reached 256 of the 271 EU27 Member State regions (NUTS 2 level), from Crete and Cyprus in the South to Lapland (FI) in the North and from Algarve (PT) to the Black Sea (RO).
- **The extent of involvement in the FP of individual EU Member States, associated countries, and EU regions is in line with their economic and research capabilities.**

  FP collaborative research funding is awarded on the basis of scientific excellence, not nationality, large economies with large research capabilities like Germany, France, the United Kingdom and Italy therefore account for the highest share of both FP funding and participations (Table 2, Figure 3). The opposite is true for smaller and new Member States, which do not have the research capabilities to absorb large amounts of FP funding. The statistical analysis shows that there is a very strong correlation (0,98) between the magnitude of FP funding received by a Member State and the size of its economy: the share of FP funding received by a country is in 96% related to its share of the EU GDP.

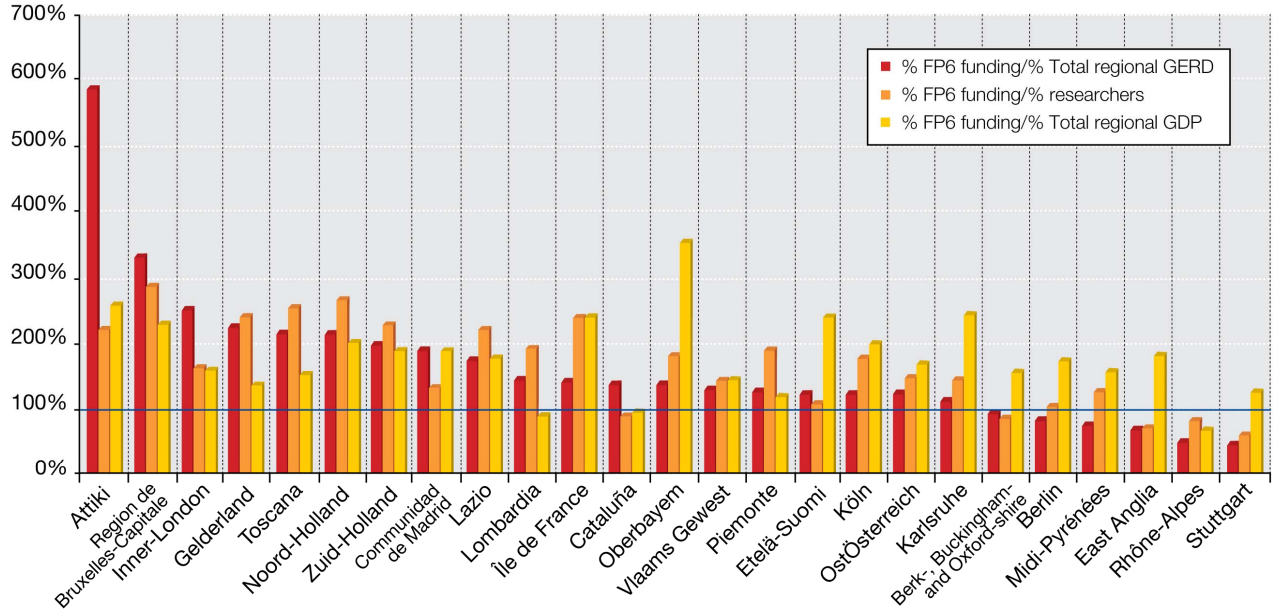
  The same pattern is replicated at regional level: FP participations and funding are concentrated in regions where research activities are concentrated. The top regional recipients of FP funding are the well-known European centres of scientific excellence and innovation performance, including Northern Italy, Bavaria, Oxfordshire, Rhone-Alps and capital regions, like London, Madrid and Ile-de France (Figure 4).

Figure 3: Involvement in FP7 is aligned with country's scientific performance and research capabilities



Source: *DG Research & Innovation,*
Data: *Eurostat,, Science Metrix / Scopus (Elsevier)*
Note: *Research capacities=share of EU27+NO+ CH GERD*
Scientific performance= share ofEU27+NO+CH highly cited publications
Size of bubble is proportional to FP7 funding received

Figure 4. Top 25 regional recipients of FP6 funding

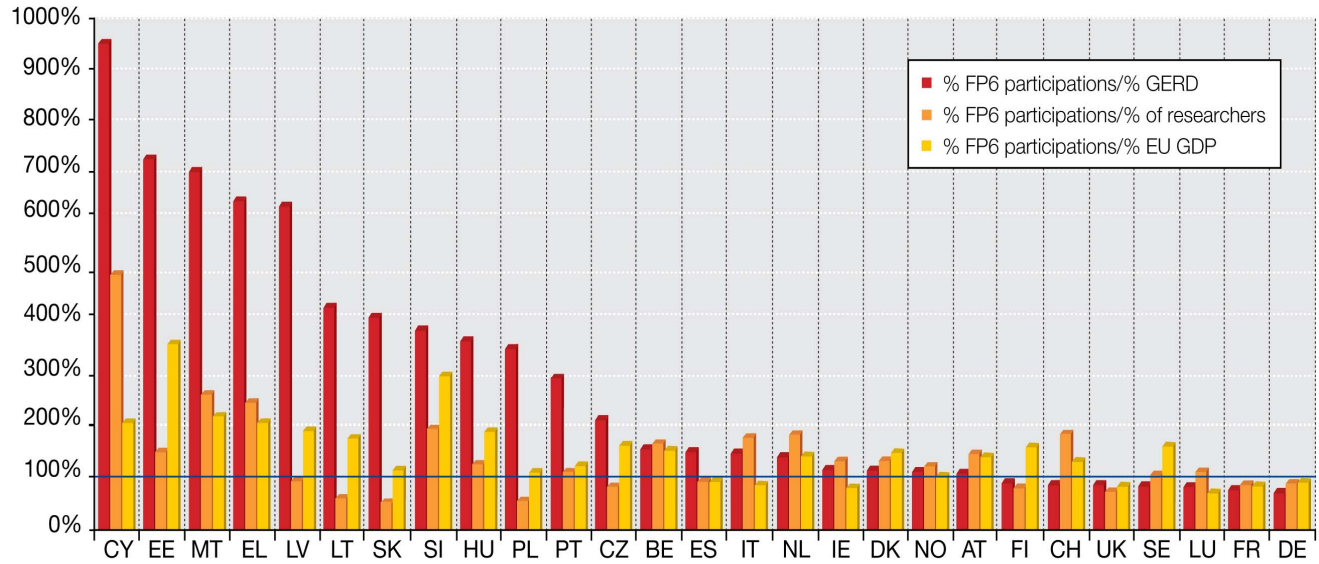


Source: DG Research & Innovation, Data for EU 27

- **Small and new EU Member States and their regions participate more intensely and benefit more from the FP than their research and economic capabilities and scientific and technological performance would suggest**

  When ranking Member States in terms of their share of FP participations or funding divided by their share of EU GDP, European researchers or GERD, smaller Member States tend to receive more funding and account for more participations than their economic performance and research capabilities could suggest. (Figures 5, 6, 7 & 8).

Figure 5: New Member States participate more intensively in the FP6



Source: DG Research & Innovation, Data for EU 27+NO+CH

[1] The statistical analysis was performed on the Framework Programmes participation data extracted from the central FP contract management database, CORDA. The shared-cost, collaborative-research actions filter was applied, what implies that i.e. in FP6 only Integrated projects, STREPs and Networks of Excellence data were considered. The scope of data varies from one FP to another, as the FP instruments and rules for participation evolved and the labels attached in the databases to FP participants also changed. This makes the data difficult to analyse and the comparison required certain regrouping of data. Moreover, the incomplete data on participants' SME status is a major drawback of FP databases. This situation improved for FP7 reporting.

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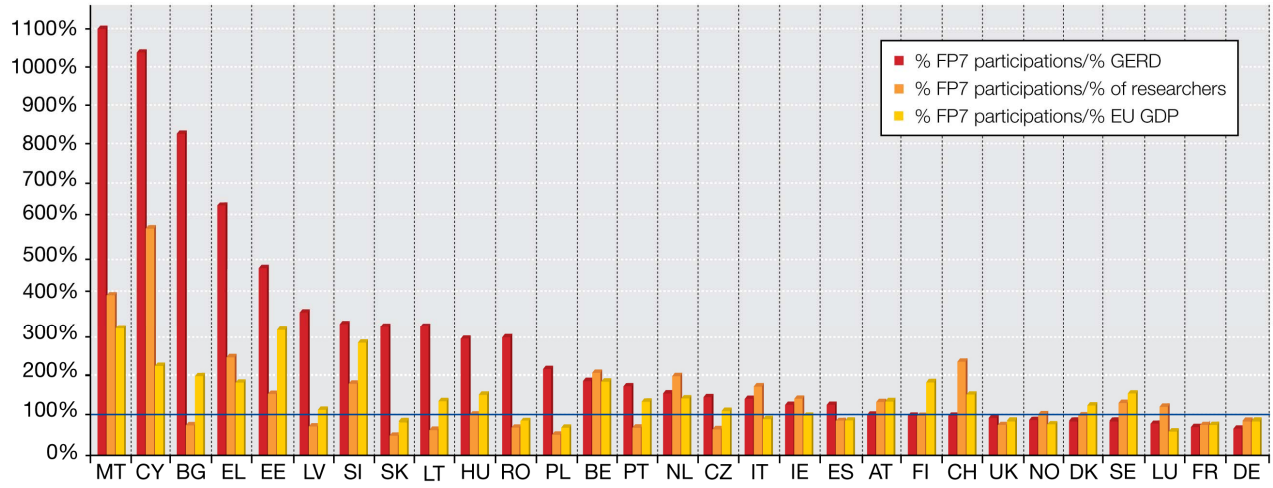
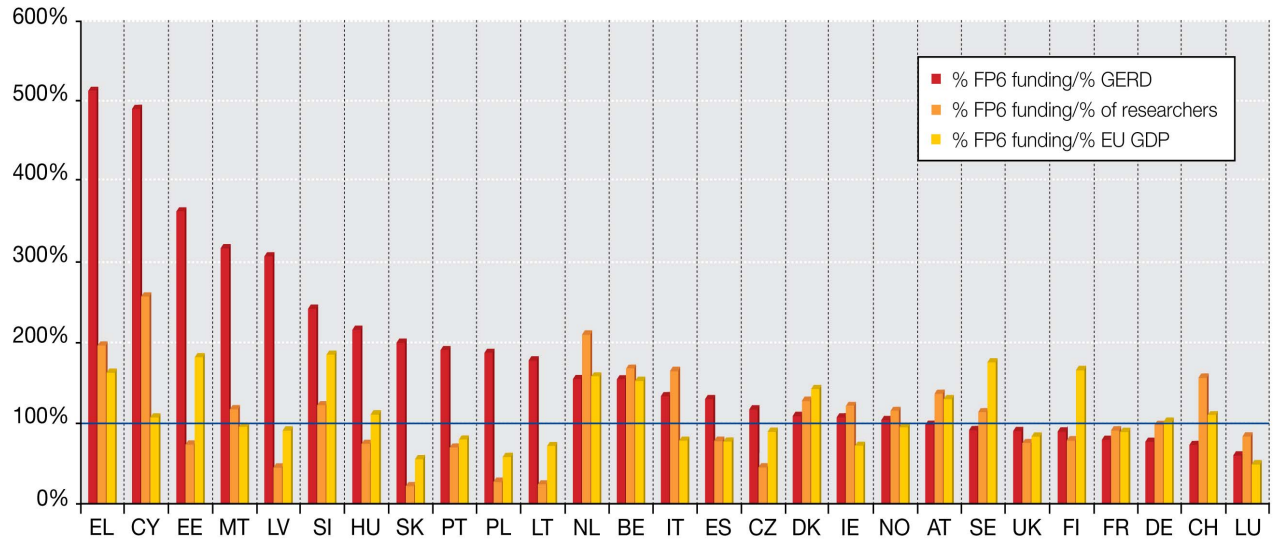
Figure 6: New Member States participate more intensively in the FP7



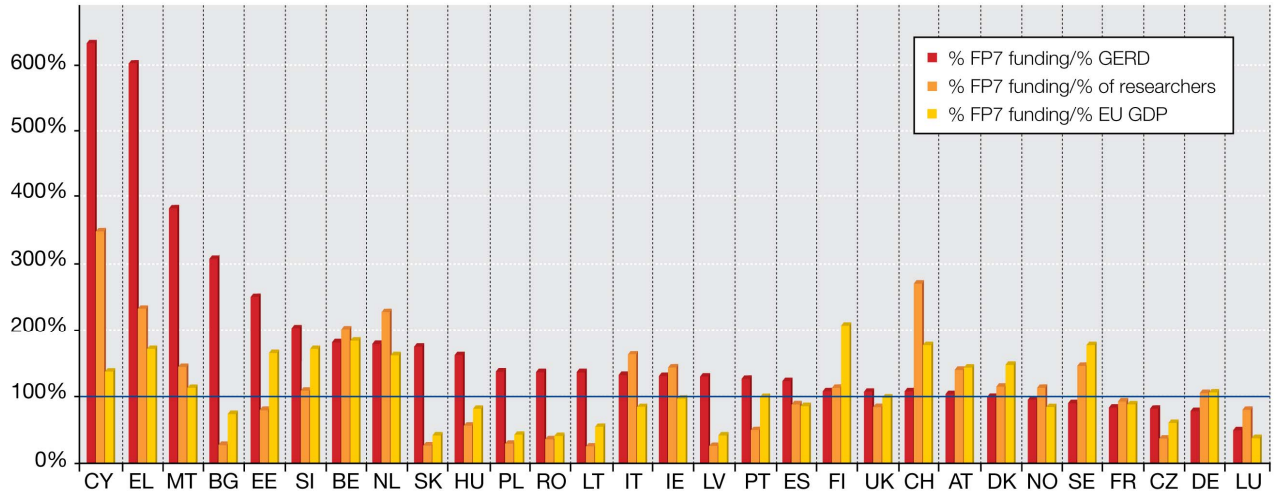
Source: DG Research & Innovation, Data for EU 27+NO+CH

Figure 7: Smaller MS benefit more from FP6 funding in relative terms



Source: DG Research & Innovation, Data for EU 27+ NO+CH

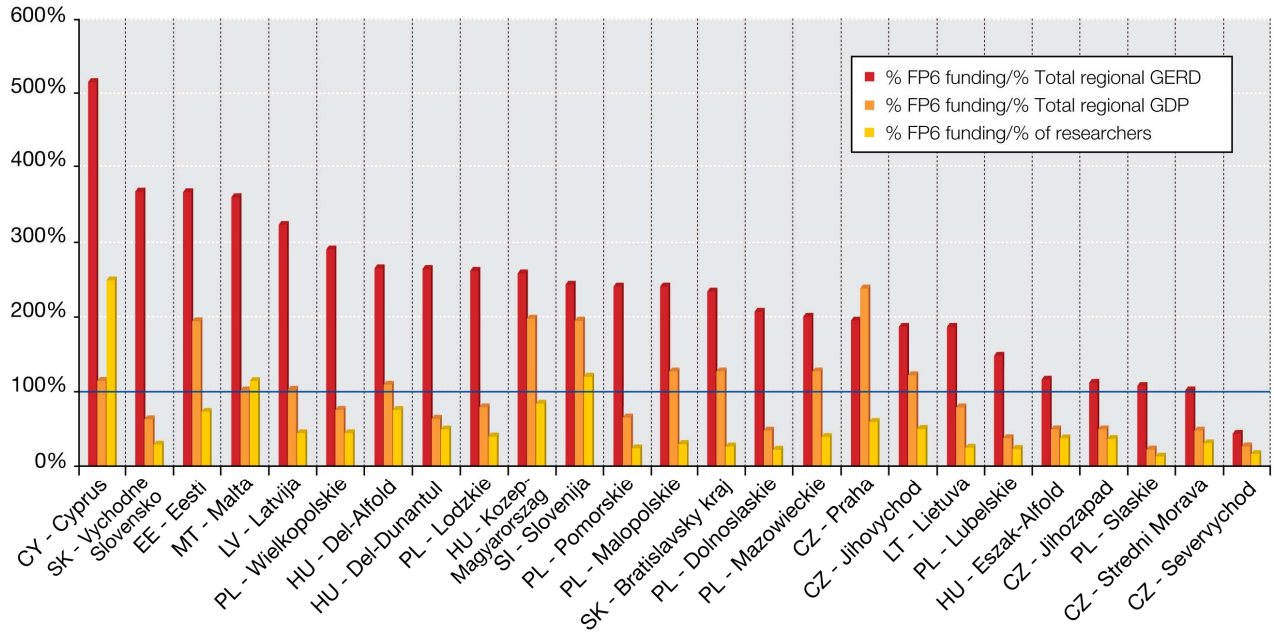
Figure 8: Smaller MS benefit more from FP7 funding in relative terms



Source: DG Research & Innovation, Data for EU 27+ NO+CH

At regional level as well, peripheral and less research-intensive regions obtain much more FP6 funding per euro of research investment (GERD) than more research-intensive regions. This is particularly true for EU-10 regions, which obtain up to 5 times more than their research investment would suggest (Figure 9). In conclusion, it could be put that FP is an important alternative source of funding for less favoured regions and contributes to filling in the investment gap.

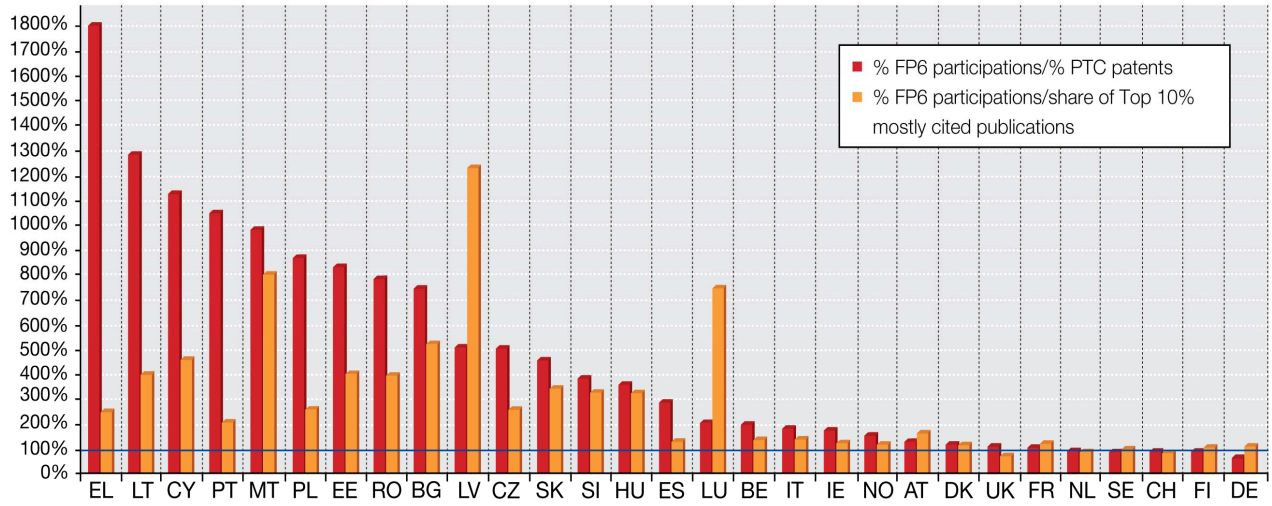
Figure 9: EU-10 regions benefit more from FP funding in relative terms



Source: DG Research & Innovation

New Member States also participate more intensely in the FP and receive more FP funding than their scientific (share of top 10% most cited publications) or technological performance (share of PCT (Patent Cooperation Treaty) patents) would suggest (Figure 10, 11, 12 & 13).

Figure 10: New Member States participate more intensely in FP6 than their R&D output would suggest



Source: DG Research & Innovation, Data for EU 27+ NO+CH

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COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

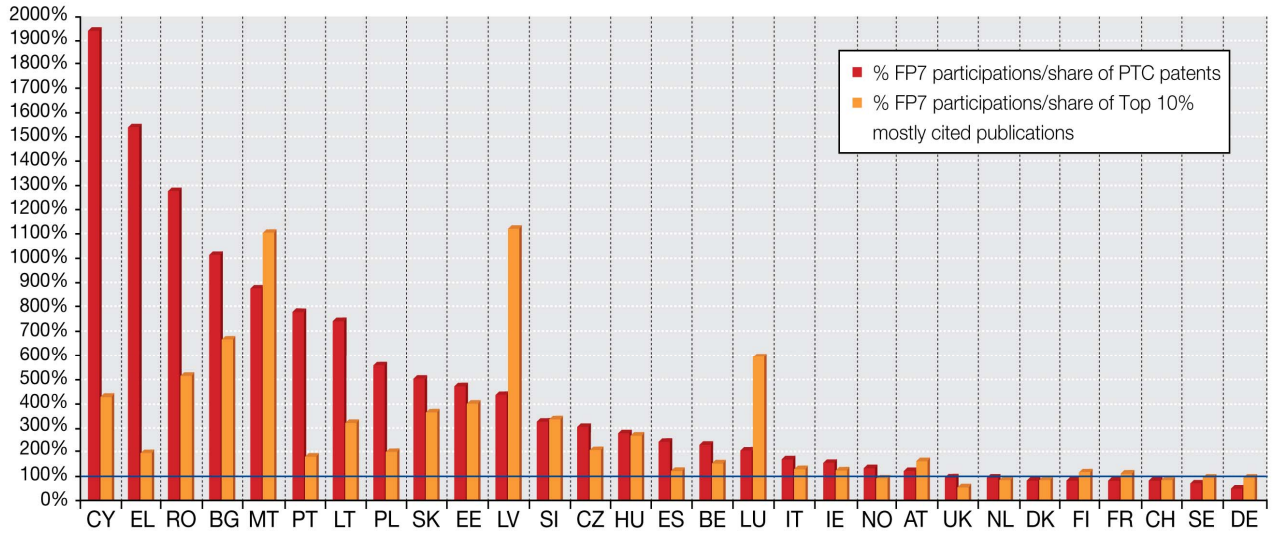
Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

Annexes

Annex 1: Past Achievements and Lessons Learned - Part C

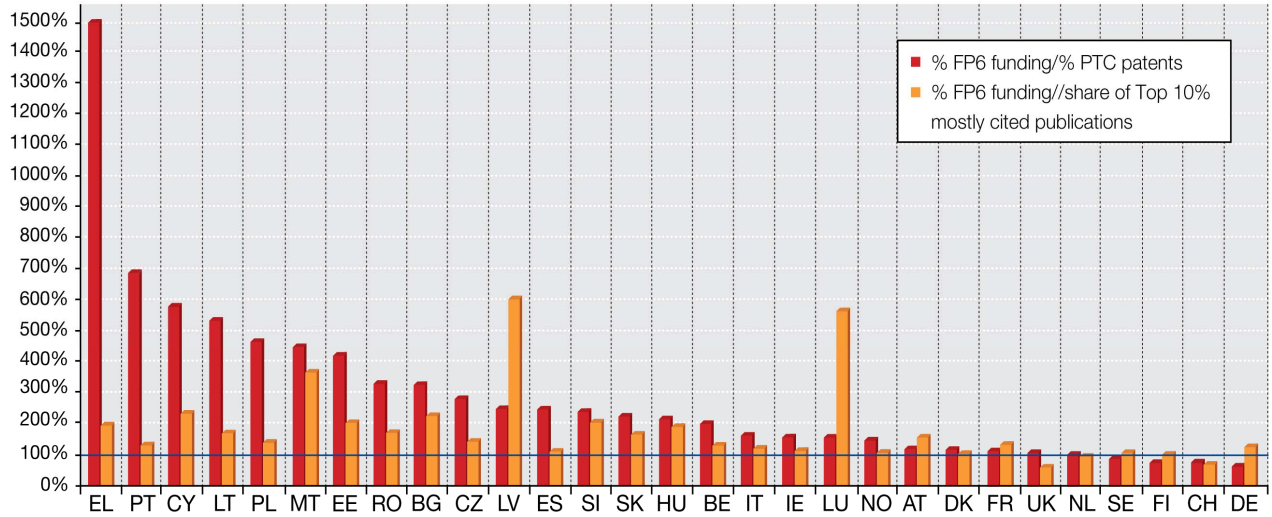
{COM(2011) 808 final}
{SEC(2011) 1428 final}

Figure 11: New Member States participate more intensely in FP7 than their R&D output would suggest



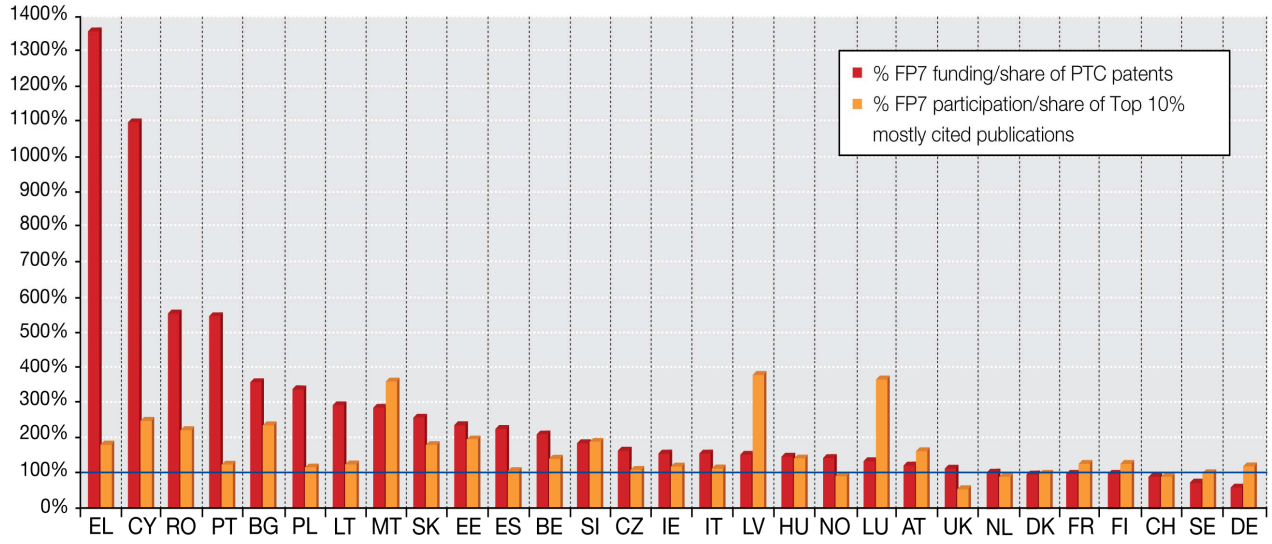
Source: DG Research & Innovation, Data for EU 27+NO+CH

Figure 12: New and Smaller Member States benefit more from FP6 than their R&D output would suggest



Source: DG Research & Innovation, Data for EU 27+NO+CH

Figure 13: New and Smaller Member States benefit more from FP7 than their R&D output would suggest



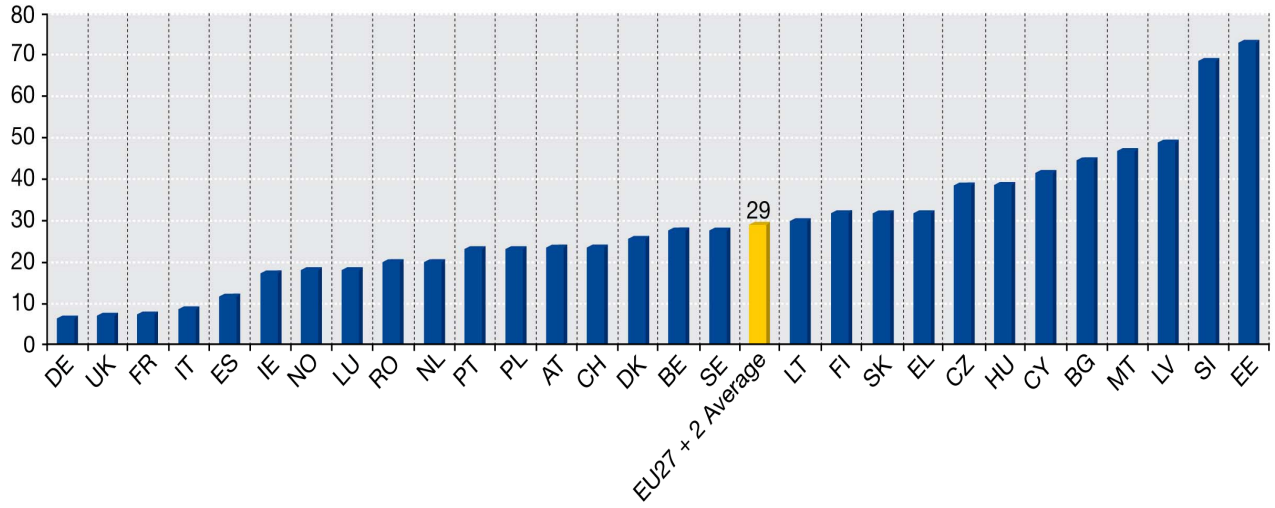
Source: DG Research & Innovation, Data for EU 27+NO+CH

- **The benefits from FP participations go beyond FP funding received: A Member State obtains, in average, 29€ of net knowledge return from every 1€ invested in the FP.**

  Participating in a FP collaborative research project offers access to EU-wide knowledge exchange networks. In other words, a single project participant benefits from and accesses the funding received by all project participants combined. An analysis of national knowledge returns from the FP, which takes account of the collaborative research network multiplier, shows that all countries enjoyed net positive knowledge returns under FP6. The average return was 29€ per 1€ invested for the EU 27, Norway and Switzerland (Figure 14). This represents an increase of about 8€ compared to FP5.

  The size of these returns tends to be inversely related to a country's number of FP participations. Countries with a smaller number of participations (smaller and new Member States) benefit from higher net knowledge returns than countries with a larger number of FP participations (larger EU economies). This is probably linked with the fact that smaller numbers of FP participations translate into a pattern of widely dispersed single participations per project, while a larger number of FP participations translates into a pattern where regularly two or three participants from a country are present in a project.

Figure 14: Net knowledge return per 1€ invested in the FP6



Source: *DG Research & Innovation,*
Note: *[Value of shared-cost contracts in which each country participating (no double counting))/Contribution to FP shared cost actions budget) – 1]; EU-27 + 2(NO and CH) contribution to FP6 shared-cost actions budget calculated on the basis of the shared of their GDP in the EU27+NO+CH GDP.*

THE FP INVOLVES TOP (A-TEAM) RESEARCHERS AND ORGANISATIONS IN HIGH-QUALITY RESEARCH

The FP6 ex-post evaluation (Rietschel et al., 2009) concluded that FP6 involved top-quality researchers in first-rate projects performing high-quality research. This conclusion was based on:

- **A FP-wide bibliometric study**: This study demonstrated that the publication and citation performance of FP project 'lead scientists' is better than that of their non-FP peers (EPEC, 2009).
- **Thematic bibliometric evidence**: An ex-post impact assessment of the 'Global Change and Ecosystems' sub-priority found, based on peer review and bibliometric indicators, that the work was of high scientific quality (EPEC, 2008).
- **The FP5&6 Innovation Impact study**: This study found that, compared to the average company in their sector, FP industrial participants are more R&D-intensive, more innovative, better networked and more focused on international markets, and patent more (Polt et al., 2008).
- **A FP6-wide participation survey**: This study found that participants with high and very high R&D capabilities represented around 80% of all FP6 survey respondents. Under FP5, the share was 60% (IDEA Consult, 2009c).
- **Self-assessments submitted to the FP6 expert group**: Twenty-four Commission research managers provided self-assessments to the FP6 ex-post evaluation expert group. Eight said independent reviews had confirmed that nearly all the research in their portfolio was of international standard. Another 7 said that at least two-thirds was of international standard.
- **The pan-European perception of the quality of FP-funded research**: In many countries, the receipt of FP funding is seen as a quality indicator for the scientists, research groups and organisations involved. For this reason, some research councils actively support EU applications while some universities provide matching funding.

- **The extra-European perception of the quality of FP-funded research**: Third country researchers have a positive image of the FPs in general and FP6 in particular. They associate the programme with top-class research and believe that the FP provides better career references for participants, is better in mobilising top-class researchers and institutes, and provides better funding opportunities than other similar (competing) programmes.

The FP interim evaluation (Annerberg et al., 2010) concluded that excellence seemed to have been at the heart of the great bulk of FP7 funded projects and reaffirmed the finding of the FP6 ex-post evaluation that EU funding is not just for the B-team, but attracts A-team members. This conclusion was based on:

- **An analysis of FP7 top funding recipients**: The FP7 interim evaluation concluded that "there can be little doubt that FP7 attracts the top EU researchers from universities and RTOs" since "the list of organisations that have obtained the largest amounts of funding from FP7 can be read as a *Who's Who* of European research quality".
- **An analysis of FP7 collaborative research proposal evaluation scores**: FP proposals are peer-reviewed and scored according to three criteria: scientific excellence, project management quality, and potential impact. The mean score for 'scientific quality' was 4.4 out of 5 (minimum 4) and the mean sum for the three criteria 13.1 out of 15, far above the minimum of 10 specified in the programme rules and according to the evaluation expert panel an objective measure of average proposal quality.
- **An analysis of ERC proposal evaluation scores**: The FP7 interim evaluation concluded that the ERC is attracting applications of high quality as some 56% of the total number of applications was evaluated as above the threshold set by the evaluation criteria.
- **Self-assessments submitted to the FP7 expert group**: Seven out of 10 self-assessments submitted to the evaluation expert panel said that 'nearly all' or 'a majority' of the research funded was world-leading. The other self-assessments said there was not yet enough information to judge.

The quality of FP participants is also demonstrated by an analysis of FP participation data:

- **The FP supports Europe's industrial R&D champions**: All FP6 and FP7 shared-cost action top industrial participants (in terms of funding, in terms of participations) are European companies figuring in the ranking of 'Top 1000 Global R&D Investing Firms'.[1] The top FP6 industrial participant, for instance, was Siemens AG (€46,4 million, 150 participations) while the top FP7 industrial participant so far is SAP AG (€53 million, 55 participations).
- **The FP funds Europe's most excellent universities**: About half of the 50 FP6 shared-cost action top university participants rank among the world's best 100 universities while 94 percent rank among the world's best 400 universities (Academic Ranking of World Universities 2010). The top 100 European universities in the 2008 Leiden ranking received about half of the FP7 funding disbursed at that time to European higher education institutions.
- **The FP provides support to Europe's leading public research centres**: Leading European public research centres like the Max Planck Gesellschaft, the Fraunhofer Gesellschaft, the CNRS and the Commissariat à l'Energie Atomique are top FP participants occupying key positions in FP projects and networks. Under FP6, for instance, these four institutes accounted for €562,9 million of funding and 1244 participations.
- **The FP connects Europe with global centres of excellence**: 8 of the world's top 10 non-European universities (Academic Ranking of World Universities 2010) participated in FP6 and FP7-funded collaborative research: MIT, the California Institute of Technology, and the Universities of Harvard, Berkeley, Princeton, Stanford, Columbia and Chicago. Moreover, in both FP6 and FP7, one could find other world centres of excellence participating like the Universities of Tokyo and Kyoto, Universities of Toronto, British Columbia and Melbourne, as well as Australian National University.

Other evidence concurs:

- According to a Dutch FP impact study (Technopolis), "bibliometric research and over 100 interviews held in the Netherlands, confirmed that the European research programmes produce high quality research and attract the best European researchers".
- According to EC-commissioned study on ICT research performance in FP (Bocconi University, 2010): "*DG INFSO projects have been highly effective in attracting top quality researchers and research teams from the research fields relevant for the ICT area"*.
- As demonstrated by a study analysing participation of Top European universities (selected with Leiden crown indicator) in the FP6 they had a key role in terms of participation and funding, with a leading role in coordination of projects (JRC-IPTS, 2009).

FP RESEARCH IS OFTEN HELPFULLY INTER-DISCIPLINARY

- There is substantial evidence that inter-disciplinary research is more productive than mono-disciplinary research. In this respect, the FP7 interim evaluation (Annerberg et al., 2010) concluded that the FP promotes cross-disciplinary research in an implicit and generic way through work programmes and calls for proposals that target certain problems, challenges or application areas. Virtually all Commission self-assessments submitted to the evaluation expert panel gave scores of 5 or 6 out of 6 for cross-disciplinarity.
- An EC-commissioned evaluation of FP6 environmental research (EPEC, 2008) concluded that several projects addressed new issues and initiated new approaches, in particular research with a strong interdisciplinary component.

THROUGH THE FP, LARGE NUMBERS OF SCIENTISTS ARE TRAINED

- Training is the core preoccupation of the FP's **Marie Curie actions**, which promote cross-border, cross-sectoral and cross-disciplinary researcher mobility, as well as skills and career development:
  - The FP6 ex-post evaluation (Rietschel et al., 2009) noted that FP human resource actions are almost universally judged to be a major success. FP6 human resources and mobility schemes involved 8, 000 organisations and supported some 12,500 fellows.
  - The FP7 interim evaluation (Annerberg et al., 2010) noted that the specific programme People is making a valuable contribution to the development of researcher human capital and that "the Marie Curie actions, through their bottom-up approach, have promoted excellence and have had a pronounced structuring effect on the research landscape". In the period 2007-2010, 38 calls were launched and concluded in People programme resulting in nearly 5,500 projects retained for funding. During that period, over 6,400 researchers benefited from individual fellowships and grants to enhance their career prospects. Nearly 400 ITN and IAPP networks were selected for funding providing training and knowledge transfer to more than 6,500 researchers.
  - The German Federal Ministry of Education and Research noted that the FP offers good opportunities for supporting upcoming scientists. Young scientists become involved in international research networks and have the opportunity to perform research at foreign institutions within the framework of mobility programmes. In particular, universities and non-university research institutions emphasize the opportunities for supporting young talent through participation in the mobility programmes (Federal Ministry of Education and Research, 2009).
- There is a training element in **European Research Council** advanced grants, with preliminary analysis of the financial reports revealing that advanced grant teams typically consist of two doctoral students and two post-docs in addition to the principal investigator (Annerberg et al., 2010).

- Training is also provided through the FP's **research infrastructure** actions, which facilitate access to unique and expensive infrastructures of European importance. Nine out of 10 researchers say that without FP funding they would not have been able to access vital research facilities, which is often a precondition for successful frontier research. Under FP6, about half of the 26 000 users who benefited from access were young researchers (undergraduate, postgraduate and post-doc). This highly trained personnel forms an invaluable human capital resource for serving current and future industrial needs (Table 3).

Table 3: Status of users at research infrastructures during FP6

Researcher status	Total	%
Experienced researchers	12 804	49
Post-doctoral researchers	4 633	18
Post-graduate	7 050	27
Undergraduate	1 275	5
Technicians	303	1
Total	26 065	100

- Large numbers of scientists have been trained through FP-funded **collaborative research**:
  - According to an EC-commissioned evaluation of the FP5 Growth programme, projects had generated or were expected to generate 2,152 doctorates (Ramboll Management and Matrix Knowledge Group, 2008).

The **CASCADE** Network of Excellence (FP6) - a highly multi-disciplinary network dealing with chemical contaminants - developed an extensive training featuring a wide array of scientific disciplines, including risk assessment, toxicology, biochemistry, molecular biology, mouse genetics, in-silico and in-vitro methodologies that led to the establishment of an international post-doc programme (CASCADE-FELLOWS).

  - According to a survey among FP5-7 project coordinators in the areas of Food, Agriculture and Fisheries and Biotechnology research, almost 80% of projects trained at least one PhD student and 73% at least one post-doctoral researcher. 18% of projects trained more than 10 PhDs, which provides evidence of the impact of the FP on the training of young researchers. Significant efforts were also made the train other personnel: over 50% of projects trained graduate, technical and administrative personnel (EC, 2011h).
  - According to an Austrian FP impact study (Technopolis, 2010b), "it is important to note that training of young researchers not only occurs in the human resources oriented measures (People Programme and ERC Starting Grant) but also in the 'traditional' cooperative FP projects".
  - According to an Irish evaluation of FP6, each project produced, on average, 2.3 newly trained/qualified personnel (Forfas, 2009).

THE FP IMPROVES PARTICIPANTS' R&D AND INNOVATION CAPABILITIES

- The FP7 interim evaluation (Annerberg et al., 2010), referring to a UK evaluation of the FP identifying important participant capability impacts (see below), considered it "reasonable to infer that similar outcomes will have occurred elsewhere".
- A study of FP6 behavioural additionality (IDEA Consult, 2009b) found that FP-funding increased FP participant organisations' ability to network with universities, public research institutes and firms; that FP project management experience was already or would be used in other R&D and innovation projects within the organisation; and that FP-funding helped to formalise the R&D and innovation processes, in particular for very small and young organisations and for organisations coming from candidate countries.
- A study of the impact of FP6 on new Member States (COWI, 2009) found that FP6 "had an important impact on research organisations' interests and capacity in networking and … inspired a networking approach to the management and implementation of research projects with more focus on cooperation, consortia- creation, multi-disciplinarity, communication and management skills". It also produced "an

increase in skills and research capabilities of its key research staff" and resulted in the "development of administrative capacity/competence to handle international project management processes".

- A FP6-wide participant survey (IDEA Consult, 2009c) concluded as follows: "The learning effects of participating in a project under FP6 appear to be high for individual organizations. Much of the experience gained, both technological and managerial, can and will be used again in future R&D projects".
- A survey among FP6-IST programme participants (WING, 2009) found that more than 80% of participants consider that EU projects have enabled them to significantly extend their knowledge base and RTD capability, develop new skills and competence and explore new technology paths that they would have not addressed otherwise. The same share of participants highlighted the important impact of their FP participation on networking and the building of new long-term strategic partnerships allowing them to gain access to complementary expertise.
- The same survey-based study (WING, 2009) showed that around 75% of industrial participants found that their participation has helped improve their innovation capacity and explore new opportunities, including the successful re-use of knowledge developed within projects in another context (WING 2009).
- An Irish evaluation of FP6 participation (Forfas, 2009) found that "the primary benefits came in the form of improved relationships and networks, increased knowledge and capabilities (both scientific and technological), and enhanced reputation and image".
- A Spanish evaluation of FP6 participation (Zabala Innovation Consulting SA (2010) found that "for 52% of the surveyed researchers, participation in the FP6 contributed to strengthening their research teams, above all due to the scientific excellence offered by the acquisition of capabilities and abilities during the project".
- A Swedish longitudinal evaluation of FP participation (VINNOVA, 2008) found that "FP money has been one of the factors enabling the [automotive] industry in general, and Volvo AB in particular, to maintain the high level of technological capabilities that have so far protected vehicles design and production activities in Sweden, which from a scale logic are anomalous". It noted that "the survey confirmed the earlier finding that capacity building was an important aspect of the FP projects and also showed more clearly that participants were involved because of the opportunities for technical learning offered".
- A UK evaluation of FP6 and FP7 found that the FP has a big impact on the nature and extent of UK researchers' international relationships and networks, as well as on their knowledge base and scientific capabilities. Other notable outcomes include increased scientific reputation, an improved ability to attract and retain world-class researchers and a positive impact on researcher careers. Lastly, FP has a positive impact on the attitudes, outlook and connectedness of individual researchers, as well as serving as a training ground for project management and administration.

THE FP PRODUCES LARGE NUMBERS OF HIGH-QUALITY, OFTEN COLLABORATIVE SCIENTIFIC OUTPUTS

- According to an EC-commissioned evaluation of the FP5 Growth programme (Ramboll Management and Matrix Knowledge Group, 2008), projects had generated or were expected to generate 18,974 publications.
- According to an EC-commissioned study on FP6 network effects (AVEDAS et al., 2009), the number of publications produced between one year after the starting month of the project and the end of 2007 by the principal investigators of 2003-2005 FP6 projects (n=1,312) amounted to 32,466.
- According to the same study, FP6 projects produced increased co-publication activity between project partners, i.e. two partners from the same FP6 project published one or more articles together after having participated together in FP6. Publications from FP6 principal investigators, either with or without other FP6 partners, had a 50% higher impact than the world average. Co-publications by collaborating FP6 partners had significantly higher impact (around 2 times the world average) than publications in which FP6 partners did not co-publish.

- According to an EC-commissioned evaluation of FP6 environmental research (EPEC, 2008), EU environmental research is leading in several environmental research areas. According to peer reviewers, the scientific and technological impact of EU environmental research is particularly high for projects in three areas: climate change (4.6/5), water and soils (4.5/5), and natural hazards (4.4/5). According to a bibliometric analysis, three areas of EU environmental research can be distinguished for their higher impact factor: climate change, water and soils, and biodiversity and ecosystems. Climate change in particular is the area in the sub-priority "global change and ecosystems" that receives the highest ranking in almost al types of impact, especially as regards scientific impacts. All projects in the Climate change area are unanimously qualified as being of high scientific quality, producing "excellent new science".
- According to a German evaluation of FP6 (Federal Ministry of Education and Research, 2009), scientific personnel participating in FP6 stated that a substantial part of their publications was due to their participation in the FP.
- According to an Irish evaluation of FP6 (Forfas, 2009), each project produced, on average, 12.7 publications (of which 5.3 in refereed journals and books) and 5.2 conferences, seminars or workshops.
- Bibliometric analyses of FP6 projects (EPEC, 2009) indicate a high productivity of papers in high-quality journals by FP funded scientists in the *Food, Agriculture and Fisheries and Biotechnology* area. For FP6 Food, coordinators were found to perform better than non-FP funded peers.
- The results of survey performed by DG Research & Innovation among FP5-7 coordinators showed that the EU funded research in Food, Agriculture and Fisheries and Biotechnology area produced on average 4.4 publications per project. Some projects have produced particularly high numbers of publications in peer review journals (e.g. 400 publications by fisheries projects SEAFOODPLUS and IMAQUANIM; 120 publications by the agriculture FP6 project EUSOL).
- An analysis undertaken by the EC showed that around 50% of all FP6 projects in the domain of ICT produced at least one scientific article included in a high-impact journal (ISI Web of Science - ISI WoS) database and that 82% of projects produced at least one other publication outside the WoS database. For FP7-ICT, the share of projects reporting at least one scientific article in the ISI WoS database was 32% (at the end of the first two years of the programme), and 71% of projects under FP7-ICT produced at least one other publication outside of the ISI WoS database.

THE FP PRODUCES NUMEROUS TECHNOLOGICAL OUTPUTS AND INNOVATIONS

- For firms, FP collaborative research projects are more than self-financed collaborative research projects focused on risky, complex and long-term exploration rather than on short-term exploitation. So firms participate in the FP mainly to achieve knowledge- and technology-related objectives, less to achieve direct commercialisation-related objectives. In addition, FP projects are not and should not be assessed as stand-alone R&D activities; they form part of a wider portfolio of R&D projects.
- Notwithstanding the above, the FP has a significant positive impact on innovation and competitiveness: FP-funded research produces large numbers of patents, innovations and micro-economic benefits:
  - An EC-commissioned evaluation of the FP5 Growth programme (Ramboll Management and Matrix Knowledge Group, 2008) found that – although exploitation was not the primary objective - exploitation objectives were achieved in 54 percent of the projects. Projects had generated or were expected to generate:
    - The creation of 248 spin-off companies
    - 3,724 prototypes, demonstrators, pilots
    - Some 7.2 billion euro additional sales
    - 891 million euro in cost reduction
    - 1,077 patent applications
    - 204 registered designs and other forms of IPR protection
    - The safeguarding of 37,588 jobs and 8,038 new jobs

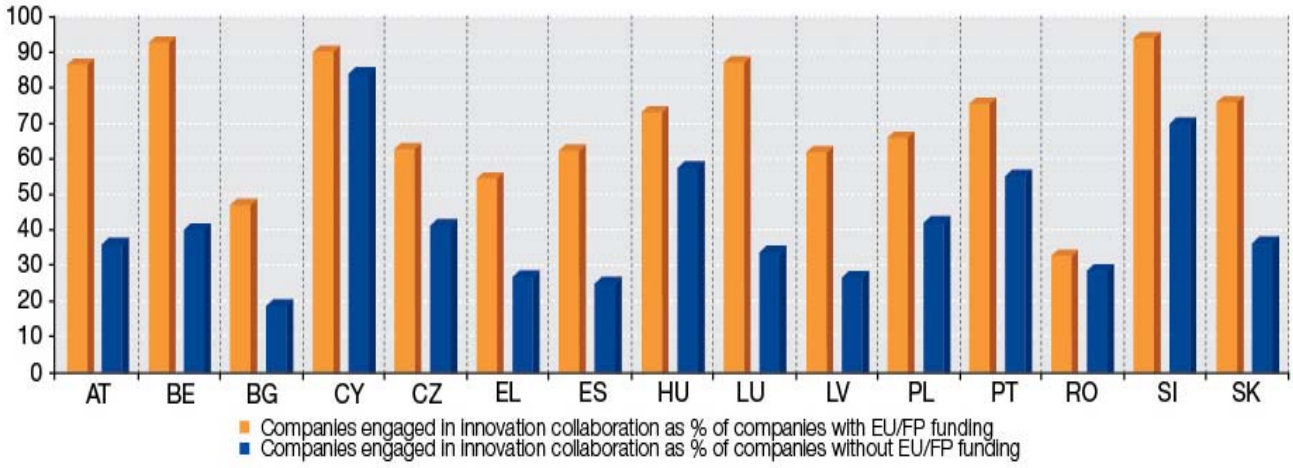
- 310 inputs into technical standards

- o According to an EC-commissioned study on FP6 behavioural additionality (IDEA Consult, 2009b), projects would have led to a smaller range of potential applications and a smaller number of marketable products if continued without FP6 funding.
- o According to an EC-commissioned study on FP6 network effects, FP6 resulted in increased competitiveness of the European Research Area because of inter alia the development of new and improved research methods and techniques and more commercial or industry-based approaches in the research. The same study found the following answers for the question "what outcomes has the FP6 led to that your organisation would not have achieved if it had not been involved in FP6?": "New or improved commercial products, services": about 2.8 out of 5; "Patents, intellectual property": about 2.9 out of 5.
- o According to an FP6-wide survey (IDEA Consult, 2009c), industrial organisations clearly expected commercial returns. Almost half of them (47 percent) stated they were likely to very likely, and 60 percent of this group expected these returns within 2 years (90 percent within 5 years).
- o According to the FP5&6 Innovation Impact study, a great majority of FP participants reported at least one form of commercialisable output (new or improved processes, products, services, standards) stemming from their FP project and a large number even recorded more than one of such outputs; an econometric analysis showed that the FP produces output additionality – a positive impact on the innovative sales of firms participating in the FP; and small and medium-sized enterprises indicated the most positive results in terms of innovation in FP projects.
- o According to a Finnish evaluation of FP6 (TEKES, 2008), "commercialisable output is not the core objective of the FPs but EU collaboration nonetheless contributes significantly to the creation of innovation".
- o According to a German evaluation of FP6 (Federal Ministry of Education and Research), scientific personnel participating in FP6 stated that a substantial part of their patent applications was due to their participation in the FP. Large, export-oriented companies as well as companies in the field of cutting-edge technology and the knowledge-intensive service sector were more likely to take part in FP6 than in federal or Länder programmes among other reasons because participation tended to have a positive effect both with regard to the extent of their own R&D activities and the commercial success of innovations.
- o According to an Irish evaluation of FP6 (Forfas, 2009), each project produced, on average, 0.1 patent applications, 0.4 new or significantly improved commercial product or services, and 0.4 new or significantly improved scientific or industrial processes.
- o A Swedish long-term evaluation of the FP (VINNOVA, 2008) found significant impacts on the ability to compete in vehicles and in electronics (especially telecommunications). In ICT, FP participation in European and global standardisation had been a key factor in building the Swedish telecommunications industry's position in mobile telephony, while in vehicles, the FP had, together with complementary national programmes, been instrumental in supporting the Swedish industry's technical specialisations, especially in safety and combustion.
- o According to a Swiss evaluation of FP5 and FP6 (State Secretariat for Education and Research, 2009), participation generated both knowledge and jobs.
- o According to a UK evaluation of the FP (Technopolis, 2010), a majority of UK business participants stated that their involvement in the FP had yielded important commercial benefits. In terms of immediate project outputs, a significant proportion of business respondents reported having made or gained access to new or significantly improved tools or methodologies and in a large minority of cases, firms reported the creation of formal elements of intellectual property. Beyond these immediate project results, around 20 percent of businesses stated that their participation had made significant contributions to the development of new products and processes and in around 10 percent of cases organisations reported increased income and market share. Lastly, company interviews suggested that

FP participation had made a significant contribution to the competitiveness of leading players in several niche technology markets, from inkjets to photonics.

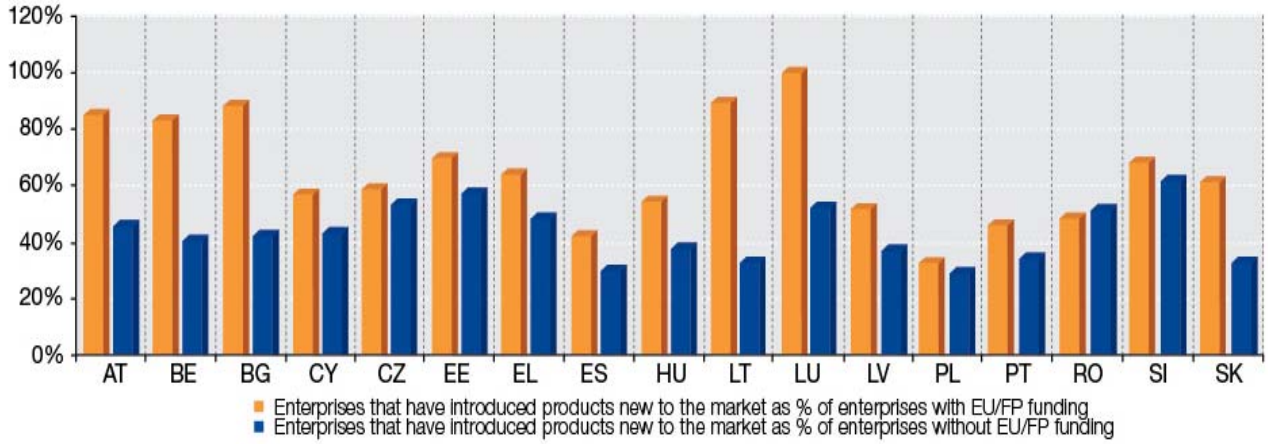
- An econometric analysis of Round 3 Community Innovation Survey micro-data covering 18 European countries carried out by the Joint Research Centre's (JRC) Institute for Prospective Technological Studies (IPTS) found that the FP has a positive impact on incremental innovation (new to the firm) and, even more, on radical innovation (new to the market). The FP fosters collaboration and has a positive impact on R&D intensity via collaboration and directly. The higher the R&D intensity, the more incremental and radical innovation.
- An analysis of 2006 Community Innovation Survey micro-data confirmed the above results by showing that FP participants collaborate more, patent more, and are more innovative than non-participants.
- The EC-commissioned analysis of Prospects for Research and Innovation in Food, Agriculture, Fisheries and Biotechnologies (Report from Independent Experts to the European Commission, 2011a) concluded that, scientific productivity in some FP6 Food research projects was combined with strong technological outputs (patents and innovation, in particular in biotechnology and food projects) and/or with attention to policy needs (in the remaining areas of research). This suggests a cross-fertilisation between science, technology and policy development that has contributed to excellence.
- The results of survey performed by DG Research & Innovation among FP5-7 coordinators (Coordinator Survey, 2010) showed that the EU funded research in Food, Agriculture and Fisheries and Biotechnology area produced on average 0.5 patent and 0.69 new innovative products per project funded.
- The EC-commissioned analysis of impact of FP agricultural and forestry research (Report from Independent Experts to the European Commission, 2011b), concluded that a significant proportion of projects had developed more "technological" than "scientific" results, the average of technological invention being four per project in FP6. Where the nature of the research allowed it, projects successfully delivered on patents and new products. For example in the area of plant health research nearly 15% of projects led to patent applications and 30% to commercial products, models and processes.
- An analysis of random sample of projects funded by Security Theme in FP7 showed that they produced 0.51 patents or other forms of Intellectual Property per project.
- Evidence from the Community Innovation Surveys shows that 340 firms from the manufacturing sector of food and beverages that have introduced a new product or new process have received funds from FP5 and FP6 programmes what suggest a significant role of the FPs funding in improving the innovation performance of firms

Figure 15: FP participants collaborate more than non-participants



Source: Eurostat- Note: Data concern manufacturing sector

Figure 16: FP participants are more innovative than non-participants



Source: Eurostat- Note: Data concern manufacturing sector.

EU RESEARCH & INNOVATION PROGRAMMES SUPPORT EUROPEAN AND NATIONAL POLICIES

- According to an EC-commissioned evaluation of the FP5 Growth programme (Ramboll Management and Matrix Knowledge Group, 2008), projects had generated or were expected to generate 423 inputs into EU legislative texts.
- According to an EC-commissioned evaluation of FP6 environmental research (EPEC, 2008), EU environmental research contributes to the knowledge base and development of methods and tools for environment related policy. The study found that:
  - At the international level, EU research related to climate change contributed to the International Panel on Climate Change (IPCC), either directly, through individual researchers involved in the IPCC review, or through references to EU-funded projects in IPCC reports.
  - In the domain of environment and health, there were strong links with EU policy priorities, most notably with the implementation of the Environment and Health Action Plan 2004-2010 as well as with the implementation of European Directives.
  - All natural hazards projects contributed to some extent to regional, national and European policies in the field of natural hazards, guidelines and standards.
  - Water and soil projects played a large role in the formulation and implementation of the Water Framework Directive.
  - Earth observation projects had direct impacts on policy-making through the use of their outcomes by stakeholders such as IPCC and WMO.
- According to an Irish evaluation of FP6 (Forfas, 2009), each project counted, on average, 0.4 new or significantly improved regulation or policy.
- Research in the field of security contributed to development of EU policies in the domains such as EU internal security, EU disaster response capacity, the EU CBRN and Explosives Action Plans, the Critical Infrastructure Protection, Health Security or also violent radicalisation, privacy and data protection. Since 2007 a total number of 20 Council and Commission policy documents reflect the use of security research resulting data (Table 4)

Table 4. Impact of FP7 Security Research as addressed in EU policy documents

	03/2011	2010	2009	2008	2007	
Commission Communications	1	3	2	2		**8**
Commission other policy docs	1		2			**3**
Council conclusions/ declarations			1	2	1	**4**
Council policy docs other		3	1	1		**5**
	2	**6**	**6**	**5**	**1**	**20**

Source: SG Vista + Council Secretariat

- According to a survey among FP5-7 coordinators in the area of Food, Agriculture and Fisheries and Biotechnology research (Coordinator Survey, 2010) more than 60% of FP projects have provided inputs to European policies, 56% to national policies, and 25% to international agreements.
- The analysis of the EURLEX database demonstrates that 73 separate FP projects in the fields of Food, Agriculture and Fisheries and Biotechnology where quoted 103 times by different EU produced documents. The average new decision support tool/policy recommendations per project is estimated to respectively 2, 1.7, 1 and 0,8 per project in the field of Fisheries & Aquaculture, Agriculture, Food and Biotechnologies (EC, 2011h).
- The analysis of FP5-FP7 funded research (Report from independent experts to the European Commission, 2011b) in plant and animal health has had a great impact on the further development of legislative measures governing disease surveillance, control and eradication, animal welfare and use of wastes. New methods were also developed which became initially European and later international standards. Results from the animal health projects have had a great influence on the work of the World Organisation for Animal Health (OIE), for example to develop international standards for disease control, animal welfare and trade, recognized by the World Trade Organisation (WTO).
- The analysis of FP5-FP7 funded research (Report from independent experts to the European Commission, 2011c) in the fisheries and aquaculture areas has had significant impact on the formulation and implementation of the Common Fisheries Policy, in particular with regards to developing the scientific basis of fisheries management, monitoring of stocks, environmental requirements and developing sustainable aquaculture with an increased involvement of research institutes from Mediterranean Partner countries, new member states and candidate countries.

THE FP PRODUCES STRUCTURING EFFECTS: DURABLE CHANGES IN THE EUROPEAN RTDI LANDSCAPE

- **Through the FP, the European Research Council was created, which promotes excellence across Europe:**
  - The European Research Council would not have been created without an EU initiative. The EU would then have been left with a landscape of compartmentalized national research councils, but would have had no funding mechanism to promote EU-wide competition for funds and to encourage higher scientific quality in frontier research.
  - The FP7 interim evaluation (Annerberg et al., 2010) noted that there is evidence suggesting that a level of compatibility (even calibration) has developed between the ERC and national research councils as the latter increasingly 'accept' the ERC evaluation results as a basis for awarding grants to highly-rated researchers who fail to be funded by ERC. The ERC suggests that national research councils or agencies are adopting similar funding schemes to the ERC model, and ERC grantees are often offered improved conditions by their host institutions, while ERC applicants are offered national funding.
- **Because of the FP, the EU leads in the creation and use of research infrastructures of pan-European importance:**
  - Thanks to EU leadership, for the first time, a pan-European strategy on research infrastructures (the so-called ESFRI roadmap) has been developed and is now being implemented. No less than 10 next generation European infrastructures [e.g. IAGOS (In-service Aircraft for a Global Observing System), ESS (European Spallation Source) and SHARE (Survey of Health, Ageing and Retirement in Europe)] are currently being built by groups of Member States and these facilities would not have seen the light

of day if it were not for EU action. In addition, without EU funding measures to facilitate access to unique and expensive infrastructures, 9 out of 10 researchers say that they would not have been able to access vital research facilities, which is a often a precondition for successful frontier research. For example:

- The IA-SFS project has created the largest network of free electron lasers and synchrotrons in the world, serving several thousand European scientists and allowing a wide range of applications.
- The European Grid Infrastructure gives European researchers access to the aggregated processing power of 200 000 computers in the world's largest distributed computing infrastructure ever built, with over 290 sites in more than 50 countries.

o The Global Monitoring for Environment and Security (GMES) provide the EU with independent data and products that assist in emergencies, support crisis response and allow to benefit from 'global' economies of scale, i.e: .the 'Urban Atlas' service developed in GMES, allowed a ten-fold reduction of mapping costs of urban areas.

- **Thanks to FP mobility and career actions, a framework for training and career development of researchers and free movement of knowledge is being created**:

o The Marie Curie Actions set standards for innovative research training, provide right skills for researchers to match the market needs and promote attractive career development for researchers from all nationalities at all levels of their career;

o The Marie Curie programme sets standards of attractive employment conditions open recruitments for all EU-researchers, and aligns national fellowship programmes to the principles of the European Researchers Charter and Code of Conduct for the Recruitment of Researchers through the co-funding mechanism.

- **The FP makes it easier for private companies to develop and implement joint strategic research agendas, which help to boost their competitiveness and stimulate smart, sustainable and inclusive growth:**

o An important achievement of the Framework Programme has been to establish instruments and mechanisms (e.g. European Technology Platforms, Joint Technology Initiatives) that facilitate the joint development and implementation of strategic research agendas by the private sector and for public-private partnership. These strategic research agendas have played a key role in boosting the competitiveness of the sectors involved.

o The FP6 ex-post evaluation (Rietschel et al., 2009) noted that initiatives like European Technology Platforms (ETPs) were clearly useful and successful: these trans-national focusing devices and smaller-scale efforts at policy coordination helped stakeholders identify and explain their needs jointly, eased the process of developing mutually supportive policies at European and Member State levels, and were likely to lead to changes in funding patterns.

The FP7 interim evaluation (Annerberg et al., 2010) noted that JTIs have focused and aligned key actors in their respective areas, serving as a support to develop coherent sectorial strategies. In the case of ARTEMIS and ENIAC, these aligning processes have involved new actors, including SMEs that have previously not taken part in strategic discussions at European level

- **The FP helps bring together compartmentalized national research funding across borders so as to achieve the scale needed to tackle important societal challenges:**

o One of the pioneering achievements of the Framework Programme has been to establish instruments and mechanisms (e.g. ERA-NET, Article 185) for the joint programming of Member State research. This has led to a new approach to research funding involving countries pooling and coordinating their own national funds across borders.

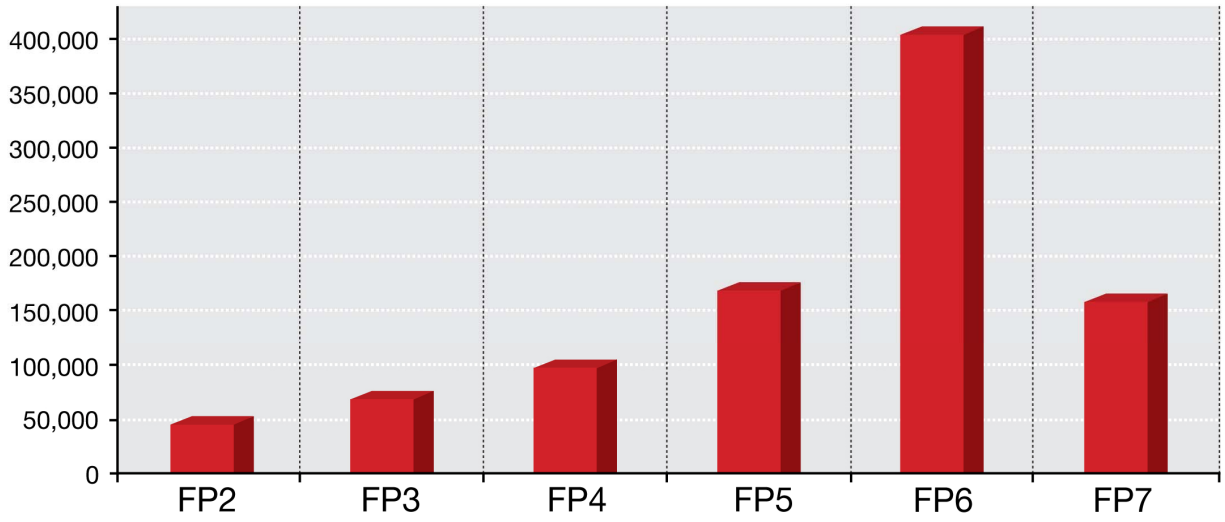
o The FP6 ex-post evaluation (Rietschel et al., 2009) noted that initiatives like ERA-NETs were clearly useful and successful: these trans-national focusing devices and smaller-scale efforts at policy coordination helped stakeholders identify and explain their needs jointly, eased the process of

developing mutually supportive policies at European and Member State levels, and were likely to lead to changes in funding patterns.

- According to the same FP6 ex-post evaluation, ERA-NETs considerably changed the views of policymakers and implementers. ERA-NETs enabled RTD funders to appreciate the value of cooperating and coordinating research activities and to change their practices. ERA-NETs enabled cooperative priority setting by sharing strategic intelligence. ERA-NETs encouraged the synchronisation of national research programmes. Small countries like Norway found that ERA-NETs enabled them to fill gaps in the national research portfolio and increased the exposure of national research performers to competition. Many of the ERA-NETs made good progress toward issuing joint calls and added value to the European RTD funding portfolio. In some cases joint calls involved large amounts of money and in a handful of areas the common programming which resulted was in areas of national significance, producing quite large calls, e.g. €35m and €15m in the Plant Genomics network.
- An evaluation of ERA-NET Plus – which facilitates joint calls through topping up the joint national funding with FP7 funds (33% of the joint call) - found that it is contributing to the pooling national resources, succeeding in bringing together efforts to meet joint challenges, and acting in some cases as a bridging mechanism (Annerberg et al., 2010).
- An Interim Evaluation of the 'Ambient Assisted Living' (AAL) Article 185 concluded that it made progress towards its objectives and that its overall direction was positive. The evaluation report added that it was a remarkable achievement that, in just a few years, the countries supporting the AAL programme engaged in such close cooperation. It was strong evidence of their interest that they increased their financial contributions significantly beyond the minimum required. AAL also achieved a high level of SME participation at about 40% compared with less than 20% in the first call of the FP7 ICT & Ageing Programme (Annerberg et al., 2010).

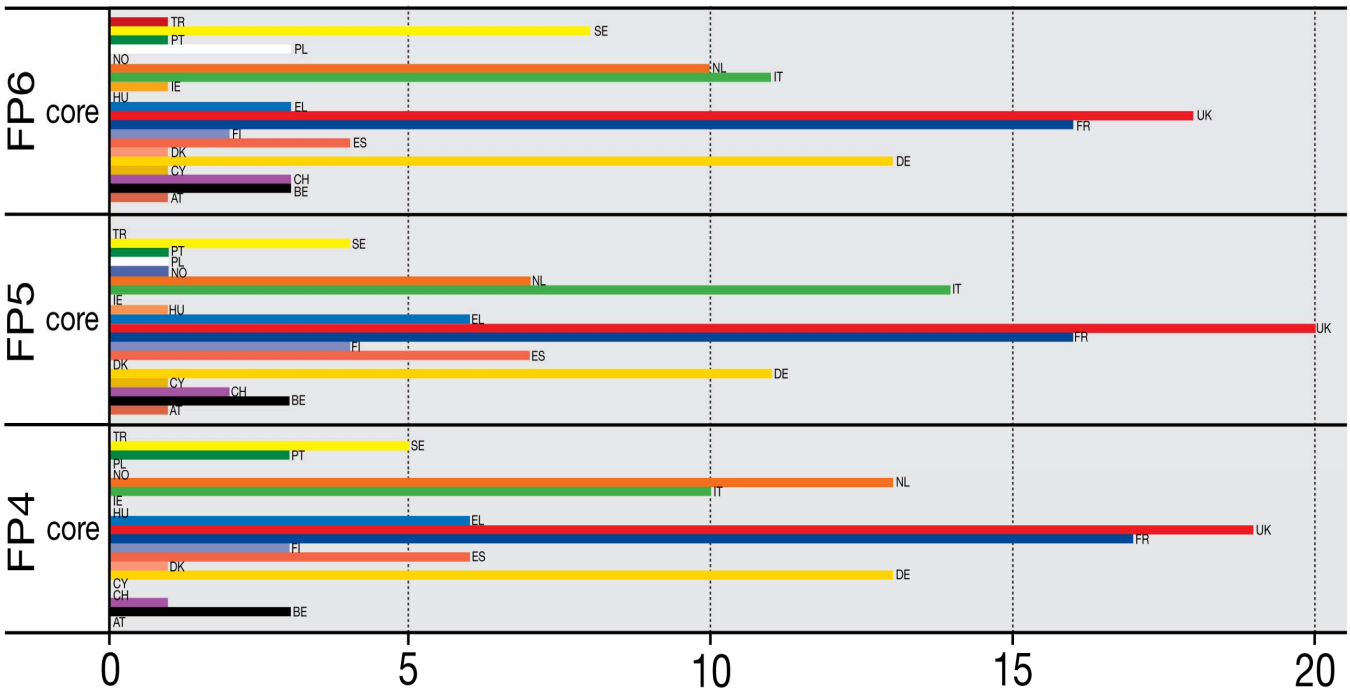
- **FP-funded collaborative research produces cross-border, cross-sectoral, inter-disciplinary networks that are durable, well structured, and well integrated into global innovation networks:**
  - ***The FP produces large numbers of cross-border links and networks:***
    - JRC-IPTS (2011) argues that the "FPs have been pivotal for transforming informal nation-based networks of research collaborations within epistemic communities of academics and industrial researchers into formal collaboration arrangements between organisations at European level. The networks formed by the organisations have become almost as important an outcome of FPs as the scientific and technological results of research projects conducted by them".
    - Protogerou et al. (2010) found that ICT collaborative research funded under FP4, FP5 and FP6 had produced complex networks and that the introduction of new instruments in FP6 had considerably increased interconnectivity compared with the previous FPs, thus contributing to the implementation of the European Research Area initiative.
    - An analysis of FP participation data shows that under FP6, the number of trans-national collaborative links reached 400 000 (Figure 17), more than double the number of links created under FP5. This increase of connections in FP6 is due to a changing dynamic at the project level: the average number of participants per project doubled from FP5 to FP6 and the average number of Member States per project increased from 4 to 6 (Table1). After four years of implementing FP7, the number of collaborative links almost reached that of FP5, namely 154.000. However it seems that at the end of FP7 less collaborative links will be created than under FP6, as the projects, in average engage less participations.

Figure 17: Collaborative links (national+international) established through FP funded shared-cost actions



Source: DG Research & Innovation
*Note: * Partial FP7 data (to 01.2011);*

Figure 18: FP core organisations: percentage distribution by countries and FP



Source:JRC IPTS (2011)

o ***The networks created by the FP are well structured:***

- JRC-IPTS (2011) shows that, over time, FP collaborative research networks have increased in size and created a highly dense and integrated structure. At the core of this structure, well-connected organisations (mainly higher education organisations and research centres) are situated, which not

only participate in a large number of projects but are also directly linked with a large number of other core organisations and local partners. These key FP players come from across the EU and associated countries but the majority are from France, Germany, the United Kingdom, Italy and the Netherlands (Figure 18).

- The same study shows that this group of key players, which participate in most projects and create most collaborative links, has not been renewed since FP2 (table 5).
- Protogerou et al. (2010) found that ICT collaborative research funded under FP4, FP5 and FP6 had produced complex networks structured around a core of organizations, mainly universities and research institutes assuming a very influential role over time.
- The FP6 ex-post evaluation (Rietschel et al., 2009) found that, in the area of IST, FP-funded projects had produced networks involving key 'hubs' (for example, the Fraunhofer Institutes) connected to large numbers of participants.
- An EC-commissioned FP6-wide study of FP6 network effects (AVEDAS et al., 2009) found that there was a high degree of organisational embeddedness and network stability in the FP. In each of the five FP6 thematic areas, there was a small number of closely-knit organisations in the core that dominated the network, i.e. they were highly connected to one another through several projects, while the remaining organisations were in the network periphery and connected to the core but not connected to one another. The actors in the core – the central actors coordinating the projects – were primarily large national research associations (e.g., Fraunhofer Gesellschaft, CNRS, INSERM) and universities in all thematic areas except in IST where industry was also a central actor.

o ***The networks created by the FP are durable:***

- According to an EC-commissioned FP6-wide survey (IDEA Consult, 2009c), 56 percent of respondents had already participated in FP5. In addition, 86 percent of respondents said they would continue to collaborate with other members on new activities after the network funding had been discontinued, demonstrating the value placed on the relationships that had been built.
- In the same vein, a study by JRC-IPTS (2011) shows that the share of organisations 'returning' to the FP increases from one FP to another reaching 50% in FP6 (Table 5). This points to a perfect balance between network stability and renewal.

Table 5. Distribution of returning actors and new entrants within the 100 core organisations (%)

	FP1		FP2		FP3		FP4		FP5		FP6	
	Core	All	Core	All	Core	All	Core	All	Core	All	Core	All
Old Boys	0	0	87	23.3	100	36.9	100	26.5	100	34.6	100	49.4
New Entrants	100	100	13	76.7	0	63.1	0	73.5	0	65.4	0	50.6

Source: JRC IPTS (2011)

o ***The networks created by the FP are well integrated into global innovation networks:***

- In the area of IST, the FP6 ex-post evaluation (Rietschel et al., 2009) found that there was a strong overlap between FP networks and patenting and ICT business networks pointing to the fact that the FP is well integrated into global innovation networks.

- **FP mobility actions promote the same kinds of durable cross-border, cross-sectoral, inter-disciplinary networks:**

o The FP6 ex-post evaluation (Rietschel et al., 2009) noted that by establishing working relations across Europe's knowledge infrastructure, Marie Curie actions have been a major driver towards the ERA and also provided opportunities for European researchers to build long-term relationships with colleagues outside Europe.

- According to the survey launched among Marie Curie fellows in FP6 (The Evaluation partnership, 2010), 90% of them considered that the grant helped them to make significant new professional contacts and 70% of them intended to maintain these links.

- **The FP structurally increases the attractiveness of Europe as a place to carry out research:**
  - The FP7 interim evaluation (Annerberg et al., 2010) noted that the specific programme People has been an important instrument to make Europe attractive to the best researchers and to implement the EU's career development policy.
  - It also noted that, according to an analysis by the ERC Executive Agency, a significant share of all applicants have been working in the US, indicating that the programme is having an effect on attracting top researchers back to Europe.

- **Indirectly and directly, the FP influences the design of Member State research policies, especially in the EU12:**
  - Marie Curie Actions set a valuable bench-mark for the working conditions and employment standards of EU-researchers with active participation in the 'European Partnership for Researchers' and the 'Code of conduct for the recruitment of researchers', promoting mobility and better careers for researchers in Europe.
  - The Open Method of Coordination (OMC), including exercises such as policy mix peer reviews, helped Member States devote more effort to the Barcelona goal.
  - The Science in Society programme had some remarkable structuring effects on ERA in the field of participatory technology assessment, capacity-building of civil society organizations, and promoting open science in academic journals.
  - According to an EC-commissioned study on the impact of FP6 on the EU12 (COWI, 2009):
    - Several new Member States (especially Poland, Lithuania and Romania) have been inspired by the FP to take a more networked approach to funding, moving from single-beneficiary to multi-beneficiary projects.
    - In several new Member States (e.g. Romania and Lithuania, and to lesser extent also Poland, Czech Republic and Slovenia), FP6 priorities have effectively substituted 'national' priorities.
    - In some of the new Member States (Romania, Lithuania, Poland), FP6 has been a vehicle for a transformation and re-orientation of the research policy planning where the programmatic qualities of the FP6 have been used. These qualities include: (1) the strategic and 'applied' approach to research with priority areas; (2) the planning horizon (e.g. adopting a 2007-2013 time horizon); (3) the evaluation procedure for national research proposals.
    - To stimulate an international reorientation of national research, some countries (Romania, Lithuania, Poland) reward submission of FP6 proposals in national research evaluation procedures, using a standardised 'uplift' (for instance in Romania, where an FP6 submitted proposal automatically receives a 5 point bonus; out of 100 points).

THE EU RESEARCH AND INNOVATION PROGRAMMES PRODUCE LARGE MACRO-ECONOMIC IMPACTS

Studies show that EU funding produces large macro-economic impacts:

- See **Annex 5**: An extensive body of academic economics literature has demonstrated that R&D produces large-scale macro-economic effects.

- The FP7 ex-ante impact assessment identified large-scale FP macro-economic effects:
  - €1 of Framework Programme funding leads to an increase in industry added value of between €7 and €14.
  - Member States' own evaluations also demonstrate the high impact of the FP: the FP's annual contribution to, for instance, UK industrial output exceeds £3 billion.

- On the basis of the NEMESIS econometric model, the long-term FP7 macro-economic impact was estimated at an extra 0.96 percent of GDP, an extra 1.57 percent of exports, and a reduction by 0.88 percent of imports

- The potential value added generated by eco-innovation pilot and market replication projects under CIP could be calculated in some € 3.4 million per million € invested (DG ENV, ref. Varma, 2007).

- Each € 1 of EU budget invested in the CIP venture capital facility has mobilised € 6.8 of other private or public funds (EC, 2011g).

THE FP PRODUCES LARGE SOCIAL IMPACTS

Studies show that EU funding produces large employment and other social impacts:

- See **Annex 5**: An extensive body of academic economics literature has demonstrated that R&D generates large employment effects.

- On the basis of the **NEMESIS** econometric model, the FP7 ex-ante impact assessment identified large-scale FP7 employment effects. The long-term employment impact of FP7 was estimated at 900,000 jobs, of which 300,000 in the field of research.

- **Survey** evidence supports the aforementioned modelling results on employment:
  - According to an EC-commissioned evaluation of the FP5 Growth programme, the number of jobs (expected to be) safeguarded amounted to 37,588 while the number of jobs (expected to be) created amounted to 8,038 (Ramboll Management and Matrix Knowledge Group, 2008).
  - According to a survey among FP5-7 project coordinators in the area of "Food, Agriculture and Fisheries, and Biotechnology" research, close to 5 percent of all projects resulted directly in the creation of a new company. 82 percent of all projects created jobs for the duration of the project and 35 percent of all projects created new jobs after the end of the project. 38 percent of all projects created at least one permanent S&T job.
  - According to a Dutch FP impact study (Technopolis), "the [FP's] impact on the human research capital in the Netherlands is considerable, with approximately 1200 researchers in the public sector alone funded by the FPs annually. For many research groups this is an important factor to guarantee the continuity of the group".
  - According to an Irish evaluation of FP6 (Forfas, 2009), 80 percent of participating organisations or research groups improved their ability to attract staff or increased employment (low impact: 27%, medium impact: 42%, high impact: 11%).
  - A Spanish evaluation of FP6 participation (Zabala Innovation Consulting SA (2010) found that, with regard to the creation of university posts, the FP performed better than national or regional programmes according to 38.89 percent of respondents and equally well according to 50 percent of respondents. With regard to the creation of public research organisation posts, the FP performed better than national or regional programmes according to 8.33 percent of respondents and equally well according to 75 percent of respondents.
  - A Swedish evaluation of the FP (VINNOVA, 2008) found that industrial FP participants' R&D activities and employment in the technology of the project tended to grow afterwards.
  - According to a Swiss evaluation of FP5 and FP6 (Interface Institut für Politikstudien and Fraunhofer-Institut für System- und Innovationsforschung, 2005), "rough estimates suggest that at least around 950 temporary and permanent positions are created as a direct result of the Framework Programme".
  - A Swiss evaluation of FP6 (State Secretariat for Education and Research, 2009) stated that "while certain significant benefits of Switzerland's participation in FPs are not measurable, there is no doubt that FPs have various impacts in social (welfare, security, equality, education, …), … employment … areas …, even if it is not known to what extent or in what way, precisely".
  - According to a UK evaluation of the FP (Technopolis, 2010), respondents reporting a positive benefit to cost ratio of FP participation pointed to the additional employment and training opportunities

created, particularly in relation to attracting and funding high quality scientists and motivated early-stage researchers.

- Through Marie Curie actions, the FP set a valuable bench-mark for the working conditions and employment standards of EU-researchers (Annerberg et al., 2010).
- The FP produces indirect social benefits through relevant natural sciences research:
  - According to a FP6-wide participation survey (IDEA Consult, 2009c), all thematic priorities contribute substantially to a better quality of life while life sciences, genomics and biotechnology for health, nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices, and food quality and safety contribute to better healthcare.
  - According to a Dutch FP impact study (Technopolis), "societal impact is demonstrated in domains with a strong societal mission such as health, sustainability and food safety".
- The FP also produces indirect social benefits through social sciences research on relevant issues:
  - An evaluation of FP5 and FP6 social and environmental effects (European Commission, 2005a) lists research on the following socially relevant issues:
    - Human rights (increasing equality of opportunity and entitlement, including among genders; ensuring that ethical issues are appropriately and effectively addressed; ensuring compatibility with the EU's Charter of Fundamental Rights)
    - Social cohesion (reducing social exclusion; reducing risks of poverty)
    - Economic cohesion (reducing disparities of income for particular sectors, groups of consumers, citizens, workers)
    - Employment (increasing employment opportunities (job creation, enterprise creation); increasing quality of employment and of the working environment)
    - Human capital formation (improving educational achievements in the population; increasing training and life-long learning opportunities; increasing skills and learning capability/flexibility, both within and outside the research community)
    - Public health and safety (improving the health of the population; reducing safety risks; improving nutrition, food quality and safety)
    - Social protection and social services (improving accessibility to health services; improving long-term sustainability of health services)
    - Liveable communities (improving quality of housing, infrastructures, services and the living environment in general)
    - Culture (preserving cultural diversity while increasing integration; preserving and exploiting cultural heritage)
    - Consumer interests (improving consumer information and choice; reducing consumers' risks)
    - Security (preventing crime and increasing protection against terrorism; improving the protection of networks and infrastructures; increasing the interoperability of integrated systems and services)
    - Governance (increasing participation and social capital formation (through increased accountability, democracy, citizens and stakeholders' empowerment, active citizenry)
    - International co-operation (promoting co-operation among Member States to reduce inequalities, achieve convergence and enhance social cohesion; promoting socio-economic conditions (e.g. welfare, quality of life, etc.) in non-EU countries)
    - Role of SMEs (increasing and enhancing the potential contribution of SMEs towards job creation, social cohesion, regional development, etc. (through the improvement of their technological capabilities and their increased involvement in research networks)).

THE FP PRODUCES LARGE ENVIRONMENTAL IMPACTS

The clearest environmental impacts are produced by FP-funded environmental research:

- According to an EC-commissioned evaluation of FP6 environmental research (EPEC, 2008), for instance, EU environmental research contributed to the knowledge base and development of methods and tools for environment related policy. The study found that:
  - At the international level, EU research related to climate change contributed to the International Panel on Climate Change (IPCC), either directly, through individual researchers involved in the IPCC review, or through references to EU-funded projects in IPCC reports.
  - In the domain of environment and health, there were strong links with EU policy priorities, most notably with the implementation of the Environment and Health Action Plan 2004-2010 as well as with the implementation of European Directives.
  - All natural hazards projects contributed to some extent to regional, national and European policies in the field of natural hazards, guidelines and standards.
  - Water and soil projects played a large role in the formulation and implementation of the Water Framework Directive.
  - Earth observation projects had direct impacts on policy-making through the use of their outcomes by stakeholders such as IPCC and WMO.
    - Environmental challenges are global and need to be tackled together with international partners at the European and global levels. Environmental research requires harmonised sets of data produced through satellite monitoring. The scale of the investment needed and the need for full European/international coverage and for open data access requires EU-level action. The FP7 environmental research priority allocated substantial resources to the development of a "Global Earth Observation System of Systems" (GEOSS) promoting the rapid expansion of full, open access to space and ground-based, water and airborne data and observations. GEOSS is maintained by the 85 member governments and the 61 participating organizations of the Global Earth Observation (GEO) on the basis of a 10-Year Implementation Plan (2005-2015). Inspired by the data-sharing principles developed by the Global Earth Observation (GEO) initiative, agencies involved in Earth Observation are making their data much more easily accessible, free of charge. The international character of GEOSS enables the participants to benefit from both know-how and data from other regions of the world. This represents a clear improvement of the general situation deplored by the EEA (2010) of limitation to the trans-national use of infrastructures funded at national levels. Funded projects under the Global Earth Observation initiative (FP7) play a key role in the development of GEOSS. FP7 examples include: EBONE aimed at building a biodiversity observation system, EUROGEOSS implementing a brokering service for accessing data, and IMPACTMIN aimed at developing monitoring impacts of mining operations using Earth Observations.

Yet other kinds of FP-funded research also produce clear environmental impacts:

- According to an evaluation of FP3 and FP4 Brite-Euram projects, for instance, just over one third of industrial participants reported that their project had had at least one environmental impact within their organisation, and the vast majority of these (97%) were positive: 39% cited savings in materials; 32% cited energy savings; and 32% cited reductions in the release of dangerous products.
- According to an EC-commissioned evaluation of the FP5 Growth programme (Deloitte, 2006) – which covered "Key Actions" like "Innovative products, processes and organisation", "Sustainable mobility and intermodality", "Land transport and marine technologies" and "New perspectives for aeronautics", and "Generic Activities" like "New materials and their production and transformation (including steel)" and "Measurement and testing" - the average environmental impact per project was substantial reaching 6.08 percent in terms of the expected reduction of waste and 4.06 percent in terms of the expected energy saving.
- According to an evaluation of a sub-set of FP5 Growth programme projects (Ramboll Management and Matrix Knowledge Group, 2008), nearly 25 percent of all evaluated projects anticipated medium-high or

high benefit with regard to the reduction or prevention of emissions, while about 20 percent anticipated medium-high or high benefit with regard to saving natural resources.

- According to an evaluation of FP5 and FP6 social and environmental impacts (European Commission, 2005a), important projects were, for instance, ExternE (Externalities of Energy) and ExternE-Transport, RECORDIT (Real Cost Reduction of Door-to-Door Intermodal Transport), and ECOSIT (External Costs of Industrial Technologies) that produced results that fed directly into policy formulation in the energy and transport sectors (e.g. the recent revision of the Eurovignette Directive). Similarly, the DYN-GEM-E3 project was instrumental in energy taxation reforms through "the macroeconomic evaluation of energy tax policies within the EU". The POLES model, also developed with EU energy research funding, was used to define the future CO2 emission baseline in the context of post-Kyoto targets".
- According to a FP6-wide participation survey (IDEA Consult, 2009c), the thematic priorities "Sustainable development, global change and ecosystems" and "Nanotechnologies and nanosciences etc." contributed to the sustainable use or production of energy, while the thematic priorities "Sustainable development, global change and ecosystems", "Nanotechnologies and nanosciences", "Aeronautics and space", and "Food quality and safety" contributed to the environment.

According to a survey conducted among FP5, FP6 and FP7 project coordinators in the area of "Food, Agriculture and Fisheries, and Biotechnology" research, 49 percent of all projects produced positive environmental impacts. 18 percent of all project coordinators stated that their project contributed to the reduction of greenhouse gas emissions, while 41 percent of all project coordinators stated that their project contributed to resource efficiency. Indirect environmental benefits were produced through FP research on how to improve the use of production inputs and increase resource use efficiency (e.g. water, which was targeted specifically in FP7); on how to reduce the reliance on pesticides and animal health products; on how to improve and make safer the use of animal waste to reduce environmental pollution; on GMO management strategies, models and containment systems, ensuring environment protection, food safety; on how to extend the use of renewable forest resources; on the long-term sustainability and productivity of forest ecosystems considering carbon sequestration, the water cycle, climate change; on how to reduce the loss of biodiversity in agriculture and forestry. National evaluations of the FP arrive at similar conclusions:

- According to an Irish evaluation of the FP (Forfas, 2009), 50 percent of all projects made a contribution to "improved environmental preservation or protection".
- A Swedish evaluation of the FP (VINNOVA, 2008) found that "Framework Programmes have positive effects on the behaviour of the research community, competitivity, jobs, regulation and the environment".
- According to a Swiss evaluation of the FP (State Secretariat for Education and Research, 2009), "no fewer than 70 projects from the FP5 environment programme were explicitly referred to in European Commission position papers. The EU Directive on greenhouse gas emission allowance trading was also based on findings from FPs". The evaluation also stated that "while certain significant benefits of Switzerland's participation in FPs are not measurable, there is no doubt that FPs have various impacts in … environmental (energy, pollution, natural disasters, …) … areas … , even if it is not known to what extent or in what way, precisely".
- According to respondents to a UK evaluation of the FP (Technopolis, 2010), FP activities strengthened previously weak UK capabilities in a number of environmentally relevant research areas ("The FP6 Marie Curie RTN has allowed us FINALLY to tackle an important research area (breeding of a novel fodder legume with tannins for animal nutrition, health and greenhouse gas emissions). An FP7 Marie Curie IEF is similarly enabling us to get involved in a willow breeding programme for the benefit of animals and the environment"). The FP5 STAIRRS and the FP6 SILENCE projects also directly informed the Environmental Noise Directive and railway TSI (Technical Specification for Interoperability) processes.

SUCCESS STORIES

- FP-funded collaborative research leads to technological breakthroughs. European engineers receiving collaborative research support were able in 2004 to develop the first chip in the world to go below the 45 nanometer limit. The momentum generated by the **NANOCMOS** and subsequent projects put EU industry in pole position opening the door to a wide range of innovations in products and services ranging

from communications to embedded electronics where Europe holds a large share of the global market (40% of total market worth more than 100 B€ per year).

- FP-funded collaborative research reduces risk and enables the achievement of pan-European standards. Standards and technologies developed by FP-funded researchers are today found in over 600 million 3G mobile phones, generating more than 250 billion euro of revenues every year to EU companies in products and services.
- FP-funded collaborative research facilitates the growth of innovative SMEs. In 2006, two small research-based companies from Sweden and Belgium, BioInvent and Thrombogenics, received together with academic and clinical partners a 1.9 million euro grant to form the project **ANGIOSTOP**. The firms have since developed an innovative form of treatment for cancer. In 2009, the companies secured a 50 million euro investment from global pharmaceutical giant Roche, with the possibility of increasing this amount to 450 million euro.
- EU funding leverages private investment. In the case of **RSFF**, the volume of loans is 12 times the EU contribution, and the additional leveraged investment in research, development and innovation is 30 times the EU contribution.
- As a result of targeted JRC research costing about 1 million euro, the cost of tests for BSE were reduced and the direct EC subsidy per test could be scaled back from 20 euro to 7 euro resulting in cumulative savings for the Community budget over the period 2002-2006 of about 250 million euro.
- JRC research enabled the launching of the GI2000 initiative and the 2007 INSPIRE directive establishing an infrastructure for spatial information in Europe. The estimated EU, national and regional investments for INSPIRE are of the order of 100 million euro whereas annual benefits of the full implementation of the directive are estimated at 8-12 billion euro.
- The aim of the **SLIC** project was to develop and commercialise a compact device ("lab-on-a-chip") for the extraction, identification and analysis of micro-RNAs, which affect gene regulation. Thanks to the international, collaborative framework of the European project, it was possible to recruit an interdisciplinary team with highly specialised skills, not all of which could be found in a single country. With the technology developed in the SLIC project, the time required for microRNA analysis has been reduced from a day to a quarter of an hour. This is associated with a considerable reduction in the costs of these procedures, which are now widely practised. This innovation entails significant benefits not only in economic terms (the Swiss start-up project coordinator, Ayanda Biosystems, has been approached by the leading companies in the sector), but also for science and health (more rapid and less costly diagnostics).
- Secure communication is an essential requirement for companies, public institutions and citizens. Encryption systems currently used are rendered vulnerable in particular by the continuing growth in computing power. Quantum cryptography, based on the quantum properties of light, ensures communication channels which are demonstrably inviolable. In 2008, the **SECOQC** project enabled the deployment of a telecommunication network based on quantum cryptography – a world first. No European group had expertise in all the technologies that were needed to establish a network of this kind. To succeed, the SECOQC project had to draw on the skills of 40 participants from 11 different countries. The demonstration of the feasibility of an inviolable communication network heralded the birth of a new market. The SECOQC project also led certain partners to jointly develop the first international standards in this new industry.
- The aim of the **CASOPT** project is to produce a paradigm change in the design of complex electromagnetically-driven industrial products. State-of-the-art simulation-based design is to be replaced by optimization-based design. This new approach is the key to achieving the goals of miniaturization, reductions in the quantity of materials required and costs, and improvements in the energy efficiency of products. The research consortium brings together partners from industry and academia in a project based on knowledge transfer. As the CASOPT project is highly multidisciplinary, it was necessary to assemble a team of world-class experts in numerical analysis, simulation, optimization, geometric design and parallel computing. The realization of this project essentially relies on existing site competencies and knowledge transfer among the partners, with support from additionally recruited experts. Synergies arise between the experience of private-sector and university institutions, and also between experienced

researchers and others who are younger and highly motivated. This offers them a unique opportunity to carry out research within a network, and also to develop other research ideas and projects. In the short term, the results of the project will be used in the design of power transmission and distribution systems. The CASOPT project will make it possible to push the performance of products beyond current limits without adversely affecting their reliability or robustness. In addition, highly skilled young students, PhD students or post-docs participating in this type of project can be recruited by industrial partners. In the long term, the project could have a decisive impact on the evolution of industrial design concepts for many different sectors, but also for SMEs, whose product range is also covered.

- FP collaborative research is often pioneering in its domain. The FP project on **Yeast genome** was the first international grant in genomics. Its aim was to reveal the first full set of genes of a eukaryotic genome and in a broader sense, identify basic biological mechanisms common to all living organisms, including man. This 7 years long research involved an international effort of 641 scientists in Europe, USA, Canada and Japan sequencing a total of 12.3 million of DNA base pairs covering the 16 nuclear chromosomes. Europe was not only at the origin of this large research venture, but also provided much of the sustained funding required to ensure the success of this pioneering task. A total of 92 European laboratories and over 400 European scientists have participated in this network. By the end of 2010, this project has generated more than 500 scientific articles reporting yeast DNA sequences and a total of 2,849 patents registered. With the discovery that the yeast genome is similar to that of man, very interesting prospects have opened up for the future understanding of certain diseases - such as cancers and genetic diseases.

- Oil is rapidly becoming scarcer and its use for transport purposes is responsible for a quarter of greenhouse gas emissions. It is important to develop clean and commercially viable alternatives to the combustion engine. Electric vehicles are widely seen as the most credible alternative to fossil fuel-based road transport. For Europe, it is of critical importance to develop an early technological and competitive lead in this rapidly developing market. Against this background, the objective of the European Green Cars Initiative is to support R&D on technologies and infrastructures that are essential for achieving breakthroughs in the use of renewable and non-polluting energy sources, safety and traffic fluidity. The **European Green Cars Initiative** is one of the three Public Private Partnerships (PPP) of the European Economic Recovery Plan announced by the President of the European Commission on the 26th of November 2008. Beyond providing loans through the European Investment Bank, the PPP European Green Cars Initiative is making available a total of one billion EUR for R&D through joint funding programmes of the European Commission, the industry and the Member States. These financial support measures will be supplemented by demand-side measures, involving regulatory action by Member States and the EU, such as the reduction of car registration taxes on low CO2 cars to stimulate car purchase by citizens. The reason for an initiative at EU-level is that a critical mass of combined expertise and effort is needed from all Member States and relevant industrial sectors to overcome the market and systemic failures associated with the introduction of new basic technologies. To avoid fragmentation reflected in research duplication and gaps, and to arrive at robust industry standards, a frequent exchange of information is needed between sectors and levels of government that do not normally interact on a regular basis. Investing in the production of equipment, components and electric systems is attractive only when everyone is on board. Since its launch merely two years ago, the European Green Cars Initiative has already brought closer the introduction of green vehicles on Europe's roads. The initiative instigated 51 research projects on technologies and standards needed to make electric vehicles feasible and commercially attractive. Advances have already been made in fields contributing to batteries that charge faster and have a longer driving range, and new vehicle models.

- The objective of the **NAD** project was to develop nanoparticles for Alzheimer's disease diagnosis and therapy. The rationale for the project was the fact that about 24 million people worldwide are affected by dementia and that the number of new cases per year reaches almost 5 million. In Europe, there are 5 million cases of dementia, 3 million of which are classified as Alzheimer's. NAD involved 19 partners from 13 different European countries. The critical mass needed to develop treatments of Alzheimer's disease is greater than what can be found at individual Member State level and it was thanks to the internationally collaborative nature of this EU funded research project that it was possible to bring together a comprehensive range of cutting edge European expertise from several multidisciplinary key areas: chemistry, physics, biochemistry, molecular biology, cell biology, pharmacology, biophysics,

computational biology, nanotechnology, neurology, anatomy and toxicology. If successful, NAD will produce nanoparticles able to cross the blood-brain barrier and reach the brain (site of the disease). Molecules able to selectively recognise (diagnosis) and destroy (therapy) toxic peptides characteristically accumulated in the brain of diseased patients will be identified and attached to the nanoparticles.

- The objective of the **EDCTP** (European and Developing Countries Clinical Trial Partnership) Article 185 initiative was to accelerate the development of new clinical interventions to fight HIV/AIDS, malaria and tuberculosis in developing countries. The background to the project was that worldwide over 30 million people are living with HIV and close to 3 million people become infected each year. In addition, there are each year close to 250 million cases of malaria worldwide (and close to 900,000 deaths) as well as 9 million cases of tuberculosis. EDCTP involves the European Commission, 16 European countries (14 Member States and 2 Associated Countries), industry, private charities like the Bill and Melinda Gates Foundations, and 29 Sub-Saharan African countries. The conceptualisation and implementation of this project required a level of coordination of a wide range of funding sources that could only be achieved at EU level. EDCTP has so far supported 54 clinical trials on new treatments and vaccines for HIV, malaria and tuberculosis and the training of 158 medical researchers. The US Food and Drug Administration has approved an anti-retroviral formulation for HIV infected children in Africa, which was tested through an EDCTP project. The first African Networks of Excellence for clinical trials in central Africa have been established and there are now national ethics committees in many African countries thanks to EDCTP.
- Pan-European Public Procurement On-line pilot project, funded by ICT-PSP, is creating a standards-based IT transport infrastructure which enables cross-boarder, interoperable public eProcurement with standardised electronic document formats. In results, it is easier for companies to bid for public sector contracts anywhere in the EU in a simpler and more efficient way. 12 Member States or associated countries are currently involved in the pilot.
- The innovative ICTs are used to help people receiving medical assistance anywhere in the EU. The ICT-PSP market demonstration project epSOS is building a service infrastructure demonstrating cross-border interoperability between electronic health record systems in Europe. The medical services are becoming more accessible throughout Europe thanks to removing linguistic, administrative and technical barriers. 23 Member States or associated countries are currently involved in this pilot project.

DETAILED EVIDENCE ON LESSONS LEARNED

While European research and innovation programmes have been successful, there are important lessons to be learned from the past, from stakeholder feedback, and from analytical studies. Research, innovation and education should be addressed in a more coordinated manner and coherent with other policies and research results better disseminated and valorised into new products, processes and services. The intervention logic of EU support programmes should be developed in a more focused, concrete, detailed and transparent manner. Programme access should be improved and start-up, SME, industrial, EU12 and extra-EU participation increased. Monitoring and evaluation need to be strengthened

The need for improved horizontal and vertical policy coordination

A number of FP ex-post evaluations have noted that the coordination between, on the one hand, the FP and other EU policies, and on the other hand, the FP and Member State research activities could be improved.

With regard to horizontal policy coordination in the narrow sense, the FP7 interim evaluation (Annerberg et al., 2010) noted that a strategic shift is needed to establish stronger and better connections between research, innovation and education (the so-called 'knowledge triangle'). As for broader horizontal policy coordination, the FP6 ex-post evaluation (Rietschel et al., 2009, 58-59) called for a clearer division of labour between the FP and the cohesion funds. It also stated that other EU policies such as transportation and energy would benefit from a more coordinated interface between FP research activities and regulatory and demand-side policies.

The need for horizontal policy coordination is confirmed by the conclusions of the OECD's work on the most appropriate system of innovation governance. OECD (2005a), for instance, mentions the need to develop "a strategic, horizontal approach", which "should include and develop the innovation policy potential in other ministerial domains and ensure a co-ordinated division of labour between them". And

OECD (2010b) concludes that "given the increasingly central role of innovation in delivering a wide range of economic and social objectives, a whole-of-government approach to policies for innovation is needed".

With regard to vertical policy coordination, the FP6 ex-post evaluation noted that, given its small size compared to Member State expenditure, the FP should not try to substitute for Member State R&D policies but should use its added value in a more strategic way and set an attractive and accepted European agenda. In the same vein, European research policy expert Erik Arnold (2009, 28) concluded that the division of labour between the EU and national levels should be further refined and more explicitly defined, in particular in view of the introduction of the likes of the European Research Council and the Joint Technology Initiatives.

The need for vertical policy coordination is confirmed by the results of OECD work on the optimal system of innovation governance. OECD (2010b), for instance, calls for "coherence and complementarities between the local, regional, national and international levels".

The need for focus and a more robust intervention logic

A number of FP ex-post evaluations (Rietschel et al., 2009, v; European Court of Auditors, 2007, paragraph IV) have noted that the programme's design could be improved. The view held is that the FP lacks a transparent, clear and robust intervention logic: the programme has too many objectives, and higher-level objectives are insufficiently translated into lower-level objectives.

With regard to the FP's objectives, the FP6 ex-post evaluation (Rietschel et al., 2009, vii) as well as expert evidence (Arnold, 2005, 29) noted that there were too many – addressing almost all S&T and socio-economic challenges - and that they were too abstract and vague and therefore untestable, complicating ex-post evaluation. A recent European Parliament ITRE Committee report (2011, paragraph 9) noted in the same vein that "an ever-growing number of objectives and themes covered and diversification of instruments has widened the scope of FP7 and reduced its capacity to serve a specific European objective".

In addition, no explicit links are made between higher-level objectives and lower-level concrete technical goals (European Commission, 2005b, 19; Arnold, 2009, 2). Meanwhile, instruments are not designed explicitly to achieve particular objectives: challenges are defined so as to match existing instruments, not the other way around (Stampfer, 2008, 13). The result is 'catch all' instruments trying to tackle all problems and to satisfy all types of stakeholders. That is why the European Court of Auditors has called for addressing a single objective through each instrument (European Court of Auditors, 2009, paragraph 57).

The importance of focus and a proper hierarchy of objectives (combined with appropriate monitoring) is confirmed by recent OECD work. OECD (2010b) for instance, argues in favour of "a more strategic focus on the role of policies for innovation in delivering stronger, cleaner and fairer growth". OECD (2005a) notes that "third-generation innovation policy cannot be properly implemented without precise targets and intelligent follow-up. Governments should increase their capacity to develop actions plans based on horizontal, strategic approaches and translate these into concrete measures to be taken by each ministry or agency. This will enhance vertical coherence, with monitoring and indicator systems ensuring sound reporting of empirical facts to the strategic apex".

The need to lower the barriers to participation

All FP ex-post evaluations - see, for instance, the chapters on participation in the FP6 ex-post (Rietschel et al., 2009) and FP7 interim (Annerberg et al., 2010) evaluations - are unanimous in their view that FP application, contract negotiation and project management procedures are too complex and burdensome and that this results in high barriers to FP application and participation, in general but in particular for first time, start-up, SMEs and EU12 applicants.

The need to increase the production, dissemination and valorisation of project outputs

Participants' main reasons for getting involved in the FP relate to networking and the creation of new knowledge (Arnold, 2009, 2). FP research is also more of a long-term, exploratory, technologically complex nature (Polt et al.). The FP should therefore not be expected to produce new, immediately commercialisable products and processes.

Nevertheless, FP evaluations conclude that more attention should be paid to the production of project outputs and to their dissemination and economic valorisation, in particular since the FP is supposed to support Europe's competitiveness. What is highlighted is the absence in the FP of valorisation channels that enable the exploitation of research results and the linking of knowledge created through the FP with socially beneficial uses (Rietschel et al., 2009, 26, 37; Annerberg et al., 2010, 62 and following). In the same vein, the FP7 interim evaluation observes a lack of clarity on how the FP incorporates innovation (as opposed to 'pure' research).

In this respect, OECD (2010b) argues that "the creation, diffusion and application of knowledge are essential to the ability of firms and countries to innovate and thrive in an increasingly competitive global economy".

The need to strengthen monitoring and evaluation

The main problem affecting the FP monitoring and evaluation system relates to the aforementioned lack of focused objectives and a robust intervention logic. The evaluation process aims to link evidence emerging from project implementation with the strategic and specific objectives set for the programme. As the European Court of Auditors (2007) observed, if this connection is difficult to make, an assessment exercise becomes extremely complicated. The FP evaluation and monitoring system suffers from other problems as well, however.

The importance of a proper monitoring and evaluation system is emphasized by the OECD. OECD (2005a), for instance, recommends "improving evaluation and learning": "In general, governments should create a solid basis for evaluation and learning and make them part of the policy-making process. This includes evaluation of broader reforms, as knowledge about their impact on innovation is useful for feedback and policy formulation. A more holistic approach to evaluation and learning can enhance feedback in the governance system and lead to more effective policy". OECD (2010b), on the other hand, argues that "evaluation is essential to enhance the effectiveness and efficiency of policies to foster innovation and deliver social welfare. Improved means of evaluation are needed to capture the broadening of innovation, along with better feedback of evaluation into the policy-making process. This also calls for improved measurement of innovation, including its outcomes and impacts".

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[1] Out of 34 European companies in the Top 100 R&D investing companies, 31 received FP funding under FP6. http://webarchive.nationalarchives.gov.uk/20101208170217/http://www.innovation.gov.uk/rd_scoreboard/downloads/2010_RD_Scoreboard_data.pdf

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COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

Annexes

Annex 2:The Need for Public Intervention and European Added Value

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ANNEX 2: THE NEED FOR PUBLIC INTERVENTION AND EUROPEAN ADDED VALUE

PUBLIC INTERVENTION IN RESEARCH AND INNOVATION IS JUSTIFIED BY MARKET AND SYSTEMIC FAILURES

- The right balance between public and private investment should be struck on the basis of a careful assessment of the presence of market and/or systemic failures that government should address.
- Research is seriously affected by **market failures**, as a result of which there is significant private sector underinvestment in research and a solid basis for public support:
  - A first market failure concerns **risk and uncertainty**. At the start of a research project, it is not at all sure that the research efforts undertaken will actually result in new knowledge and innovation. The challenge of risk and uncertainty is exacerbated by the fact that the cost of R&D is rising, because it becomes more expensive to carry out research and because the life-cycle of products is shortening dramatically (for more on costs of research, see Box hereafter). Levels of risk and uncertainty are especially high when developing the breakthrough technologies required by new techno-economic paradigms, in other words when engaging in radical rather than incremental innovation. A related point is that market prices do not take full account of negative externalities (e.g. polluting activities). As long as markets do not punish environmentally harmful impacts or reward environmental improvements, competition between environmental and non-environmental innovation is distorted and a socially sub-optimal amount of investment occurs.

Striking results of a recent EU survey on Cost of Research

A recent EU survey on "costs of research" has been conducted among 200 R&D intensive private companies and public research organisations equalling over 115,100 R&D employees (or 112,520 FTE) in Europe's ICT, pharmaceutical, chemical, and automotive sector. The results of the survey methodology have been cross-checked in 37 in-depth case-studies entailing over 50 personal interviews with R&D managers.

The surveyed companies unanimously judge R&D labour costs to be by far the largest cost component of undertaking R&D (50%), followed by capital costs (such as ICT, machines, infrastructures, 17%) and purchased R&D (14%). Although relocation intensities differ per sector, surveyed companies strikingly agree that relocating abroad is not an important action to reduce R&D costs; it is part of a bigger strategic decision to be closer to a particular market in order to adapt products to local demand and tap into local (R&D) expertise.

R&D labour costs is not only the largest cost component of R&D, it is also the cost factor most difficult to contain as it is governed by a global demand offering globally comparable wages. As one manager put it "one has to pay the salaries and one has to provide the infrastructure and equipment, otherwise it is impossible to attract excellent researchers in our industry", a trend most likely to continue in the future.

The activities considered by the surveyed companies to be most important in bringing down the cost of research, are:

- ✓ aligning R&D with business strategies,
- ✓ joining collaborative R&D projects, and
- ✓ technological efficiency of the R&D process.

The activities considered by the surveyed companies to be most influential in driving up the cost of research, are:

- ✓ complexity of the R&D process,
- ✓ environmental legislation, and
- ✓ regulation of product markets.

To the question whether the cost of research has increased in the past five years, surveyed firms reported an increase of 47% in R&D expenditures or total R&D costs over the last five years. Thereby, 87% of companies report that this growth is primarily based on an increase of the volume of R&D, while the 13% said that it is due to rising prices.

To the question whether the cost of research will continue to increase in the next 5 years, the companies reported to expect an increase of 30% on average. Given that the major cost component is R&D labour, costs of research in the longer term (20 years) are unlikely to fall in relative terms.

Source: COST, 2011

- Companies may be reluctant to invest in research out of fear that the new products they may come up with may make **obsolete** the products they are currently deriving substantial profits from. Such rigidity, such path dependency, prevents investment in radical innovations that can revolutionise markets and produce huge social benefits.

- Another market failure results from the fact that, even if the research initiative gives rise to new knowledge and innovation, it is not at all sure that the researcher or company that has undertaken the research efforts will be able to exclusively **appropriate** all the benefits deriving from it.
- The appropriation problem is exacerbated in the case of public goods and paradigm shifts.
  - Companies are reluctant to invest in research on **public goods**. Examples of public goods are clean air, clean drinking water, health, etc. The social benefits of research on public goods exceed the possible private gains to be derived from it, which leads to private underinvestment in research. A good example in this respect is the fact that private pharmaceutical companies carry out comparatively little research on the development of vaccines for diseases such as malaria, tuberculosis, and African strains of HIV. Another good example concerns eco-innovation, which produces positive externalities in the form of positive environmental effects for which the eco-innovator is not fully "rewarded".
  - Companies are also reluctant to invest in research for which as yet there is no immediate pay-off because no market exists yet or a market exists that is not yet fully developed. This is often the case for **paradigm-shifting** breakthrough technologies, e.g. environmental technologies, hydrogen, nuclear fusion, etc. In such cases, public support is essential not only to support research but also to "make" a market through public procurement, the provision of incentives to consumers, investment in accompanying infrastructure, etc.

- The need for public support of research also derives from the **system** nature of innovation, and from the importance to invest in human capital and networks to ensure the absorption of knowledge.
  - The innovation systems literature argues that what matters for an economy's innovation performance are the **linkages** and flows of information between the different actors in the innovation system. These linkages and flows are often sub-optimal and government can play a role in strengthening them.
  - As argued above, the dissemination, valorisation and economy-wide **market take-up** of new technologies is an issue of a systemic nature. For instance, electric cars will not be used on a large scale if electric vehicle refuelling points are not widely available. The public sector often has to take the lead in addressing such systemic obstacles to technology uptake. Another good example concerns eco-innovation, which does not concern a single sector in conventional terms but a range of technologies, products, services, business models, and potential target markets. This makes it more difficult for potential investors to evaluate funding opportunities and asses risks than if all investment opportunities were built around a common technology platform. This is especially the case in sub-sectors, such as those not related to energy, which are less known or considered immature and therefore riskier.

PUBLIC INTERVENTION IN RESEARCH AND INNOVATION PRODUCES CLEAR BENEFITS

Public research generates direct economic benefits

- It is a source of useful new information and knowledge (Martin et al., 1996, vii; CaSE, 2009).
- It creates new instrumentation and methodologies (Martin et al., 1996, vii).
- Those engaged in basic research develop skills which yield economic benefits when individuals move from basic research carrying codified and tacit knowledge (Martin et al., 1996, vii). Highly skilled scientists and engineers are one of the most predictable and rapid outputs of the research base and one that is highly prized by industry. They carry with them tacit knowledge - skills and experience - which in turn creates impacts in public or private research and is highly-valued in other sectors too (CaSE, 2009). Alongside new knowledge, universities working at the research frontier have a second core 'product', namely highly trained people, an essential resource for UK companies and foreign companies investing in the UK. Both outputs are essential for sustaining and improving the country’s economic performance (RCUK).
- Through participation in basic research, access is granted to networks of experts and information (Martin et al., 1996, vii).

- Those trained in basic research may be good at solving complex technological problems (Martin et al., 1996, vii).
- And, finally, on the basis of basic research, spin-off companies are created (Martin et al., 1996, vii). From 2003 to 2007, 31 university spin outs were floated on stock exchanges with an IPO value of £1.5 bn and 10 spin outs were bought for a total of £1.9 bn (CaSE, 2010). Universities also encourage innovation by smaller local businesses and, through incubators and science parks, the emergence of new companies (RCUK). University research has led to the development of many innovations that have been commercialised either through licensing to private companies or the formation of new start-up companies. This 'technology transfer' activity has been particularly intense in the United States since the Bayh-Dole Act in 1980. This piece of legislation not only gave universities the right to patent new discoveries but also mandated them to license inventions made with federally sponsored research to the private sector. Now, nearly all US research universities have a technology licensing office and explicit intellectual property policies and royalty-sharing arrangements for their scientists. Between 1991 and 2000, the number of licenses on university inventions in the United States increased from 1,278 to 4,362, and licensing income rose from $186 million to $1.3 billion. Licensing and star t-ups based on university innovations are increasing in Europe too, with the UK taking the lead (RCUK).

Public research increases the pay-off to private R&D and supports innovation

- US research estimates that a 10 per cent increase in university R&D increases corporate patenting by between 1 per cent and 4 per cent (Jaffe, 1989; Jaffe and Trajtenberg, 2002) (quoted in RCUK).
- 15 % of new products and 11 % of new processes would have been developed with a substantial delay in the absence of academic research (Mansfield, 1998).
- Approximately 20% of private sector innovations are partially based on public sector research (Tijssen, 2002).
- Cohen, Nelson and Walsh (2002) evaluated for the US manufacturing sector the influence of public (i.e. university and government R&D laboratory) research on industrial R&D, the role that public research plays in industrial R&D, and the pathways through which that effect is exercised. They found that public research is critical to industrial R&D in a small number of industries and importantly affects industrial R&D across much of the manufacturing sector. Public research both suggests new R&D projects and contributes to the completion of existing projects in roughly equal measure overall. Key channels through which university research impacts industrial R&D include published papers and reports, public conferences and meetings, informal information exchange, and consulting.
- A stochastic frontier analysis by the European Commission's Directorate-General Economic and Financial Affairs found significant positive effects on the number of patents and business patents per million inhabitants for a number of independent variables related to public intervention: the public R&D stock, international research cooperation and international researcher mobility (through which access is provided to the stock of foreign R&D), and the share of R&D invested in basic research (Mandl et al., 2008).

High-quality public research attracts private R&D

- Belderbos et al. (2009) found that, controlling for a wide range of host country factors, the number of relevant ISI publications by scientists based in the host country has a substantial positive impact on the propensity to conduct foreign R&D. The effect of academic research is significantly larger for firms with a stronger science orientation in R&D - as indicated by citations to scientific literature in prior patents;
- Doh et al. (sd) found that US MNC R&D location decisions, and the relative levels of R&D investment in a given country location, are mostly influenced by broad, macroeconomic and development factors. Scientific output, and to a lesser extent, institutional quality, appropriability regimes, and telecommunications infrastructure, also influence R&D location, while the presence of existing MNC investment is not found to influence R&D investment.
- Dosi, Llerena and Sylos Labini (2009) presented cross-country comparisons revealing that industry-financed R&D is positively associated with both the per capita number of highly cited researchers and expenditure on higher education R&D. This also held within sectors: in a number of industrial sectors,

R&D intensity was positively correlated with the quality of academic research in selected related fields, and those countries with the highest per capita number of highly cited scientists in relevant fields displayed the highest R&D intensities.

- Guimon (2008) found that the empirical evidence available suggests that, among the factors related to the host country, the main location drivers for R&D-intensive foreign direct investment are the availability of world-class research infrastructure and skilled labour as well as the dynamism of the national innovation system, that is, the degree of interaction and collaboration among different firms and other "knowledge producing and diffusing organizations" (universities and research centres, consultants, industrial associations, etc.).

- Abramovsky, Harrison and Simpson (2007) (quoted in RCUK) investigated the relationship between the location of private sector R&D labs and university research departments in Great Britain. They combined establishment-level data on R&D activity with information on levels and changes in research quality. The strongest evidence for co-location was found for pharmaceuticals R&D but also for other sectors evidence for co-location was found. There is evidence that private sector R&D labs in the UK are disproportionately clustered around highly rated university research departments. This phenomenon is not driven just by university 'spin-outs': in some industries, foreign-owned companies are choosing to locate in close proximity to high quality research. This implies that multinational companies may be sourcing cutting-edge technologies from universities in the UK. The results of this study show that R&D facilities 'cluster' near university departments, particularly in the pharmaceuticals and chemicals sectors. A postcode area (for example, ‘OX’ for Oxford) with a chemistry department rated 5 or 5* by the 2001 RAE is likely to have around twice as many labs doing R&D in pharmaceuticals and around three times as many foreign-owned pharmaceuticals R&D labs compared with a postcode area with no 5 or 5* rated chemistry departments.

- Research also finds evidence that foreign-owned labs in the machinery and aerospace sectors are likely to be located near to materials science and electrical engineering departments rated 4 or below by the RAE (Abramovsky and Simpson, 2008) (quoted in RCUK). This suggests that companies also benefit from proximity to more applied, commercially oriented research activity.

- A recent study analyses the relationship between the number of patenting manufacturing firms and the quantity and quality of relevant university research across UK postcode areas (Helmers and Rogers, 2010) (quoted in RCUK). It finds that different measures of research 'power' and 'quality' positively affect the patenting of small firms within the same postcode area. This indicates that small firms benefit from localised university-industry knowledge transfer.

- A further study of research and local development examines the impact of university business incubators on innovation by firms close by (Helmers, 2010) (quoted in RCUK). Standard business incubators provide start-up companies with a range of support measures, including physical space within the incubator building, training and coaching, business contacts, access to finance, etc. University incubators have the additional advantage that they can draw on the resources available at the university, including academic support, access to research facilities, as well as easy access to the student pool to recruit employees. The study finds that the recent wave of establishment of new university business incubators in the UK has generated local externalities by increasing the patenting propensity of incumbent firms located geographically close to the new university business incubators. Incumbent firms react to the entry of new firms within the same sector by increasing their propensity to patent by 2-6 per cent. The effect is stronger the closer the entrant is geographically located to an incumbent – the strongest impact occurs within a radius of 5-15 kilometres. Beyond 100 kilometres, entry has no economically significant effect on incumbent patenting.

- Recent research on knowledge spillovers from university innovation in the United States confirms that, for companies to use publicly funded research most effectively, geographical location has a significant contribution (Belenzon and Schankerman, 2010) (quoted in RCUK). Analysing patent citations both to university patents and scientific publications, the study finds that knowledge spillovers are strongly localised, sensitive to distances of up to 15 miles. Companies located in the same state as the cited university are substantially more likely to cite one of the university patents than a company located outside the state.

Public subsidies for private research increase the total amount of research expenditure (input additionality, crowding-in effect, leverage effect)

- Most recent studies find positive effects of R&D subsidies on R&D investment (Czarnitzki, 2011).
- €1 of public funding for R&D (including defence) leads to additional business R&D of €0.70-0.93 when allocated to business (Guellec and Van Pottelsberghe, 2000; European Commission, 2004).
- A 10 per cent increase in university research increases private R&D by 7 per cent (Jaffe, 1989; Jaffe and Trajtenberg, 2002) (quoted in RCUK).
- A 1% increase in public basic pharmaceutical research leads to a 1.7% increase in industry R&D after eight years. And a 1% increase in public clinical research leads to a 0.4% increase in industry R&D after three years (Toole, 2007) (quoted in CaSE, 2010).
- This additional research expenditure does not just translate into higher researcher wages; it generates additional research (Aerts, 2008; Lokhsin and Mohnen, 2008).

The crowding-in or leverage effect of public subsidies for private research is larger in the case of more productive collaborative research

- The crowding-in/leverage effect of public funding is larger for industry-science collaborative research than for pure industrial research (Czarnitzki, 2011).
- Industry-science collaborative research projects produce larger spill-over effects than pure industrial research projects (Czarnitzki, 2011).

Public subsidies for private research increase the total amount of innovation (output additionality)

- Subsidized private R&D leads to more innovation output. It has a positive impact on patents and new product sales (Czarnitzki, 2011).

THE ADDED VALUE OF EU-LEVEL SUPPORT FOR RESEARCH AND INNOVATION IS UNDISPUTED

All FP ex-post evaluations agree that EU level support in the field of research and innovation is marked by European added value. Thanks to EU initiatives in fields like frontier research (ERC), research infrastructures (ESFRI), the coordination of research funding (JTIs, joint programming), and research training and career development (Marie Curie Actions), the European R&D landscape is radically changing for the better. In addition, the EU supports actions like cross-border collaborative research, cross-border research mobility and cross-border access to research infrastructures that are most efficiently organised at EU level, that are of strategic importance, and for which no alternatives exist

The literature is unanimous

The European added value of EU intervention in the field of research and innovation is undisputed:

- The FP7 interim evaluation (Annerberg et al., 2010) concluded that "FP7 is assessed to fill in important gaps between national research activities, thus gaining critical mass in many areas and ensuring added value, as the assessments suggest that the FP7 activities are not likely to have been implemented without EU level funding".
- The FP6 ex-post evaluation (Rietschel et al., 2009) concluded that "the activities under FP6 … generated European added value" and that "FP6 was a powerful mechanism for catalysing RTD in Europe that could only be realised through action at the European level", and "[could] find no evidence that plausible alternative approaches would have been more successful in the same timeframe, acknowledging the ambition, scale and importance of FP6".
- The Five-Year Assessment 1999-2003 (European Commission, 2005) concluded that all evidence seen by it "whether at Community or Member State level, consistently emphasised the significant additionality and European added value for the Framework Programmes".

- European S&T expert Erik Arnold (2009) states the widely held consensus view that "[FP] projects were mostly 'additional' in the sense that they would not have been conducted without European funding", that "their role was therefore quite distinct from nationally funded projects", and that "FP6 provided opportunities for extended international and cross-sectoral networking, for projects of a greater scale (particularly financial scale), and for projects of a greater technical and scientific complexity – opportunities which would have been severely limited without the funds it made available".

Thanks to EU initiatives, the European R&D landscape is radically changing for the better

- **The EU created the European Research Council, which promotes excellence across Europe:**
  - The European Research Council would not have been created without an EU initiative. The EU would then have been left with a landscape of compartmentalized national research councils, but would have had no funding mechanism to promote EU-wide competition for funds and to encourage higher scientific quality in frontier research.
- **The EU leads in the creation and use of research infrastructures of pan-European importance:**
  - Thanks to EU leadership, for the first time, a pan-European strategy on research infrastructures (the so-called ESFRI roadmap) has been developed and is now being implemented. No less than 10 next generation European infrastructures [e.g. IAGOS (In-service Aircraft for a Global Observing System), ESS (European Spallation Source) and SHARE (Survey of Health, Ageing and Retirement in Europe)] are currently being built by groups of Member States and these facilities would not have seen the light of day if it were not for EU action. In addition, without EU funding measures to facilitate access to unique and expensive infrastructures, 9 out of 10 researchers say that they would not have been able to access vital research facilities, which is a often a precondition for successful frontier research. For example:
    - The IA-SFS project has created the largest network of free electron lasers and synchrotrons in the world, serving several thousand European scientists and allowing a wide range of applications.
    - The European Grid Infrastructure gives European researchers access to the aggregated processing power of 200 000 computers in the world's largest distributed computing infrastructure ever built, with over 290 sites in more than 50 countries, utilised by 13 000 researchers.
- **The EU makes it easier for private companies to develop and implement joint strategic research agendas, which help to boost their competitiveness and stimulate smart, sustainable and inclusive growth:**
  - An important achievement of the Framework Programme has been to establish instruments and mechanisms (e.g. European Technology Platforms, Joint Technology Initiatives) that facilitate the joint development and implementation of strategic research agendas by the private sector and for public-private partnership. These strategic research agendas have played a key role in boosting the competitiveness of the sectors involved. For example:
    - The Innovative Medicines Initiative is helping to make Europe the most attractive place for pharmaceutical R&D, thereby enhancing access to innovative medicines for patients. It does so by providing new tools and methodologies to remove major bottlenecks in drug development.
    - The Clean Sky joint technology initiative is bringing significant step changes regarding the environmental impact of aviation. Clean Sky will speed up technological breakthroughs and shorten the time to market for new and cleaner solutions tested on full scale demonstrators. It will thus contribute significantly to reducing the environmental footprint of aviation (i.e. emissions and noise reduction but also green life cycle) for future generations.
- **The EU helps bring together compartmentalized national research funding across borders so as to achieve the scale needed to tackle important societal challenges:**
  - One of the pioneering achievements of the Framework Programme has been to establish instruments and mechanisms (e.g. ERA-NET, Article 185) for the joint programming of Member State research. This has led to a new approach to research funding involving countries pooling and coordinating their own national funds across borders. For example:

- A pilot Joint Programming action has brought together 23 Member States and associated countries to jointly develop and fund a strategic research agenda for tackling neurodegenerative diseases and Alzheimer's.
- EURAMET is an action aimed at coordinating metrology research across Europe. Involving 22 National Metrology Institutes it pools 44% of overall metrology resources in one initiative, reducing duplication of research and encouraging the more efficient use of resources.

The EU most efficiently organises cross-border research and mobility actions that are of systemic and strategic importance and for which no alternatives exist

- **EU cross-border research, innovation and mobility actions are of systemic importance:**
  - **Cross-border collaborative research and innovation collaboration actions** are of key importance since they underpin the 'open innovation' paradigm:
    - It enables the achievement of the **critical mass** required for breakthroughs when research activities are of such a scale and complexity that no single Member State can provide the necessary financial or personnel resources, so when, for instance, a large research capacity is needed and resources must be pooled to be effective or when there is a strong requirement for complementary or comparative knowledge and skills (e.g. in highly inter-disciplinary fields). Telling examples are rare diseases research, space research, ICT, etc. For example, when researching rare diseases the FP helps to bring together the necessary critical mass of patients, expertise, and facilities. There are at least 6000 to 7000 rare diseases, which taken together affect some 20 million European citizens. However, research at national level is often hampered by a thin distribution of patients, few specialised research groups, and a lack of standardisation of available data and material collections.
    - It enables research addressing **pan-European policy challenges**. Public policy challenges have become increasingly international (e.g. environment, health, food safety, climate change, security) and their resolution has become increasingly dependent upon the establishment of a common scientific base. Moreover, research can lead to the establishment of harmonized laws and standards. Given the shared interest and the scale on which these issues arise, such research activities are best organised in a cross-border collaborative manner.
    - It reduces risk and enables the achievement of **pan-European standards**. Working in trans-national consortia helps firms to lower research risks, thus enabling certain research to take place. Involving key EU industry players helps reduce commercial risks, by ensuring that research results and solutions are applicable across Europe and beyond, enabling the development of EU- and world-wide standards and interoperable solutions, and offering the potential for exploitation in a market of 500 million people. The FP supports the kind of pan-European research collaboration required to speedily produce industrial standards that can set the tone and be adopted at the global level. ICT research & innovation, for instance, is increasingly organised around new kinds of collaboration involving common, open technology platforms with high spill-over and leverage effects. They allow a much wider range of stakeholders to profit from new developments and further innovate. Federating and partnering at EU level helps ensure that research results and solutions are applicable across Europe and beyond. It enables consensus building, interoperable solutions and the development of EU- and world-wide standards. EU research also provides an important umbrella to facilitate globally interoperable ICT systems, global consensus and standards. Direct EU level actions also support pre-normative research in support of standardisation, harmonization and development of reference materials and methods. Without the FP, Europe would not have been at the origin of the global standard for 2G and 3G mobile communications.
    - It enables the rapid and wide **dissemination** of research results – to users, industries, firms (SMEs in particular), citizens, etc. – leading to a better exploitation of research, and giving a larger impact than would be possible only at Member State level.
    - **Growing innovative SMEs**: Innovative SMEs, for instance in the field of ICT and services, play a vital role in generating new ideas and transforming these into business assets. They are agile, able to focus their research and innovation efforts and take fast technical and business decisions. SME involvement in research and innovation at EU level improves their partnerships and alliances with other companies and research labs across Europe. It enables innovative SMEs to develop new

products and services beyond their in-house and national capabilities. And, it allows them to grow and enter new international markets.

- **Leveraging private investment**: Through EU research schemes such as collaborative research, Joint Technology Initiatives (ARTEMIS, Clean Sky, ENIAC, FCH, IMI), and Joint Programming initiatives (e.g. EDCTP, AAL, Eurostars, EMRP), private companies can collaborate with foreign partners at a scale not possible at national level, in projects tested for excellence and potential market impact, which induces them to invest more of their own funds than they would under national funding schemes. In the field of key enabling technologies (KETs), for instance, a common European strategy with coordination mechanisms creates synergies and economies of scale that lead to improved industrial exploitation of KETs in the EU.

- **Marie Curie cross-border and cross-sector researcher mobility and training actions** are of key importance as they can increase the quantity and quality of the EU's research knowledge base by attracting young people into research, attracting top researchers to come to Europe and ensuring excellent training to the coming generations of European researchers; have a pronounced structuring effect on the European Research Area by setting standards for innovative research training, promoting attractive career development for researchers from all nationalities at all levels of their career, setting standards of attractive employment conditions and open recruitments for all EU-researchers, spreading good practices of the European Researchers Charter and Code of Conduct for the Recruitment of Researchers, and leveraging additional financing and aligning national resources through the co-funding mechanism of fellowship programmes; strengthen innovation by exposing researchers to an industrial environment at an early stage of their career, promoting long-term cooperation between academia and industry, and ensuring participation of a broad spectrum of small and large enterprises in the training and career development of researchers.

- **Cross-border innovation support actions** – comprising innovation 'policy intelligence' (gathering and processing analytical data for better policy making in innovation cannot be achieved without the EU dimension and the cross-country comparisons) and innovation 'policy learning' (important added-value comes from bringing together knowledge and experience from different contexts, supporting cross-country comparisons of innovation policy tools and experiences and the opportunity to identify, promote and test best practice from over the widest possible area) - contributes to better policies and tools for supporting businesses in bringing innovation to the market. The ICT PSP component of CIP has been able to bring Member States together to test deployment of innovative ICT applications at real scale. These actions aim at stimulating demand and facilitating formation of markets in areas with high untapped potential such as cross-border e-health services. Cross-border innovation support actions also comprise EU level venture capital support. High-tech start-ups require venture capital. Venture capital markets can only function well at European scale, however, and improvement requires European action. It is only possible at European level to achieve the necessary scale and the strong participation of private investors that are the hallmarks of a self-sustaining venture capital market. Many successful companies such as Skype, WaveLight AG, Fimasys, etc. would not exist today without the funding and guidance provided during their early stages by venture capitalists supported by the CIP-EIP. Specialised innovation support, access to venture capital or benchmarking innovation management performance against competitors would be best provided through an 'internal market for innovation support'.

- **EU cross-border research, innovation and mobility actions are of strategic importance to participants:**

  - A study on ICT under FP4 and FP5 (Databank Consulting et al., 2004) found that FP collaborative research funded mainly two types of R&D projects: (1) "Core" projects: highly interesting, necessary and strategically important projects that occur in the core technology areas of the respondents (58 percent of projects); (2) "Complex-risky" projects: long-term, technically complex, and risky from commercial and technical point of view (26 percent of projects)40 % of industry participants in FP6-IST reported their research in the ICT programmes being of high to very high commercial risk.

  - A study on Marie Curie actions under FP4 and FP5 (Van de Sande et al., 2005) found that participating in such actions was perceived as having an important impact (score of up to 90 percent) on issues central to career development like the development of research skills, the accumulation of international experience, the development of transnational research networks, etc.

- An Austrian study on FP4 (Joanneum Research et al., 2001) found that most FP projects were seen as of strategic importance: 37.7% of EU projects were seen as of central importance and 53.7% of EU projects supported other innovation activities. FP projects were closer to the scientific-technological core concentration of the company, more involved, and more application-oriented than nationally funded projects and against this backdrop, FP projects gained a specific strategic significance for companies.
- A Danish study on FP4 (Danish Institute for Studies in Research and Research Policy, 2000) found that more than 90% of participants participated in projects with a research content close to the core of the workplace. Close to 75% of participants indicated that the projects were part of the long-term strategic R&D.
- A Finnish study on FP4 (Luukkonen and Hälikkä, 2000) found that most FP projects were either of strategic/central importance or of potential future importance/supporting other research activities. For big companies, for instance, the shares were over 20 percent and over 55 percent respectively, while for SMEs, the shares were 40 percent and over 40 percent respectively.
- An Irish study on FP4 (Forfas, 2001) found that, generally speaking, the projects undertaken by Irish participants were complex, exciting, long-term projects in core technologies which most organisations considered of strategic importance and high relevance to their organisations.
- A survey covering the whole of FP5 (ATLANTIS Research Organisation et al., 2004) found that most FP5 projects were seen as strategically important projects in core technology areas for the organisations concerned. Typically they were tightly linked either conceptually or more pragmatically with other in-house projects but were only feasible when undertaken in collaboration with others. Projects were generally of a high scientific and technical complexity and skewed towards the longer-term end of the spectrum. Work of an applied R&D nature nevertheless still predominated over more basic research, especially for industrial participants.
- A Finnish study on FP5 (Uotila et al., 2004) found that FP-funded projects were either of high current or of future strategic importance. For big companies, for instance, the shares exceed 20 percent and 55 percent respectively, while for SMEs, the shares exceeded 20 percent and 65 percent respectively.
- A Norwegian study on FP5 (NIFU, STEP and Technopolis, 2004) found that EU-funding seemed to stimulate businesses to get involved in more risky research than otherwise, which could widen their technological horizons and opportunities.
- The Innovation Impact study on FP5 and FP6 (Polt et al., 2008) found that, compared to collaborative research projects funded exclusively via internal R&D budgets, FP projects were, on average, characterised by lower commercial risk, longer term R&D horizon, more interest in 'peripheral' technologies outside the core technologies of participants, and a focus on exploration (rather than exploitation) strategies.
- A survey covering the whole of FP6 (IDEA Consult, 2009) found that "FP funded projects are incomparable with national/regional funded projects, as their objectives and characteristics are very different" (p24) and that "the average research project funded under FP6 [concerns] long-term, strategically highly important, technically highly complex R&D in a core technological area of the organisation. … It is tightly linked with other in-house projects but mainly considered only feasible with external collaborators" (p20).
- A German study on FP6 (Federal Ministry of Education and Research, 2009) found that large, export-oriented companies as well as companies in the field of cutting-edge technology and the knowledge-intensive service sector were more likely to take part in FP6 than in federal or Länder programmes. They concluded that the European and international focus of the FPs was particularly attractive for companies in sunrise sectors.

- **Without the EU programmes, most of these strategically important research and innovation actions would simply not take place or be far less ambitious**
  - Interview-based evidence indicates that in the absence of CIP funding, eco-innovation projects would not have benefited from cross-border cooperation and learning and the resulting EU-wide market scope. Most beneficiaries indicated that they would not have moved forward with the development of the

technology or, had they done so, it would have been at a much smaller scale focusing on the needs and characteristics of the national or regional markets.

- As Table 1 below shows, the FP achieves very high levels of overall "project additionality": without FP funding, the great majority of FP projects would not have been carried out at all (hypothetical case). This is a first key finding that is highly robust: it is a finding valid across a series of FPs and across a range of different actions; it is a finding resulting from Commission-commissioned evaluation studies as well as nationally commissioned evaluation studies; and it is a finding confirmed through control groups: the great majority of rejected FP proposals never got implemented (experimental case).
- A second key finding is that the levels of overall "project additionality" achieved by the FP are much higher than those achieved by most European and non-European national R&D funding schemes (Compare Tables 1 and 2). It seems that there are far fewer substitutes for EU funding than there are for national schemes.
- A third key finding is that the FP achieves very high levels of "behavioural additionality": the great majority of those projects that would have been carried out in the absence of EU funding would have changed dramatically, undermining their strategic importance: they would have been carried out on a smaller scale (with less money, with fewer partners), with a reduced scope (less ambitious), and at a later stage or over a longer period of time.
- A fourth key finding is that the levels of "behavioural additionality" achieved by the FP are much higher than those achieved by most European and non-European national R&D schemes.
- A fifth key finding is that the FP achieves very high levels of "project" and "behavioural" additionality not only overall but also and particularly for strategic projects. This is once more a finding that is highly robust: it is a finding valid across a series of FPs; it is a finding resulting from Commission-commissioned evaluation studies as well as nationally commissioned evaluation studies; and it is a finding confirmed through control groups:
  - A study on ICT under FP4 and FP5 found high levels of project additionality for the FP overall (Table 1) as well as for strategically important projects (below) (Databank Consulting et al., 2004).

		Additionality	
		Project possible only with EU funding	Project potentially able to find other funding
All projects	High strategic imp	55%	19%
	Low strategic imp	18%	7%
Core projects	High strategic imp	61%	22%
	Low strategic imp	9%	1%
Complex-risky projects	High strategic imp	45%	12%
	Low strategic imp	20%	10%

  - A Finnish study on FP4 (Luukkonen, T. and S. Hälikkä, 2000), found high levels of additionality for the FP overall (Table 1) as well as for strategic projects (below).

			Additionality		
			High	Low	None
Firms	Strategic value	Of central importance	42	53	5
		Of potential future importance	49	49	2
		Of marginal importance	49	49	2
Non-firms	Strategic value	Of central importance	45	49	6
		Of potential future importance	58	39	3
		Of marginal importance	67	30	3

- A survey covering the whole of FP5 (ATLANTIS Research Organisation et al., 2004) found high levels of additionality for the FP overall (Table 1) as well as for strategic projects (below).

			High	Low	None
	Pure Additionality	Behavioural Additionality	No Additionality	Negative Additionality	Total
High Strategic Importance	38.7%	30.6%	3.8%	0.9%	74.0%
Moderate Strategic Importance	13.6%	4.6%	1.1%	0.1%	19.4%
Low Strategic Importance	4.9%	1.3%	0.3%	0.1%	6.6%
Total	57.2%	36.5%	5.2%	1.1%	100.0%

- A survey covering the whole of FP6 (IDEA Consult, 2009) found high levels of additionality for the FP overall (Table 1) as well as for strategic projects (below).

	Low to very low strategic importance	Medium strategic importance	High to very high strategic importance	Weighted average
	FP5 additionality and strategic importance			
No additionality	14%	5%	5.5%	6%
Behavioural add.	14%	25%	42.5%	37%
Pure additionality	72%	70%	52%	57%
Total	7%	20%	73%	100%
	FP6 additionality and strategic importance (experimental group)			
No additionality	0%	4%	5%	4%
Behavioural add.	27%	37%	42%	39%
Pure additionality	73%	59%	53%	57%
Total	11%	27%	62%	100%
	FP6 additionality and strategic importance (control group)			
No additionality	7%	4%	7%	6%
Behavioural add.	21%	29%	38%	33%
Pure additionality	72%	68%	55%	61%
Total	14%	28%	58%	100%

- According to a survey among participants in FP5/FP6 ICT projects (WING, 2009), the evolution from FP5 to FP6 saw larger enterprises and SMEs shifting their focus towards longer-term research of high strategic importance in what they considered their core R&D area. This trend continued into FP7 and saw further increases in the strategic importance of FP7 ICT research for all stakeholder groups, whereby 70% of all surveyed participants deemed the programme of high to very high strategic importance for their own organisation (Technopolis, 2010c).

Table 1: Evaluations of the FP

FP	Study owner – Scope of the Evaluation	**Full** Project Additionality (Share of respondents who **did** (failed applicants) or **would** (participants) abandon the project in the absence of FP funding	**Partial** Project Additionality (Share of respondents who **did** (failed applicants) or **would** (participants) change the nature of the project in the absence of EU funding) (*: share of total respondents; **: share of respondents who **did** (failed applicants) or **would** (participants) not abandon the project)				Reference
			Scale additionality (Share of respondents who **did** (failed applicants) or **would** (participants) reduce the scale of the project in the absence of FP funding)	**Acceleration** additionality (Share of respondents who **did** (failed applicants) or **would** (participants) postpone or increase the duration of the project in the absence of FP funding)	**Scope** additionality (Share of respondents who **did** (failed applicants) or **would** (participants) reduce the scope or objectives of the project in the absence of FP funding)	**Networking** Additionality (Share of respondents who **did** (failed applicants) or **would** (participants) reduce the number of (international) partners in the absence of FP funding)	
FP3&4	EC – BriteEuram	• 45% large companies would • 51% SMEs would	• 44% large companies would* • 22% SMEs would*		90% would*		European Commission (2002)
FP4&5	EC – IST	• 73% would					Databank Consulting et al. (2004)
FP4&5	EC – Marie Curie	• 69% would (Cat 20)[1] • 53% would (Cat 30) • 70% would (Cat 40)					Van de Sande et al. (2005)
FP4	National – Austria	70.1% would	86% would**				Joanneum Research et al. (2001)
			40% would**		52% would**	40% would**	
FP4	National – Denmark	70% would	60% would*	50% would*			Danish Institute for Studies in Research and Research Policy

[1] Sum of answers "important" and "very important, I would not have gone abroad otherwise" for question on importance of Marie Curie for stimulating mobility.

							(2000)
FP4	National – Finland	54% would	22% would*	19% would*	17% would*		Luukkonen and Hälikkä (2000)
FP4	National – Ireland	82% would	>70% would**	Almost 40% would**	Almost 80% would**	Almost 40% would**	Forfas (2001)
FP4&5	National – UK	70% would	17% would*				DTI - Office of Science and Technology (2004)
				59% would**	90% would**	64% would**	
FP5	EC – All	• 57% would • 84% did	• 36%would* • 16% did*				ATLANTIS Research Organisation et al. (2004)
			• 76% would** • >40% did**	• 33% would** • >50% did**	• 43% would** • 6% did**	• 70% would** • 43% did**	
FP5	EC – Growth	69.6% would				20.9% would*	Matrix Insight Ltd. (2008)
FP5&6	EC – SME	55% would		45% would*	45% would*		European Commission (2007)
FP5	EC – Research Infrastructure Access	88% would					European Commission (2003)
FP5	National – Finland	70% would	40% would*	36% would*	14% would*		Uotila et al. (2004)
FP5	National – Norway	Almost 95% would	>90% would*	>80% would*	47% would**	<80% would**	NIFU, STEP and Technopolis (2004)
FP5&6	National – Switzerland	• 75% would • 70% did					Interface Institut für Politikstudien and Fraunhofer-Institut für System- und Innovationsforschung (ISI) (2005)
FP6	EC – All	• 66% did • 57% would	29% did* 38% would*				IDEA Consult (2009)
			76% did** 83% would**	60%/57% (start/duration) did** 44%/46% (start/duration) would**	71% did** 78% would**	69% did** 80% would**	
FP6	EC -All	• 59% did (control group I) • 63% did (control group II) • 57% would	• 35% did (control group I)* • 33% did (control group II)* • 39% would*				IDEA Consult (2009)
FP6	National – Finland	80% would	53% would*	39% would*	40% would*		TEKES (2008)
FP6	National – Ireland	56% did					Forfas (2009)
FP6	National – Spain	74% would	23% would*				Zabala Innovation Consulting SA (2010)

Table 2: Evaluations of national R&D support schemes

Study owner – Scope of the Evaluation	**Full Project Additionality (Share of respondents who did (failed applicants) or would (participants) abandon the project in the absence of national funding**	**Partial Project Additionality (Share of respondents who did (failed applicants) or would (participants) change the nature of the project in the absence of EU funding) (*: share of total respondents; **: share of respondents who did (failed applicants) or would (participants) not abandon the project)**				**Reference**
		Scale additionality (Share of respondents who did (failed applicants) or would (participants) reduce the scale of the project in the absence of national funding)	**Acceleration additionality (Share of respondents who did (failed applicants) or would (participants) postpone or increase the duration of the project in the absence of national funding)**	**Scope additionality (Share of respondents who did (failed applicants) or would (participants) reduce the scope or objectives of the project in the absence of national funding)**	**Networking Additionality (Share of respondents who did (failed applicants) or would (participants) reduce the number of (international) partners in the absence of national funding)**	
Austria - FFF	• 28% would • 31% did	• 57% would* • 47% did*				Falk (2004); Joanneum Research, WIFO and KOF (2004); OECD (2006)
		• 74% would** • 60% did**	Postpone: • 32% would** • 43% did** Lengthen: • 51% would** • 61% did**	• 49% would** • 40% did**		
Flanders - IWT	29% would	46% would*				Georghiou et al. (2004); OECD (2006)
Flanders - IWT	• 41% would • 43% did	• 48% would* • 25% did*				Steurs et al. (2006)
Australia – R&D Start Programme	37% would	90% would**	100% would**		59% would**	OECD (2006)
Finland – TEKES funding	20% would	46% would*		>60% pursued R&D not connected to the short-term needs of business operations >70% realised riskier and more profitable research		OECD (2006)
Norway – Innovation Norway funding	53% would	16% would have reduced scale or postponed*				OECD (2006)

US - ATP	93% would			82% of projects more ambitious than other R&D projects 70% of projects more technically difficult than other R&D projects		OECD (2006)

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Annexes

Annex 3: EU S&T Performance and Investment - Part A

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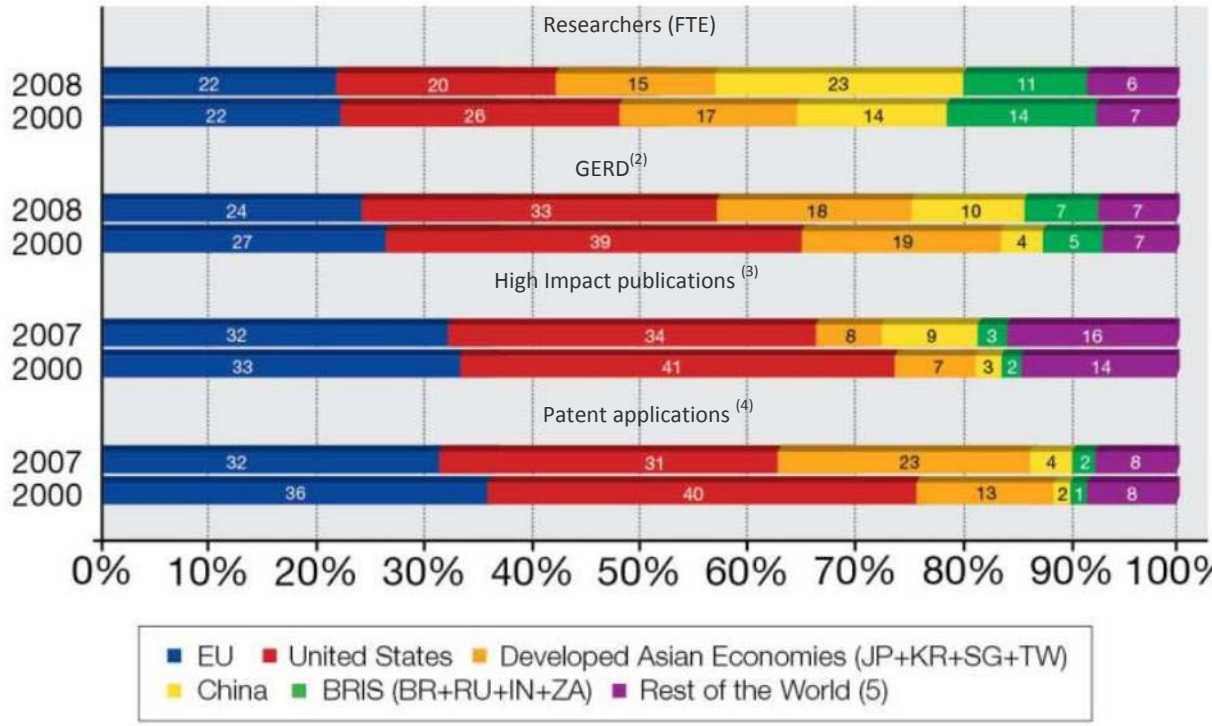
ANNEX 3: EU S&T PERFORMANCE AND INVESTMENT

The global S&T landscape is changing

The last decade has already seen a shifting centre of gravity of scientific and economic activity towards Asia. If one takes the 5 Asian countries (China, Japan, Korea, Singapore and Taiwan) for the latest year:

- 38% of researchers worldwide came from these countries in 2008 compared with 30% in 2000; over the same period the EU's share fell from 22.4% to 21.7%;
- These countries represented 29% of global R&D in 2008 compared with 22% in 2000; over the same period the EU's share fell from 27% to 24%;
- The Asian-5 accounted for 15% of all high impact scientific publications in 2007, up from 10% in 2000; over the same period the EU's share dropped from 33.2% to 32.4%;
- They applied for 28% of all (PCT) patents in 2007, twice the share they had in 2000; the EU meanwhile saw its share decline from 36% to 32%.

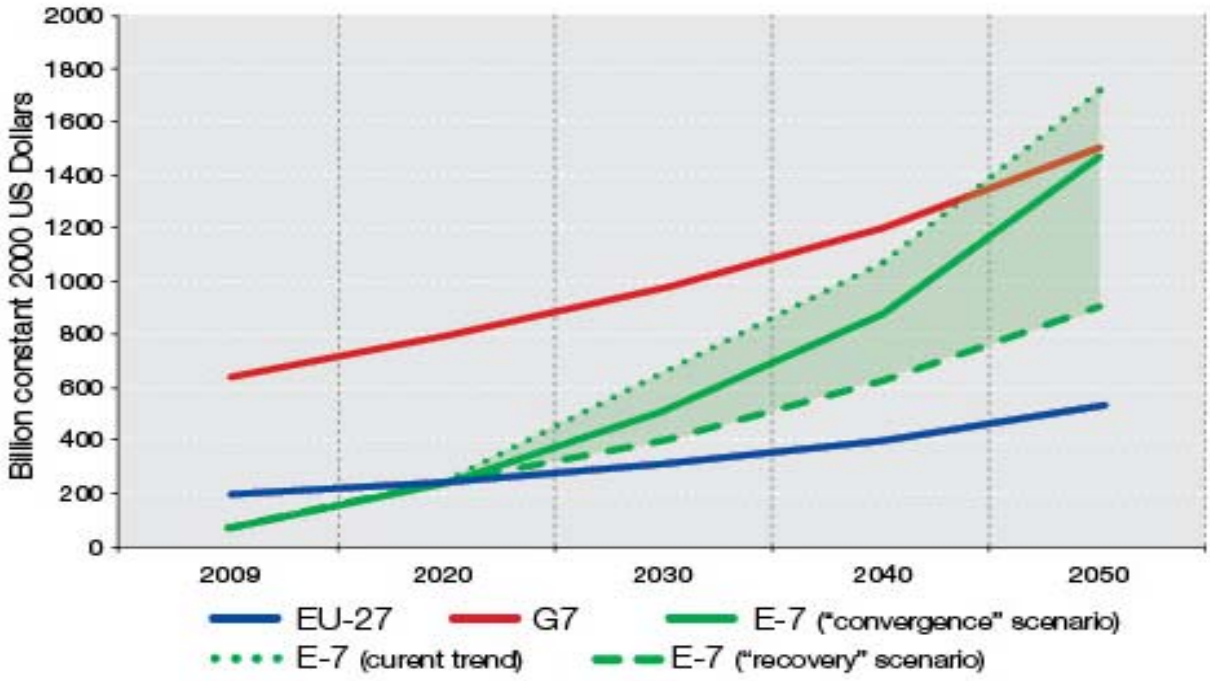
Figure 1: Participation in global R&D - % shares



Source: DG Research and Innovation
Data: Eurostat, OECD, UNESCO, Science Metrix/ Scopus (Elsevier)
Notes: (1) Elements of estimation were involved in the compilation of the data
(2) GERD: shares were calculated from values in current PPS€.
(3) (i) Top10% most cited publications – fractional counting method; (ii) ASIAN-5 does not include Singapore and Taiwan.
(4) Patent applications under the PCT (Patent Cooperation Treaty) at international phase, designating the European Patent Office
(5) The coverage of the Rest of the World is not uniform for all indicators.

If current trends continue over the next three decades, the emerging economies could be as important economically and scientifically as the advanced economies. Under conservative assumptions for growth and for R&D spending[1], the emerging economies could be investing the same volume of R&D as the G7 countries by 2050 (see Figure 2), and by 2020, they could already be investing more than the EU. This expansion of R&D spending by the emerging countries should inevitably lead to their producing more patents in the coming decades. As seen in Figure 3, whereas the G7 currently account for 85% of PCT patent applications compared with only 8% for the E7 countries, by 2050 the G7 share could have diminished to 50%, with the E7 countries at nearly the same level (46%).

Figure 2: Long-term trends in R&D spending



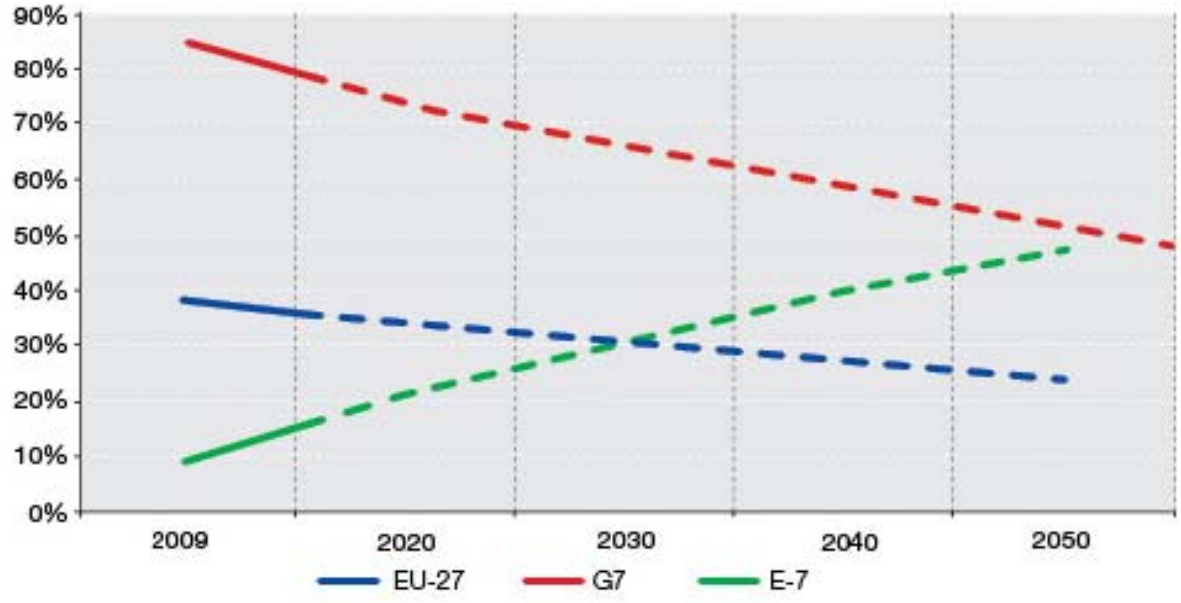
Source: *DG Research and Innovation*

Data: *HSBC estimates of GDP growth, OECD, World Bank*

Note: *i) "G7" is the group of seven industrialized nations: Canada, France, Germany, Italy, Japan, UK and the US; "E7" is a group of rapidly emerging economies: Brazil, China, India, Indonesia, Mexico, Russia and Turkey*

ii) The 3 scenarios are as follows (1) In the "current trend" scenario, the projections are entirely based on the trend observed during the period 1996-2007. The maximum R&D intensity for each country is limited at 5%. (2) The "convergence" scenario assumes that R&D expenditures for all countries will continue along the current trend, but for E7 countries once an R&D intensity of 3% is reached the annual R&D intensity growth for that country is limited to 1%. (3) The "Recovery" scenario assumes that G7 countries will - by 2020 - spend at least 3% of GDP into research (political commitment) and will continue to increase their investments. After 2020, it is assumed that the annual growth rate of R&D intensity in G7 will be the average annual growth rate during the period 1990-2020.

Figure 3: Long-term trends in world shares of PCT patents



***Source*:** *DG Research and Innovation*

Data: *OECD patent database*

Note: The graph is based on the assumption that R&D spending in the E7 and the G7 will evolve in line with the "convergence scenario" in Figure 2. It assumes a gradually increasing propensity to patent (patent/business R&D ratio) for the E7 countries, and a stable propensity for the G7. Data are for patent applications filed under the PCT, at international phase, designating the European Patent Office (the PCT is a system facilitating the worldwide filing of patent applications).

Europe needs research and innovation to recover from the economic crisis, and to boost growth and jobs, but the context for investment is difficult

In this competitive global setting, Europe needs to set itself on a path towards a strong recovery from the economic crisis. But this will not be easy. Following the crisis R&D investment has slowed. For the EU as a whole, the decrease in nominal R&D expenditure was about 3 billion euro (-1.32%, from 239.7 billion in 2008 euro to 236.8 billion euro in 2009).

The total government R&D budget for EU-27 increased in 2009 (to 88.6 billion euros, from 86.2 in 2008[2]). In the medium term, the need for fiscal consolidation may place further pressure on the ability of some European governments to maintain their investment in R&D. Business investment in R&D was more affected than public investment in 2009. In EU's business sector, R&D expenditure decreased by -3.07% that year in nominal terms.

The EU is still lagging behind in terms of the percentage of its GDP invested in R&D. In 2008 EU R&D intensity was 1.92, compared with 2.77 for the US and 3.44 for Japan. The 2009 figure shows an increase (2.01), but this is largely due to falling GDP.

Private R&D in Europe has largely stagnated at around 1.2% of GDP over the last decade, whereas business R&D intensity grew rapidly in Japan (from 2.2% to 2.7%) and South Korea (from 1.7% to 2.5%) over the same period, and more than doubled in China (from 0.5% to 1.1%).

While many fast growing firms are born as SMEs, their R&D intensity is lower in Europe (0.25 in 2007) than it is for the US (0.30) and South Korea (0.56). This lack of investment is in turn reflected in the smaller role played by "young leading innovators" or Yollies – R&D intensive firms which rapidly grow into world leaders due to substantial R&D efforts[3].

And Europe's competitiveness and innovative performance are weak

In Europe total factor productivity stagnated in the last decade compared with around 7% increase since 2000 in the US and Japan[4]. Various studies have pointed to the need to improve the productivity of service sector by increasing R&D in services[5].

While analyses show that growth in trade in manufacturing is largely driven by high technology industries[6], the EU's performance in high technology is far from strong. The share of high-tech and medium-high-tech products in EU exports is lower than that of its main trading partners - 47% in 2008, compared with 60% for the US, 71% for South Korea, and 75% for Japan[7]. Taking a broader view, the overall innovation performance gap has broadened with the US and Japan, while emerging countries are catching up[8].

One of the weaknesses of Europe's innovation system is the poor links between public and private research actors, which lower its capacity to maximise the use of local knowledge. The EU produces only 36 scientific co-publications per million population which involve public-private collaboration, whereas the US produces 70 and Japan 56[9].

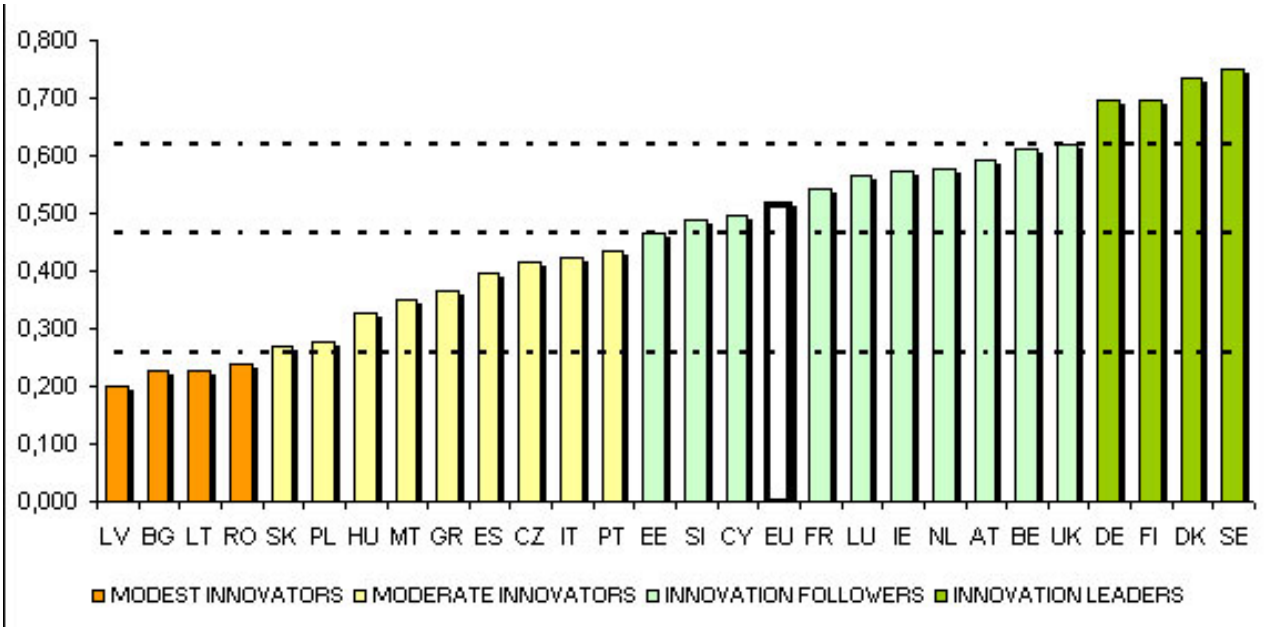
These weak science-industry links, combined with Europe's underinvestment in private R&D have an impact upon its capacity to introduce technological innovation. In 2007, the EU produced 4 PCT patent applications[10] per billion euro of GDP, slightly below the United States and much lower than Japan and South Korea, which produced 8 and 7 respectively. In 2009, the economic revenues obtained from the licensing of these patents, which in part relates to their quality and usefulness, amounted to 0.2% of the total GDP in Europe[11]. In contrast, these revenues were more than double and triple in Japan and the United States. Moreover, this gap has widened considerably during the past decade.

Globally, the EU is failing to close the innovation performance gap with its main international competitors: the US and Japan. Although the trends in most EU Member States are promising despite the economic crisis, progress is not fast enough. While the EU still maintains a clear lead over the emerging economies of India and Russia, Brazil is making steady progress, and China is catching up rapidly. Within the EU, Sweden is the most impressive performer followed by Denmark, Finland and Germany. The UK, Belgium,

Austria, Ireland, Luxembourg, France, Cyprus, Slovenia and Estonia, in that order, form the next group (Figure 4).

All the innovation leaders have higher than average public-private co-publications per million of population, which points to good linkages between the science base and businesses. All Europe's most innovative countries also excel in the commercialisation of their technological knowledge, as measured by their performance in terms of license and patent revenues from abroad.

Figure 4: EU Member States' innovation performance



Source: *DG Enterprise and DG Research and Innovation, Innovation Union Scoreboard 2010*

Note: *Average performance is measured using a composite indicator building on data for 24 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. Average performance in 2010 reflects performance in 2008/2009 due to a lag in data availability. The performance of Innovation leaders is 20% or more above that of the EU27; of Innovation followers it is less than 20% above but more than 10% below that of the EU27; of Moderate innovators it is less than 10% below but more than 50% below that of the EU27; and for Modest innovators it is below 50% that of the EU27*

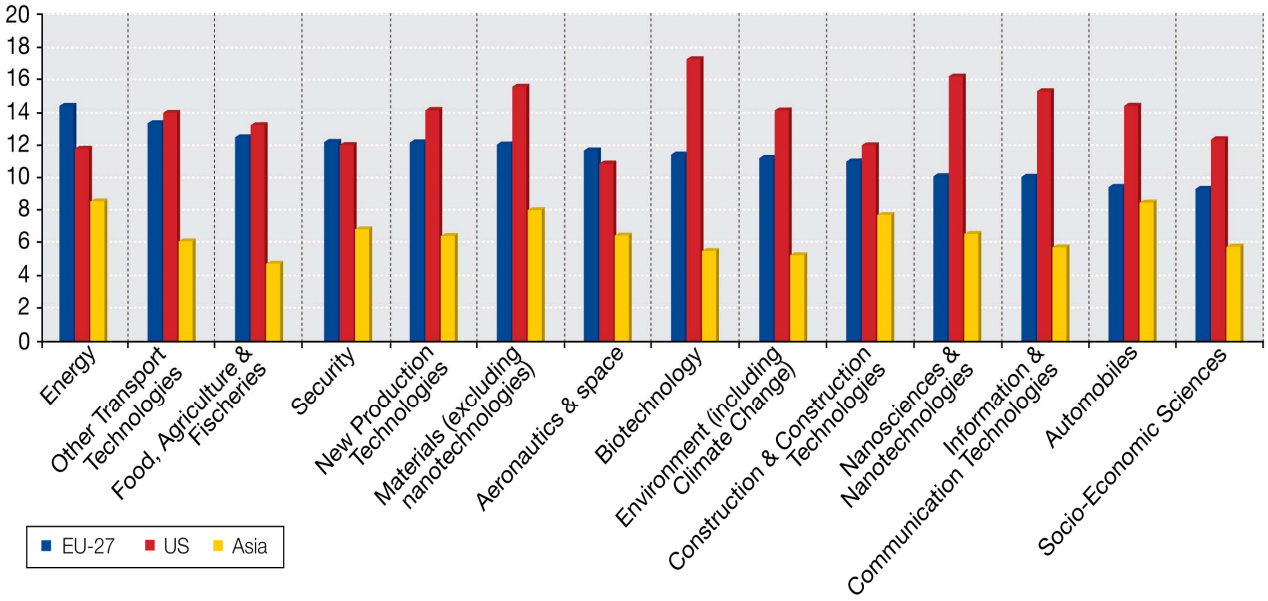
Europe also needs to raise scientific quality

While 15% of US scientific publications are among the top 10% most cited publications worldwide, only 11% of EU publications fall into this category. Meanwhile, China had 7% of its publications in the top ranking in 2007, compared with just under 5% in 2000[12].

When it comes to academic institutions, of the 386 most active research universities in the world 45% are in Europe and 32% in the US[13]. But only eight of the 76 universities in the world with the highest citation impact are located in the EU. 67 are located in the US.

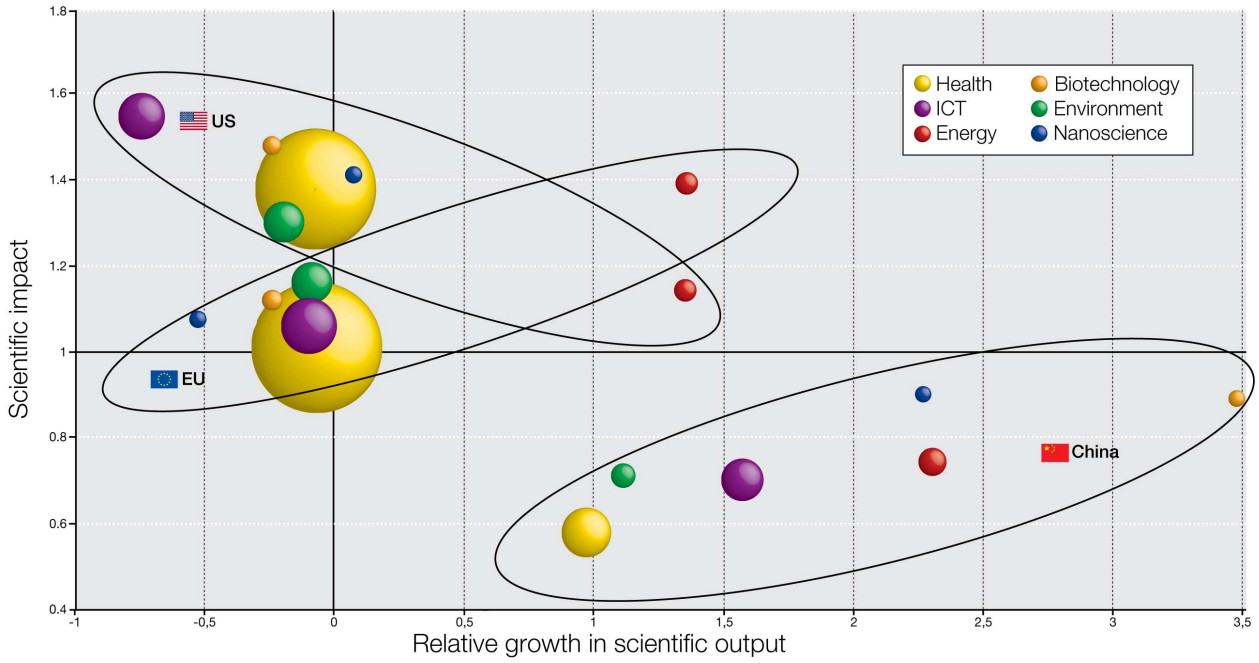
This pattern of the EU falling behind in terms of quality is continued if one looks across different fields. Figure 5 shows a number of S&T areas that relate to the fields of the EU Framework Programme. It can be seen that in almost all areas the US has significantly more publications in the top 10% most cited than does the EU.

Figure 5: Percentage of scientific publications in the top 10% most cited (2000-2009)



Source: DG Research and Innovation
Data: Science Matrix/ Scopus (Elsevier)

Figure 6: Scientific performance in key fields



Source: DG Research and Innovation

Data: *Science Metrix / Scopus (Elsevier)*
Notes: *Scientific impact = Average of relative citations computed for 2000-2006 publications (with sliding citation time window [N;N+3]) A value above 1 means a country is cited more often than the world average.*
Relative growth in scientific output 2005-2009 compared with 2000-2004. Expressed as the absolute difference in percentage points between growth of country X and the world average growth of publications in the field
Size of bubble is proportional to the volume of publications.

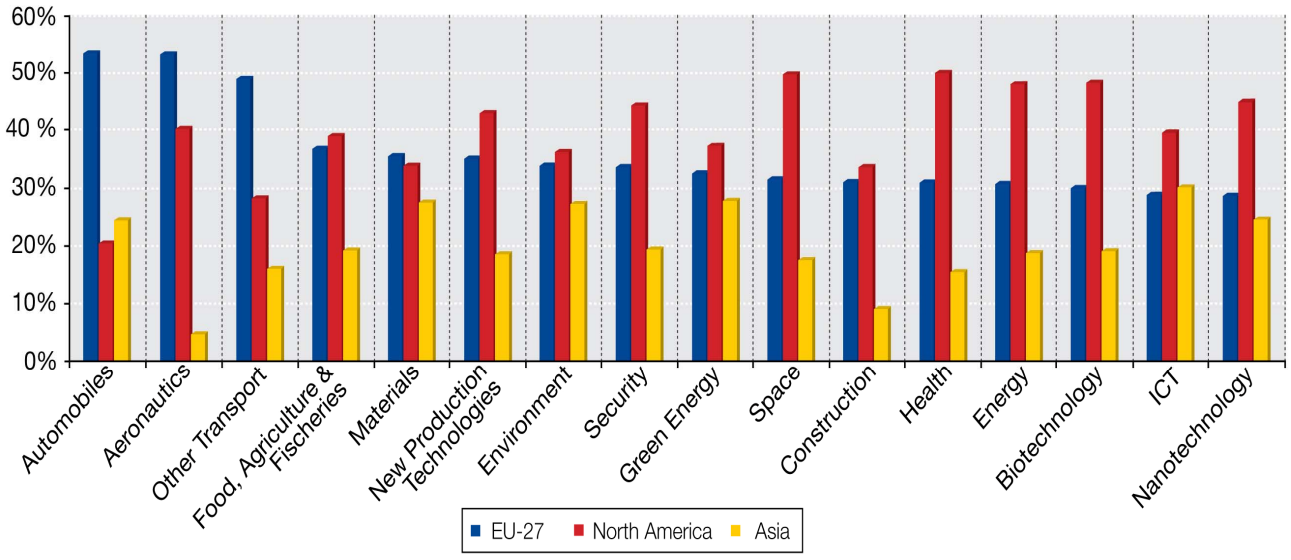
If one looks at scientific impact in key fields in relation to the growth in scientific output in these fields (Figure 6), two trends emerge clearly. Firstly, in the areas of health, environment, nanoscience, biotechnology and ICT Europe's impact falls behind that of the US (albeit that in the environment field its publication output is growing slightly faster). Secondly, while China is still behind the EU and the US in these fields in terms of scientific impact and in terms of publication volume, its output is growing at a much faster rate.

And gain a technological lead over its competitors

When it comes to the development of new technologies, Europe needs to rise to the challenge of global competition. It is relatively strong in certain more traditional fields such as automobiles, aeronautics, other transport and construction, where it must seek to maintain its large share of global patents (see Figure 7). However, in a number of technology areas Europe is behind its competitors. This is certainly true for some key enabling technologies: for example in nanotechnology the EU has
28% of world patents compared with 45% for the US and 24% for Asia; in biotechnology it has 30% versus 48% for the US and 19% for Asia; while in ICT the EU has 29% of global patents, the US 40% and Asia 30%. The EU also lags in terms of patents in key areas for the future, notably health, energy, space and security.

If one takes a combined look at Europe's relative performance in both science and technology across various fields (Figure 8), one sees that it is ahead of the US in terms of both science and technology output in the field of aeronautics and space. However, Europe is weaker than the US in the fields of nanotechnology, biotechnology and ICT, as well as in health and new production technologies.

Figure 7: Patent shares 2000-2009 (PCT applications)



Source: DG Research and Innovation

Data: EPO PATSTAT database (from a study by Research Division INCENTIM, MSI, Faculty of Business & Economics, K.U.Leuven, Università Commerciale Luigi Bocconi, KITES)

[1] These estimates are based upon GDP growth forecasts made by HSBC (*The World in 2050 – Quantifying the Shift in the Global Economy*, HSBC, 4 January 2011). They assume that G7 R&D spending evolves based on the trend observed during the period 1996-2007. For E7, they assume that R&D expenditure evolves according to the 1996-2007 trend until a country reaches an R&D intensity of 3%, and then after this the annual R&D intensity growth for that country is limited at 1%.

[2] Source Eurostat: Government Budget Appropriations or Outlays on R&D

[3] Bruegel Policy Brief, August 2010, R.Veugelers and M.Cincera.

[4] DG ECFIN 2010

[5] For example, the report of the CREST OMC 3% Working Group on "Promoting the role of R&D in services" 2009.

[6] "Science, Technology and Industry Scoreboard", OECD 2009 (p.86)

[7] *European Innovation Scoreboard*, 2010

[8] *European Innovation Scoreboard*, 2010

[9] *European Innovation Scoreboard* 2010. Data for 2008.

[10] Patent applications under the Patent Cooperation Treaty, at international phase, designating the EPO by country of residence of the inventor. Source OECD.

[11] Source Eurostat.

[12] Source: Science Metrix, Scopus (Elsevier)

[13] According to the latest edition of the Shanghai Ranking,

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Annex 3: EU S&T Performance and Investment - Part B

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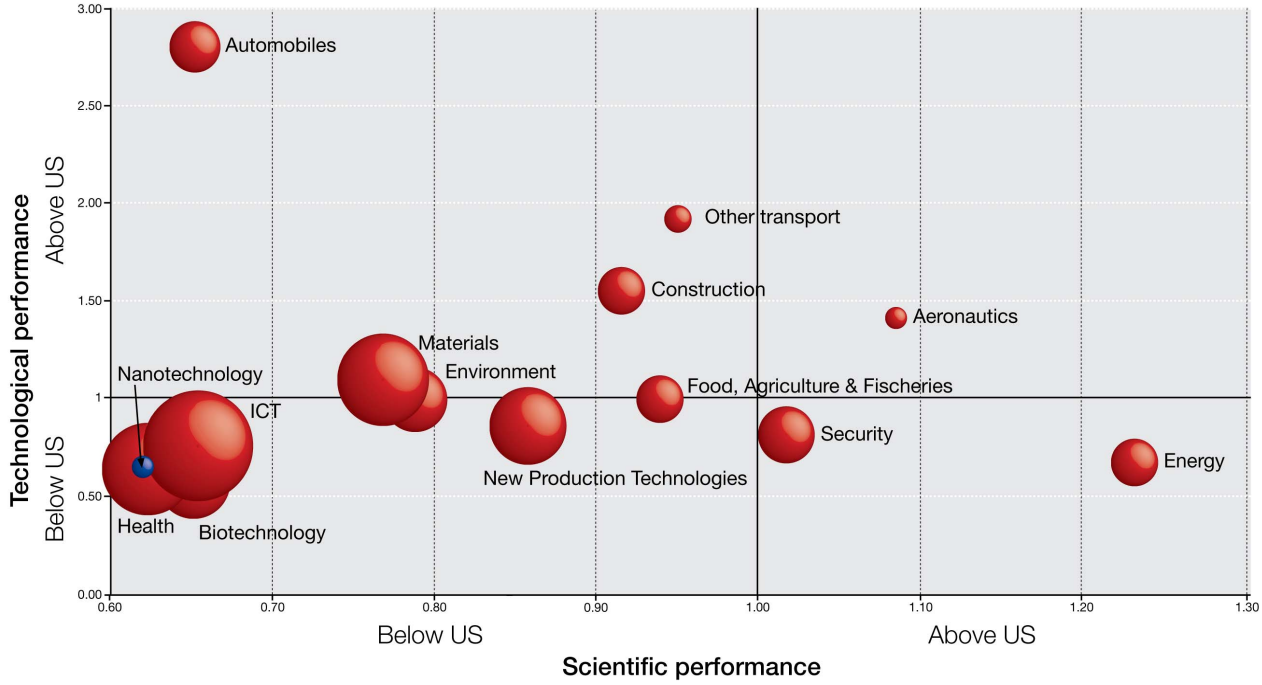
{SEC(2011) 1428 final}

Figure 8: European S&T performance relative to the US



Source: DG Research and Innovation
Data: PCT patents - EPO PATSTAT database (from a study by Research Division INCENTIM, MSI, Faculty of Business & Economics, K.U.Leuven, Università Commerciale Luigi Bocconi, KITES)
Scientific publications - Science Metrix / Scopus (Elsevier)
Notes:
1) Scientific performance is measured in terms of the % of publications in the top 10% most cited category (2000-2006 publications with sliding citation window [N, N+3]). On the X axis the percentage for the EU is divided by that for the US.
(2) Technological performance is measured by the share of global PCT patents for the period 2000-2009 (Patents filed under the Patent Co-operation Treaty (PCT), at international phase, that designate the EPO). On the Y axis the share for the EU is divided by that for the US.
(3) The size of the bubbles = number of EU-27 patents in the technology field

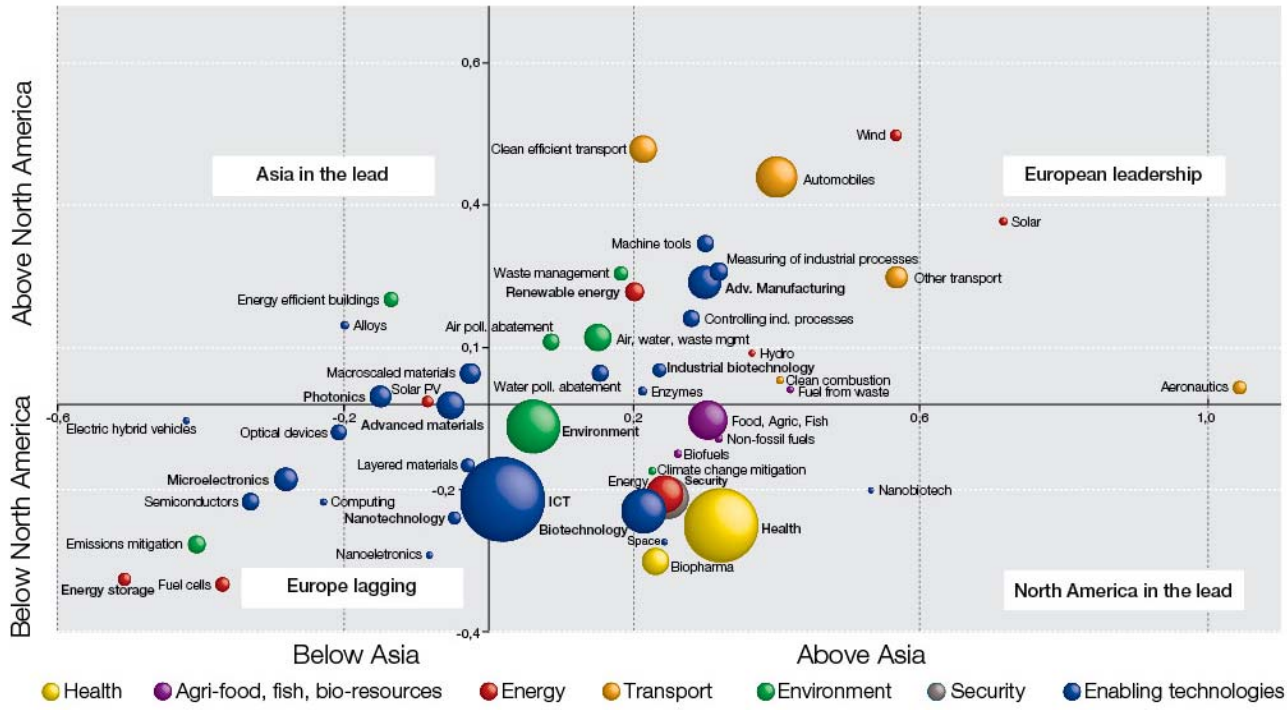
While better harnessing its research and innovation to tackle societal challenges

The EU faces serious challenges across a number of key areas, including health, energy and the environment. However, when it comes to science and innovation, Europe's performance in these areas is mixed. For example:

- The EU devotes considerable resources to environmental sciences (in 2008 it invested 5 euros per capita, compared with just 2 for the US and Japan)[1]. It also leads the field in patenting related to air and water pollution control, solid and waste management and renewable energies. For these fields combined it has 35% of all patents, compared with 22% for the US and 20% for Japan[2].
- In health related research the US is the world leader. In terms of public budgets, the US devoted more than 0.2% of GDP to such research, while the EU invested 0.05%[3]. Companies in the US invest almost the twice as much in health R&D compared with their EU counterparts. As a consequence the US leads in patents related to medical technologies, accounting for almost half of all world patents (49% of PCT patent filings), while the EU's share is only one quarter. When it comes to pharmaceuticals, the US also leads with 42% share of patents worldwide, while the EU has 28%.[4].

Figure 9 gives an overview of Europe's technological performance across a range of fields compared with that of North America and Asia. Europe's strength in renewable energy and certain environmental technologies can be clearly observed. However, in a number of key areas, either directly related to societal challenges or in certain enabling fields which will underpin future advances, Europe is faced with strong competition.

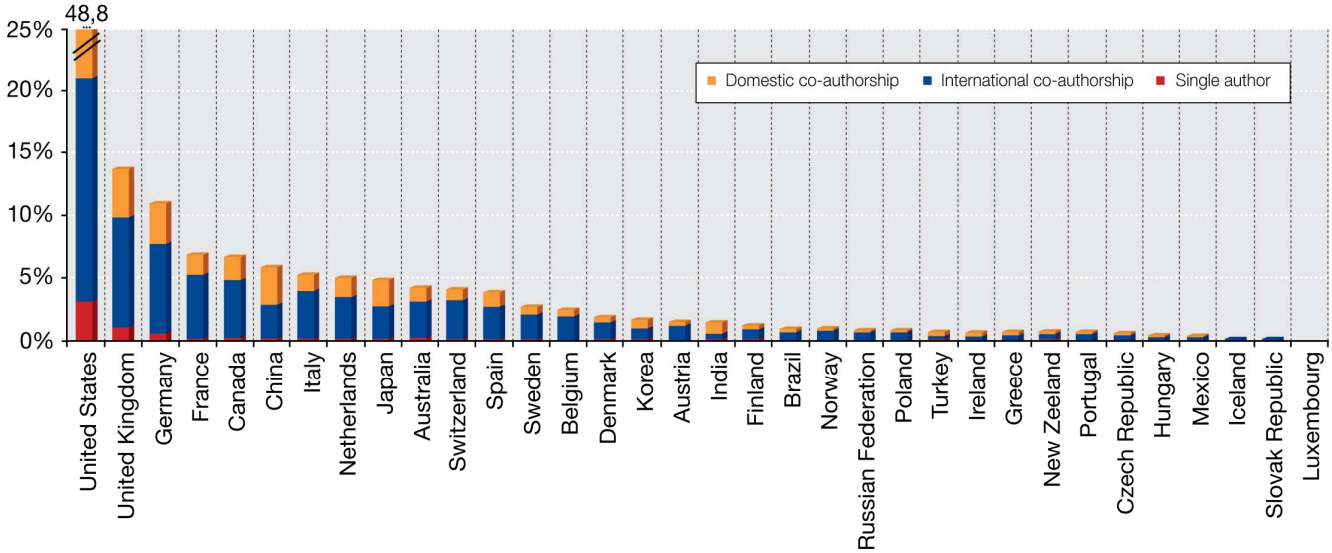
Figure 9: Europe's technological performance compared with North America and Asia[5]



Source: *DG Research and Innovation*

Data: *OECD patent database and specific studies[6]. Europe covers EU27, Iceland, Norway and Switzerland; Asia covers Japan, China, South Korea, Singapore and Chinese Taipei.*

Figure 10: Highly cited (top 1%) scientific articles by type of collaboration, 2006-08
as a percentage of highly cited scientific articles worldwide



Source: DG Research and Innovation
Data: OECD, Measuring Innovation: A New Perspective (2010)

And investing in R&D in a more coordinated way

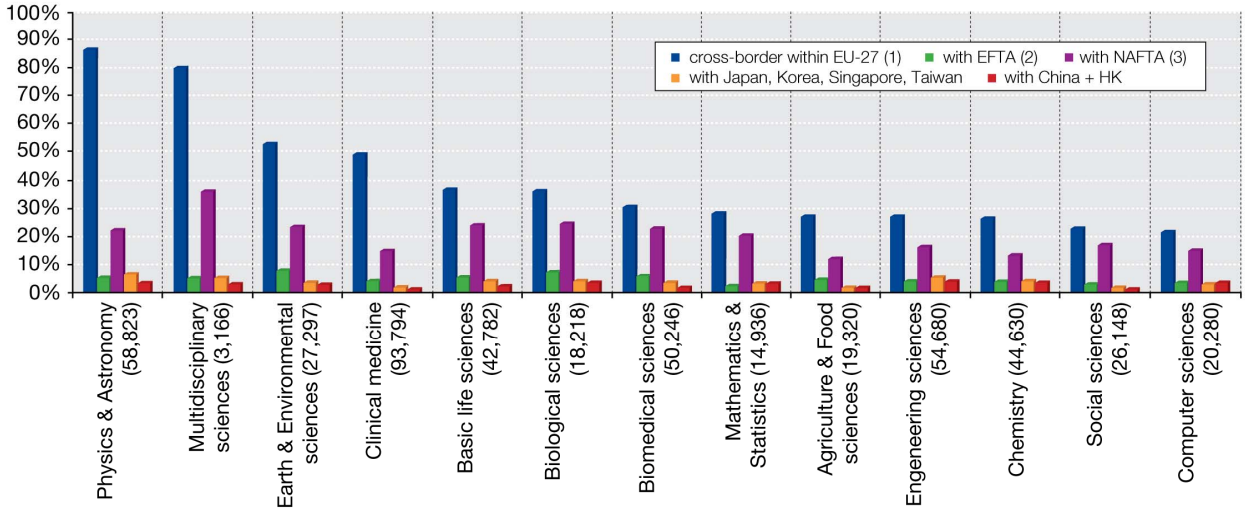
"Integrating the research base by overcoming fragmentation in research" is the first recommendation made in the Interim Evaluation of the Seventh Framework Programme (FP)[7].The national fragmentation of public R&D funding is perceived both as a sub-optimal use of public funding for R&D and as a factor undermining the S&T performance of Europe.

The EU needs to increase the effectiveness of its investment in research and innovation through greater coordination and collaboration. Transnational collaboration in science is known to produce higher impact results and stimulate excellence. **International co-authorship results, on average, in publications with higher citation rates than purely domestic papers (Figure 10).**

Indeed, Europe's scientific impact is higher in those fields where European countries collaborate more:

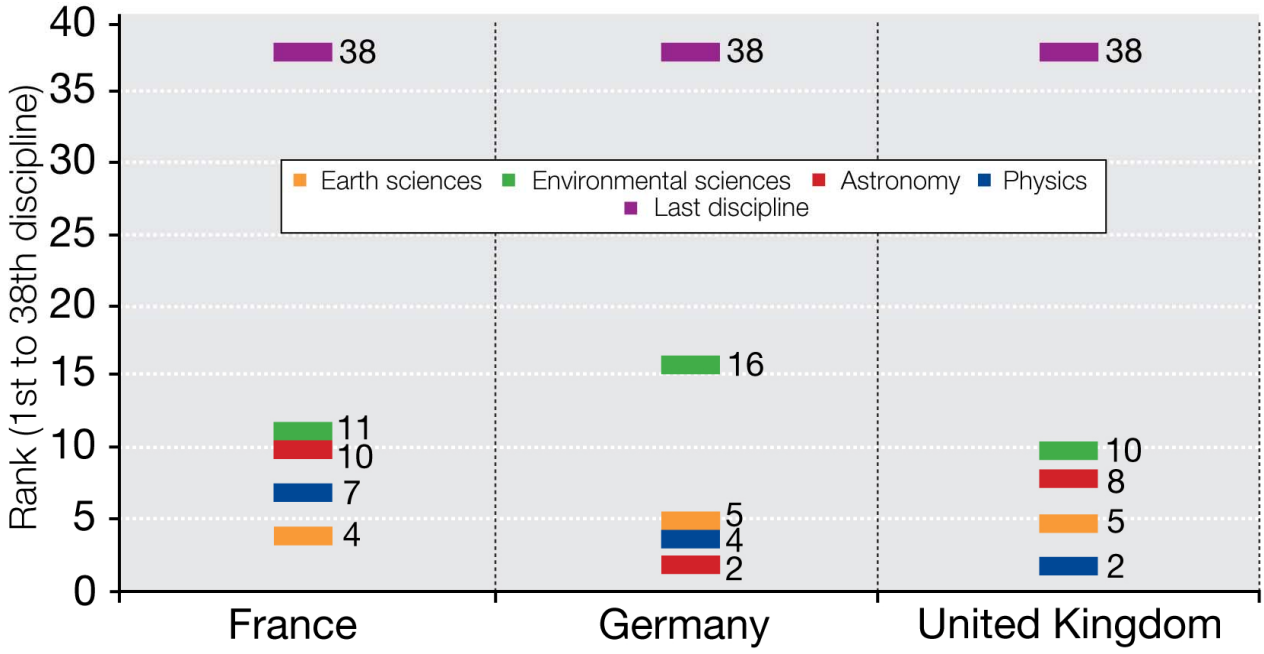
- **The highest share of EU scientific publications involving cross-border European collaboration is found in 'Physics and Astronomy', 'Multidisciplinary sciences' and 'Earth and Environmental sciences' (Figure 11).**
- **And it is in these disciplines[8] where one observes the highest impacts. In the five countries that publish a large part of all EU publications (Germany, France, the United Kingdom, Spain, Italy), publications in these disciplines are more frequently cited than a (world) 'average' publication in the same disciplines[9], and these disciplines are systematically among the disciplines with the highest impact scores in France, Germany and the United Kingdom (see Figure 12). This also holds true in most other EU countries.**
- **For most countries 'Multidisciplinary sciences' also ranks very high in terms impact, in particular in Germany, France and the United Kingdom where it ranks first.**

Figure 11: EU-27 co-publications by main scientific fields, 2006 as % of all EU-27 publications [(4)] (in parenthesis: total number of publications of the field)



Source : DG Researchand Innovation
Data: CWTS-Leiden University / Thomson Reuters, own calculations
Notes: (1) Co-publications involving authors with addresses in at least two Member States
(2) Publications involving at least one author with an address in EU-27 and at least one author with an adress in Switzerland, Iceland, Norway or Liechtenstein
(3) idem (2) with the US, Canada or Mexico
(4) The four categories are not mutually exclusive, as authors based in several world regions may be involved in a given EU-27 publication.

Figure 12: Rank of Astronomy, Physics, Earth and Environmental sciences among 38 scientific disciplines[(1)] according to field normalized impact score 2005-2007



Source: DG Research and Innovation
Data: CWTS-Leiden University / Thomson Reuters
Note: (1) The 38 scientific disciplines cover all natural sciences, social sciences and humanities.

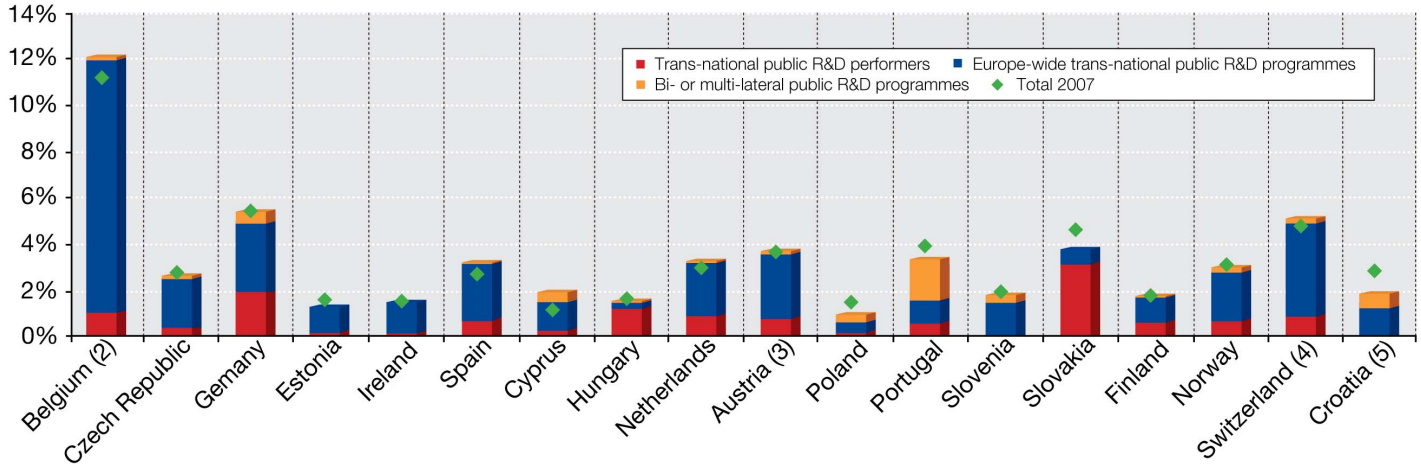
Europe can also make more efficient and effective use of its resources through pooling and sharing them. A good example is that of large scale research infrastructures, where the sharing of costs and access makes sound economic sense.

- **The amount of funds required for their construction cannot be provided by a single European State. The total estimated cost of the 51 research infrastructures of the European Scientific Forum for Research Infrastructures (ESFRI) Roadmap[10] is in the order of 84% of total annual capital expenditure[11] in the EU, or 2.7 times the amount of total 2007-2013 Structural Funds earmarked for research infrastructures in the EU.**
- **In addition, the scientific community that can best make use of one of these facilities is relatively limited in a single country, so that the level of investments for building and operating the facility is incommensurate with the number of domestic users, resulting in a sub-optimal exploitation of these investments.**
- **Indeed the actual value added of some of these large-scale infrastructures is precisely the pooling of data, the multiplication and diversification of experimental cases and contexts that a single country could not gather alone.**

Yet in spite of these benefits of coordination, a recent review of national R&D programmes in 11 European countries showed that very few of them in Europe are genuinely open, in the sense of allocating funding to foreign-based research performers under conditions which are close to the ones applied to domestic actors.[12] The prevailing national approaches to R&D collaboration in Europe are to use EU-level instruments (for trans-national coordination of research activities) rather than opening national funding sources to foreign-based research actors.[13]

However even the trans-national coordination of public R&D funding remains limited: only about 11.1% of public R&D funding in the EU (27 Member States' national R&D budgets plus FP) can be considered as "coordinated public funding of R&D. Of this, 7.5% is attributable to the FP and just 3.6% to various forms of coordinated national funding.[14] Figure 13 shows more detail of these latter forms of coordinated national funding, illustrating how much countries devote from their national R&D budgets to trans-nationally coordinated research. Overall, more than 95% of national R&D budgets are spent nationally without coordination across countries.

Figure 13: National public funding of trans-nationally coordinated research by category (1), as a % of total national GBAORD, 2008



Source: DG Research and Innovation
Data: Eurostat
Notes: (1) Experimental data.
(2) BE: Data of some regional authorities in Belgium are probably not included.
(3) AT: federal or central government only.
(4) CH: 2007 value uses 2006 GBAORD as denominator.
(5) HR: 2007 value uses 2008 GBAORD as denominator.

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1 OECD STI Scoreboard 2009

2 OECD, 2009

3 *Measuring Innovation: A New Perspective*, OECD 2010

4 Source : OECD "STI Scoreboard 2009". Data on medical technology and pharmaceutical patents are PCT filings for the period 2004-2006.

5 (1) For each technology field the graph shows on the X axis the global market share of Europe in terms of EPO/PCT patents compared with the market share of Asia (expressed as a logarithm), and the Y axis shows the market share of Europe compared with the market share of North America (expressed as a logarithm). The size of each bubble is proportional to the number of patents by European inventors in the field. (2) The broad technology domains are shown in bold. (3) Data relate to the period 2003-2005.

6 Data for broad technology domains taken from a study by Research Division INCENTIM, MSI, Faculty of Business & Economics, KULeuven, Università Commerciale Luigi Bocconi, KITES); Data for enabling technologies taken from "European Competitiveness in Key Enabling Technologies" by Birgit Aschhoff, Dirk Crass, Katrin Cremers, Christoph Grimpe, Christian Rammer (ZEW, Mannheim), Felix Brandes, Fernando Diaz-Lopez, Rosalinde Klein Woolthuis, Michael Mayer, Carlos Montalvo (TNO, Delft), May 28th, 2010 (Study commissioned for European Commission DG Enterprise); All other data from OECD Patent Database.

7 Interim Evaluation of the Seventh Framework Programme, report of the Expert group, November 2010.

8 Physics, Astronomy, Earth sciences and Environmental sciences

9 That is, the field-normalized impact scores of these disciplines are above 1 (with the exception of Earth sciences and Environmental sciences in Italy).

[10] As of early 2011, 10 research infrastructures of the ESFRI Roadmap are in the implementation phase and 41 in the preparatory phase (including 3 research infrastructures of the European Strategy for Particle Physics, as approved by the CERN Council).

[11] 'Capital expenditure on R&D' includes expenditure on fixed assets used in R&D activities such as land and buildings and also expenditure on equipment, research instruments and computer software. The other category of R&D expenditure, called 'current cost' includes labour costs and the non-capital purchase of materials and supplies (Frascati Manual).

[12] Study "Investments in joint and open R&D programmes and analysis of their economic impact" funded by DG Research and Innovation, forthcoming.

[13] Recent reviews of R&D programmes in several European countries found that linking national research programmes to EU priorities under the FP, or planning large infrastructures according to EU directions, and using EU-level instruments such as ERA-NETs, are various ways to encourage international collaboration in R&D : (1) *Monitoring progress towards the ERA*, European Commission, ERAWATCH Network, 2009, available at: http://cordis.europa.eu/erawatch/index.cfm?fuseaction=reports.home. (2) National mapping of open R&D programmes in the study "Investments in joint and open R&D programmes and analysis of their economic impact" funded by DG Research, forthcoming.

[14] This comprises (i) trans-national public R&D performers located in Europe: CERN, EMBL, ESO, ESRF, ILL, JRC. Future research infrastructures of the ESFRI Roadmap will belong to this category (ii) Europe-wide trans-national public R&D programmes and agencies: ESA, EMBO, ESF, EUREKA, ERA-NET, ERA-NET+, JTIs (public funding part: ENIAC, ARTEMIS), Art. 185 (Europe-Developing Countries Clinical Trials Platform, Eurostars and Ambient assisted living for the elderly). The Joint Programming Initiatives belong to this category (iii) bi- or multi-lateral public R&D programmes established between Member States governments and with candidate countries and EFTA countries.

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Annex 4: The Economic Role of Science, Technology and Innovation

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ANNEX 4: THE ECONOMIC ROLE OF SCIENCE, TECHNOLOGY AND INNOVATION

INTRODUCTION

Europe suffers from a weak recovery from the economic-financial crisis, from weak economic growth over the last decade, from a long-standing living standards gap with the US, and from dire future economic prospects.

A key reason is Europe's lack of investment in intangibles, in particular research and innovation, which are critical for promoting increases in labour productivity and structural economic growth.

MODERN 'GROWTH ACCOUNTING' LITERATURE

- The key role played by research and innovation in structural economic growth is highlighted by the modern 'growth accounting' literature, which integrates the concept of intangible assets.
- There are three kinds of intangible assets: (1) scientific R&D and non-scientific inventive and creative activities (scientific and creative property); (2) software, computer programs and computerised databases (computerised information); and (3) firm-specific human capital, organisational capital and brand names (economic competencies) (Innodrive, 2009).
- Intangible capital is an essential ingredient for economic growth (Jona-Lasinio et al., 2011). Labour productivity, which in the long term is commonly viewed as connected to the living standards of the workforce, is strongly promoted by the accumulation of intangible capital (Innodrive, 2009). An econometric analysis shows a positive and significant relation between business investment in intangible capital and overall economic labour productivity growth (Roth and Thum, 2010).
- The OECD estimates indicate that in Member Countries like Austria, Finland, Sweden, the United Kingdom and the United States, investment in intangible assets and MFP growth (linked to innovation and improvements in efficiency) together accounted for between two-thirds and three-quarters of labour productivity growth between 1995 and 2006, thereby making innovation the main driver of growth (OECD, 2010b).

MODERN ECONOMIC THEORY

- The modern 'growth accounting' literature confirms what modern economic theory has unanimously recognised for quite some time now: that research and innovation are prerequisites for the creation of more and better jobs, for productivity growth and competitiveness, and for the structural economic growth vital for social cohesion and required to sustain Europe's social model.

MACRO- AND MICRO-ECONOMIC LITERATURE

- This recognition has been based on an extensive body of macro- and micro-economic literature that has produced a number of clear conclusions:
- The economic returns to public and private research are high:
  - **Total R&D:**
    - Empirical work has established robust relationships at the macroeconomic level between investment in innovation and productivity, and firm-level studies have also found positive and significant effects of R&D on productivity growth (OECD, 2010b).
    - A 0.1 percentage point increase in R&D could boost output per capita growth by some 0.3-0.4 per cent (Bassanini and Scarpetta, 2001).
    - A stochastic frontier analysis by the European Commission's Directorate-General Economic and Financial Affairs found that an economy's R&D intensity has a significant positive effect on the number of patents per million inhabitants of that economy and that R&D investments are characterised by non-decreasing returns to scale (Mandl et al., 2008).

- Following a detailed analysis, a team of social scientists has concluded that factors connected with the concept of 'human capital' are responsible for around 70% of the difference in wealth between regions. Three dimensions of human capital are important, one of those relating to productivity and innovation. It is measured by looking at two things: the amount of public and private money being invested in research and technological development (R&D), and the number of patent applications being made in each region (Euractiv).

o **Public R&D:**

- The rate of return for publicly funded R&D usually exceeds 30 percent (Muldur et al., 2006).
- Each extra 1 percent in public R&D generates an extra 0.17 percent in productivity growth (Guellec and van Pottelsberghe de la Potterie, 2001/2004).
- Estimates of the impact of UK Research Council spending on the UK's national output suggest that a cut of £1 billion in annual spending would lead to a fall in GDP of £10 billion (Haskel and Wallis, 2010).
- The US$3.8 billion spent by the US government to map the human genome spurred the creation of tens of thousands of jobs and gave rise to an industry that – while slow to deliver medical breakthroughs- now generates about US$67 billion in annual economic activity. The genome-sequencing project triggered many novel types of economic activity, from the manufacture of sequencing machines and other instruments to the devising of genetic test kits and diagnostic materials used for lab experiments. The investment also produced significant economic returns in the form of tax revenues and personal income. The US$3.8 billion, along with subsequent capital provided by the government and the private sector, generated a total return of roughly US$49 billion in direct and indirect federal tax revenues over the last two decades or so. Over the same period, those initial investments also helped to drive US$796 billion in direct and indirect economic output and generate US$244 billion in total personal income. In 2003, for example, the NIH and DOE together invested US$437 million in the Human Genome Project. That directly led to US$552.9 million in economic activity, the creation of 5,025 jobs and US$51 million in federal tax revenue. When the ripple effect is included, the impact was greater: US$1.65 billion of economic output, 12,422 jobs created, and US$125.5 million in federal tax revenue (WSJ).
- Spending by the National Institute of Health directly and indirectly supported nearly 488,000 jobs and produced US$68 billion in new economic activity in 2010 (WSJ).
- According to UK research, a £1.00 investment in public/charitable CVD research produced a stream of benefits thereafter that is equivalent in value to earning £0.39 per year in perpetuity. The total rate of return for mental health research is 37% (HERG Brunel University et al., 2008).

o **Private R&D:**

- Firms' returns to their own investment in research usually range from 20 to 30 percent (Muldur et al., 2006).
- Societal returns to firm investment in research usually range from 30 to 40 percent (Muldur et al., 2006).
- Each extra 1 percent in business R&D generates an extra 0.13 percent in productivity growth (Guellec and van Pottelsberghe de la Potterie, 2001/2004).

- Research and innovation are vital for industrial competitiveness:

o Research and innovation allow European firms to deal with the competitive threat posed by the low-cost and increasingly high-tech BRIC (Brazil, Russia, India and China) and small East Asian economies.

o The ability to innovate (in addition to size, productivity, the skill intensity of the workforce) is positively related to firms' export performance. It also supports more complex internationalisation

strategies, such as exporting to a larger number of markets, to more distant countries and producing abroad through FDI or international outsourcing (Navaretti et al., 2010).

- On the other hand, firms' export status induces product innovations (learning by exporting). This may be due to the interaction between exporters and foreign customers and in particular the need of a domestic firm to modify its products when entering and staying in a foreign market (Bratti and Felice, 2010).

- Domestic research is necessary to be in a position to absorb the results of foreign research (international spillovers):
  - Each extra 1 percent in foreign R&D generates an extra 0.44 percent in productivity growth. This means that R&D not only benefits highly R&D-intensive countries but also R&D followers, but they must carry out a minimum of R&D to be able to absorb the results of others (Guellec and van Pottelsberghe de la Potterie, 2001/2004).
- Technological change boosts employment:
  - The often accepted view that innovation destroys jobs is wrong. Innovations have a positive and significant effect on employment, which persists over several years (Van Reenen, 1997).
  - For instance, an increase in business R&D by 1 percent is associated with an increase in business employment of 0.15 percent (Bogliacino and Vivarelli, 2010).
- Research-intensive sectors create more and better jobs:
  - Long-term, high-quality jobs stay in industries where there is a high degree of innovative content and where innovation, manufacturing, and end-user demand are tightly integrated.
- R&I can significantly help economies re-emerge from deep crises. Finland and Korea responded to their economic crises in the 1990s by investing heavily in R&D while severely constraining public spending; these investments helped their strong re-emergence in knowledge-based economies (CaSE, 2010).

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Annex 5: Information on Econometric Modelling Used in the Report (NEMESIS) - Description, Assumptions and Results)

{COM(2011) 808 final}
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ANNEX 5: INFORMATION ON ECONOMETRIC MODELLING USED IN THE REPORT (NEMESIS) DESCRIPTION, ASSUMPTIONS AND RESULTS

Nemesis is a general equilibrium model built by a European Commission-funded consortium of European research institutes under the 5th Framework Programme. Nemesis has been used by the European Commission for the ex-ante impact assessment of FP7 and for assessing the macro-economic impact of achieving the objective of investing 3 percent of Europe's GDP in research and innovation ("3 percent objective"), by the OECD, by a number of French government institutions, etc.

For the CSF impact assessment, DG Research & Innovation developed, in collaboration with the DEMETER consortium operating Nemesis, 5 different future-oriented scenarios: (1) Business-as-usual; (2) Common Strategic Framework for Research and Innovation; (3) Common Strategic Framework for Research and Innovation + achievement of the 3 percent objective; (4) Renationalisation; and (5) Discontinuation.

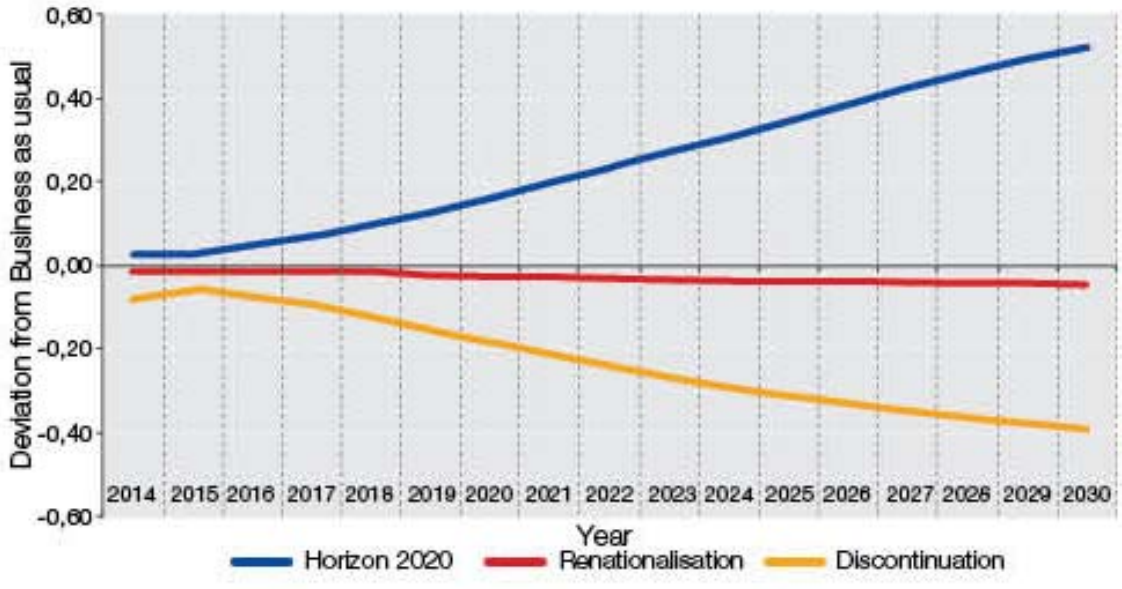
These scenarios were operationalised through a number of key model parameters including the real EU and national research and innovation funding growth rates; the allocation of EU research and innovation funding to EU Member States, to basic vs. applied research, and to sectors; the EU and national research and innovation funding crowding-in fators and multipliers; the intersectorial and international spillovers. The scenarios and the specific assumptions underpinning each of them are detailed in Table 1 below. The difference between the BAU, CSF and other scenarios hinged mainly on the scale of EU research and innovation funding, and on the size of the crowding-in effect and the economic multiplier associated with the intervention.

All BAU assumptions were based on academic literature. The BAU FP and national net private sector funding crowding-in effects of 0.7 and 0.5, for instance, were derived directly from Guellec and Van Pottelsberghe (2000), European Commission (2004).

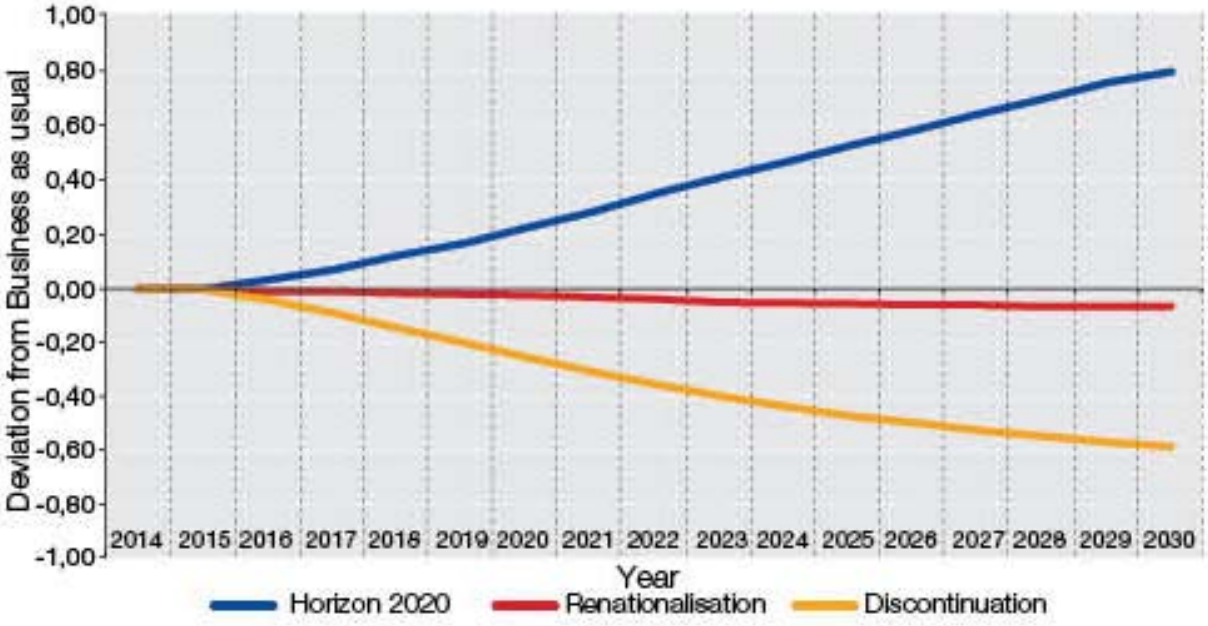
The CSF assumptions were necessarily based on deduction and analogy. Because of simplification and therefore enhanced industrial participation, and because of closer knowledge triangle coordination and therefore enhanced valorisation of research results, crowding-in effects and economic multipliers, for instance, were assumed to be higher than those associated with the BAU option.

The DEMETER consortium produced for each of these scenarios results on GDP, exports, imports, and employment through 2030. In the figures below, these results are presented as deviations from the business-as-usual scenario.

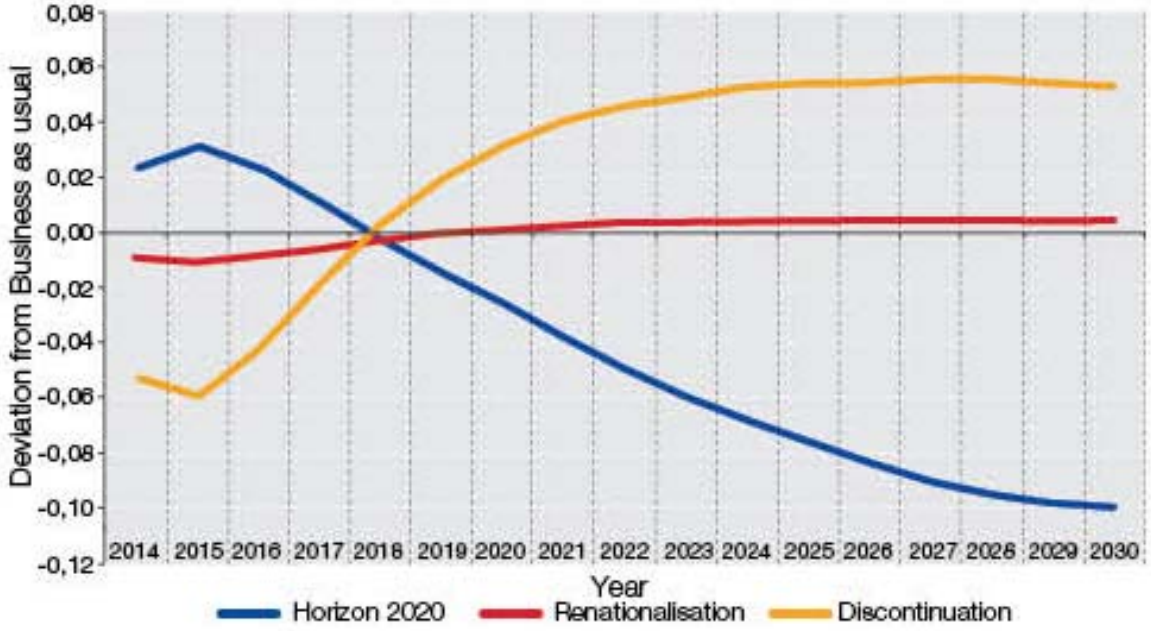
Impact of the different options on GDP



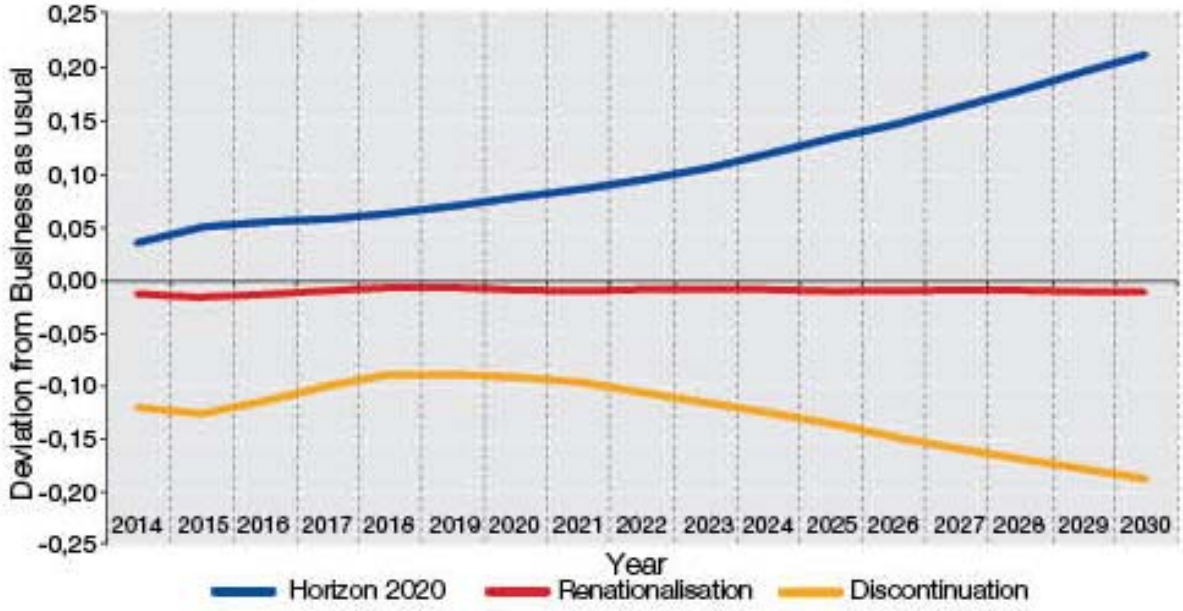
Impact of the different options on exports



Impact of the different options on imports



Impact of the different options on Employment



	Business as usual	Preferred		Renationalisation	Discontinuation - Cost of non-Europe
		CSF	CSF+3%		
FP funding real growth rate 2014-2020	€8,31 billion (2014 prices) spent in 2014; thereafter adjusted for inflation (2%) only	2014: 10,70 billion; 2015: 11,40 billion; 2016: 12,12 billion; 2017: 12,87 billion; 2018: 13,65 billion; 2019: 14,45 billion; 2020: 15,27 billion (current prices, no need anymore to adjust for inflation; already done)	2014: 10,70 billion; 2015: 11,40 billion; 2016: 12,12 billion; 2017: 12,87 billion; 2018: 13,65 billion; 2019: 14,45 billion; 2020: 15,27 billion (current prices, no need anymore to adjust for inflation; already done)	€8,31 billion (2014 prices) spent in 2014; thereafter adjusted for inflation (2%) only	€8,31 billion (2014 prices) spent in 2014; thereafter adjusted for inflation (2%) only (negative effect)
FP funding real growth rate 2021-2030	Continuation of above	Increase further every year by 450 million and adjust for inflation (2%)	Increase further every year by 450 million and adjust for inflation (2%)	Continuation of above	Continuation of above (negative effect)
National funding real growth rate 2014-2020	Constant (latest available) national R&D intensity	Constant (latest available) national R&D intensity	Reach National Reform Plan (NRP) R&D intensity objectives by 2020 (sent)	Constant (latest available) national R&D intensity	Constant (latest available) national R&D intensity reduced by discontinued FP amount
National funding real growth rate 2021-2030	Continuation of above	Continuation of above	Once objectives reached, constant R&D intensity	Continuation of above	Continuation of above
Allocation of FP funding to EU MS	Like under FP7	Based on innovation performance	Based on innovation performance	Like under FP7	Like under FP7 (negative effect)
Allocation of FP funding to basic and applied research	40% basic, 60% applied	40% basic, 60% applied	40% basic, 60% applied	40% basic, 60% applied	40% basic, 60% applied
Allocation of FP applied research funding to sectors within MS	Grandfathering	Grandfathering	Grandfathering	Grandfathering	Grandfathering
FP funding crowding-in factor for the private sector (net additional funding generated)	0.9	1.1	1.1	0.7	0.9 (negative effect)
FP funding crowding-in factor for the public sector	0.5	0.5	0.5	0	0.5 (negative effect)
National funding crowding-in factor for the private sector (net additional funding generated)	0.7	0.7	0.7	0.7	0.7
National funding crowding-in factor for the public sector	0	0	0	0	0
Multiplier for R&D resulting from EC funding	6 percent better than national	15 percent better than national	15 percent better than national	National	National
Multiplier for R&D resulting from national funding	National	National	National	National	National
Intersectorial spillovers	+	+	+	+	+
International spillovers	+	+	+	+	+

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Annex 6: Euratom

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ANNEX 6: EURATOM

1. Procedural issues and consultation of interested parties

This annex contains supplementary information on the Euratom Research and Training Programme (2014-2018). Following the European Commission's decision of 29 June 2011 to bring together all EU research and innovation funding in a coherent, from-research-to-innovation overarching framework, the Euratom Research and Training Programme, hereinafter the Euratom Programme, is an integral part of 'Horizon 2020', the Framework Programme for Research and Innovation (2014-2020).

Commission's proposal for the Euratom Programme concerns research and training actions in the following fields: nuclear fission and radiation protection, nuclear fusion. The construction and related activities for ITER are subject to a separate proposal for a suplementary research programmme and therefore are not covered in this document.

For general information on organisation of the impact assessment exercise, including consultation and use of expertise please refer to the main report on the impact assessment for Horizon 2020. The following section provides specific information on consultation and expertise for preparation of the Euratom Programme.

Two workshops (consultations complimentary to the dedicated consultation on the basis of the Green Paper) have been organised with the objective of discussion the energy challenge of the future EU Research and Innovation Programmes with experts and representatives of governments. Both workshops covered nuclear and non-nuclear issues. The first workshop with non-governmental experts (from SET Plan technology platforms and research centres) took place on 23 June 2011. Stakeholders emphasised the substantial contribution of nuclear energy with regard to energy security and reducing greenhouse gas emissions as well as the leading position of European industry in nuclear energy. The second workshop with representatives from governments took place on 14 July 2011. Most delegations agreed on the importance of nuclear energy's contribution to the European Energy and Climate policy objectives.

Extensive evidence has been used for preparation of this report (for details please refer to specific footnotes):

- Euratom FP7 interim evaluations
- Quantitative input to the fusion part of the IA by an expert group appointed by the Commission
- Report of the Consultative Committee for Fusion (CCE-FU) "Strategic Orientation of the Fusion Programme" which details the main objectives of the fusion R&D programme and possible programme scenarios with different volume and pace of activities and consequences for the long term outlook of fusion research.
- Input from Euratom's Scientific and Technical Committee (STC)

2. Problem definition

2.1. Challenges for nuclear research and training

Nuclear energy is a mature low-carbon energy technology that is deployed at the industrial scale in many EU Member States[i]. Radiation is also used in industry and research, and in medical diagnostic and therapeutic techniques.

The main challenges as regards current nuclear technology in order for it to further contribute to competitiveness, security of supply and the decarbonisation of European energy systems are to ensure continuing high levels of safety, develop solutions for management of ultimate waste and maintain nuclear skills. Equally important is the need to ensure a robust system of radiation protection, taking into consideration the benefits of the uses of radiation in medicine and industry. In view of the increasing concerns about the risk of non-proliferation and the threat of nuclear terrorism it is also necessary to develop appropriate safeguards in order to assure nuclear security in Europe and worldwide.

Advanced nuclear technology has the potential to make a major contribution to the realisation of a sustainable and secure base-load energy supply for the EU in a few decades from now[ii,3]. The first steps to

realise this potential are to demonstrate feasibility of fusion as a power source and to construct and operate next generation fast neutron reactor (FNR) demonstrator plants. Efforts to make advanced nuclear energy a reality can be justified by the availability of fuel (hydrogen and lithium in the case of fusion, or uranium and thorium with 50-100 times increased utilisation compared with present reactors in the case of FNRs – are inexpensive and readily available), no risk of severe accidents in the case of fusion, and limitation to the reactor site of the impacts of severe accidents in the case of FNRs. Fusion plants will produce only a limited amount of short-lived radioactive waste, and FNRs will be able to consume much of their own long-lived waste, though geological disposal of the ultimate waste will still be required to eliminate burdens on future generations.

To address these challenges and to bring benefits to the European citizens, a substantial research effort is needed to provide solutions for the following issues**:**

a) Nuclear safety of current and future power plants: Research will need to address issues of relevance for Europe arising from a detailed analysis of the Fukushima accident[iii], in particular any identified in the 'stress tests' being carried out in the EU[iv]. It is also important to maintain on-going research on issues of importance to the current fleet of reactors, in particular related to lifetime extensions and long-term operation. The current nuclear fleet in Europe is based mostly on Light Water Reactors (LWR) that have been in operation for about 25+ years on average. Current plans in most EU Member States are to extend their lifetimes on a case-by-case basis beyond 40 years, and possibly beyond 50 years. Key R&D issues are related to meeting safety requirements for long-term operation focussing on ageing of structures, systems and components. Other important issues are ageing mechanisms, monitoring and prevention and mitigation measures. Finally, research can also lead to improved efficiency of existing plants through reducing uncertainties in such areas as fuel performance[v]. The focus on safety will also need to extend to fundamental design work on next generation systems.

b) **Management of ultimate waste:** As indicated in the Commission's revised draft proposal for a Council Directive on the Management of Spent Fuel and Radioactive Waste[vi], all EU Member States produce radioactive waste, which is generated by civil nuclear power and radioisotope applications in medicine, industry research and education. More than half of Member States have accumulations of spent nuclear fuel, or residues from the reprocessing of this fuel, as a result of the operation of nuclear power plants. The general principle is that those who benefit today from these activities should manage the resulting waste in a safe and sustainable manner. This is also the overwhelming view of European citizens[vii], whose acceptance of nuclear energy is also strongly correlated to the implementation of solutions to safely manage nuclear waste. The R&D work carried out over last three decades has confirmed that deep geological disposal is the most appropriate solution for long-term management of spent fuel, high-level waste, and other long-lived radioactive wastes[viii]. This scientific consensus now needs to be turned into an engineering reality, and this will be the focus of attention over the coming decade[ix]. In addition to the implementation of geological disposal of ultimate waste, it is of great importance to minimize upfront the waste production to the maximum extend. This may be done by developing specific working techniques, processes and procedures leading to waste minimization. For Minor Actinides contained in spent fuel, research in partitioning and transmutation need to be pursued to demonstrate the feasibility to reduce the lifetime and radiotoxicity of the ultimate waste.

c) **Education and training in nuclear field:** As a generation of nuclear physicists and engineers retires and a series of nuclear 'phase-out' policies in some Member States leaves a gap in new talent entering the workforce, education and training have become driving concerns for every sector in the nuclear field[x]. This is a crucial issue even for countries phasing out their nuclear programmes, as existing facilities need to be operated for at least the next 15 years. Nuclear expertise is also needed for all industrial and medical applications based on ionising radiations, as well as for decommissioning activities related to old nuclear installations. Maintaining knowledge in these disciplines, along with appropriate programmes of nuclear education and training, are essential prerequisites for a high level of nuclear safety and nuclear safety culture[xi].

d) **Next generation fission systems:** Today's light water reactor technology uses less than 1% of the energy content of the mined uranium, which limits the sustainability of nuclear energy to a few decades because of the finite nature of the world's uranium reserves[xii]. By contrast, fast neutron reactors can

extract 50-100 times more energy from the same quantity of uranium, making nuclear much more sustainable[xiii]. Furthermore, fast reactors are able to produce far less high-level long-lived waste, with a lower heat load, thereby greatly facilitating the management in future geological repositories. However, many R&D challenges remain, for example to address cost competitiveness, enhanced safety and non-proliferation, requiring innovation both in reactor designs as well as fuel and fuel cycle technology[xiv]. Though next generation fast neutron reactors are not expected to be widely deployed commercially before 2040, prototypes and demonstrators need to be designed and constructed in the next decade to enable sufficient return from experience before commercial deployment. Similarly, work on advanced high and very high temperature reactors can lead to the development of cogeneration systems capable of providing low carbon process heat for many industrial processes. In parallel to these advances on so-called 'Generation-IV' systems, a broad-based programme of R&D is needed in key areas such as materials, numerical simulation and safety. In many of these areas there are important synergies with research on materials and technologies for fusion power plants.

e) **Nuclear safeguards and security:** Expansion of civil nuclear technology worldwide brings with it an increasing concern about the risk of nuclear non-proliferation and the threat of nuclear terrorism. Safeguards of sensitive nuclear materials which rely on profound knowledge and expertise will therefore necessitate continued research and innovation efforts at EU and worldwide level.

f) **Radiation protection**: Radiation protection research is particularly important in view of the rapidly growing use of radiation in medical diagnostic and therapeutic techniques, which is responsible for a significant rise in public exposure, especially at low doses[xv]. Further multidisciplinary research is needed to determine the mechanisms involved and to quantify the risks of latent cancers and vascular diseases at these low doses. Radiation Protection in emergency situations such as under accidental conditions on and off-site require continued attention and improvements.

g) **Move toward demonstration and feasibility of fusion as a power source** To demonstrate feasibility of fusion as a power source, research must be carried out using existing and future research facilities such as JET and W7-X. This will allow expanding the knowledge base and maximising the scientific output of ITER, a scientific experiment, moving beyond present understanding in the key areas of plasma physics and technology. To achieve this, the research programme must: (i) develop operational scenarios that will secure and even exceed the baseline performance, and (ii) ensure the rapid and efficient start up of future fusion facilities, and protect the investment by minimising the chances of unexpected technical problems that would delay exploitation or incur extra cost for these facilities.

h) **Prepare the future generation of fusion researchers and engineers:** For carrying out fusion research Europe must ensure that it will have a sufficient number of highly skilled professionals (operators of large fusion devices including ITER, fusion scientist, programme leaders and engineers for design and construction). Fusion research programme should encourage talented young scientists and engineers to develop their careers in Europe, and to ensure that Europe will have the necessary human resources to exploit ITER in an international and competitive environment, avoiding the risk of ceding the future leadership of fusion research to our international partners.

i) **Lay the foundations for fusion power plants:** While ITER is the major step towards demonstration of feasibility of fusion as a power source, it is also necessary to launch the preparations for a demonstration power plant (DEMO) to demonstrate the commercial generation of electricity using fusion. The challenge is to position Europe so that it can build rapidly on the results from ITER to move as quickly as possible to the demonstration power plant, retaining a significant share of the intellectual property of fusion technology.

j) **Involve industry more closely and promote innovation**: by integrating industry in the development of fusion power plant studies, enhancing the transfer of knowledge and creation of spin offs from the programme as well as developing the skills and capacities necessary for a European fusion industry of the future. Already, industry is deeply involved in the construction of ITER, particularly as a supplier of high-tech components. Fulfilling these contracts will involve the transfer to European industry of expertise and know-how built up over a long period in the European fusion programme. This will stimulate innovation and increase the competitiveness of European high-tech industry. To meet the

challenges inherent in this process, the Commission has launched a Fusion Industry Innovation Forum bringing together representatives of major industries, fusion research institutes and the Commission.

2.2. What is the situation in the private sector?

Fission: The assessment of the corporate R&D investments in nuclear energy is based on a limited number of companies, reflecting the consolidated situation in this sector in Europe and worldwide. French companies (AREVA, EdF) largely dominate the total corporate R&D investments in nuclear fission. Corporate research into all nuclear fission-related aspects amounted to around €550 million in 2007, of which R&D investment in nuclear reactor technology may be in the order of €200 million (i.e. ca. more than one-third)[xvi]. More recent data on the true level of investments in nuclear R&D is not available. However, an order of magnitude estimate of corporate R&D investments can be derived from the 2010 EU Industrial R&D Investment Scoreboard[xvii], which shows that companies with substantial activities in nuclear sector (utilities and construction)[xviii] spent almost 1200 million Euro on R&D (for nuclear, reneweables and fossil sources) of which ca. 71% (852 million Euro) was spent by AREVA and EdF alone. The electricity industrial sector is described by the 2010 EU Industrial R&D Investment Scoreboard as a medium-low R&D intensity sector (between 1% and 2% of net sales is spent on R&D).

The main focus of R&D investment in the nuclear sector is lifetime extension of currently operating plants and, in countries where the political and societal climate is right, technology developments in evolutionary LWR technology linked with new build projects[xix]. The R&D efforts of the private sector are to a certain extent fragmented and often duplicated owing to the fact that European utilities operate in an increasingly competitive market.

Financing schemes for waste management are based on the "polluter-pays principle", often involving a small levy on the price of nuclear electricity. Either electricity utilities make provisions in their accounts or, increasingly, State-managed ring-fenced funds are established[xx].

The nuclear industry is currently not prepared to invest heavily in the development of Generation-IV reactors because this technology is still 20-30 years away from possible commercial deployment and as a result there is considerable political, regulatory and economic uncertainty. The public sector continues to have a role at the stage of pre-commercial research in advanced technology, also in a context of international cooperation (e.g. Generation-IV International Forum[xxi]), but industry will be expected to contribute much more significantly during the next stage in the development of advanced systems, beyond the design and construction of demonstration plants, entering into a First-Of-A-Kind commercial plants and further replication

Fusion: fusion energy R&D is funded only by the public sector: the private sector does not yet invest in fusion because the time horizon is too long (2040-2050)**.** The generation of electricity from fusion power requires the control and understanding of very complex physical processes which can only be achieved using large experimental infrastructures. Many scientific milestones have already been achieved, the most important of which is the controlled generation of fusion energy in the JET device in 1997[xxii]. While this was a significant marker on the path to commercial fusion power, it is still distant from commercial exploitation and therefore entirely supported by public funding. ITER will bring commercial fusion power a step closer, but it illustrates the timescales involved: the detailed ITER design, including necessary experimentation and component prototyping, took close to 10 years (followed by about 5 years of international negotiations on legal structures and siting) and the lifetime of the project is 30 years[xxiii]. Moreover, ITER is still an experiment and therefore carries the risk that it will not achieve all its aims. This risk has been mitigated by spreading the cost among seven partners in an international consortium, which also maximises the scientific and industrial expertise available to the project.

Private investment will be a necessary aspect of the demonstration fusion power plant (DEMO) which will follow ITER. By that stage the technology will have matured to a stage where industrial investment can take over the commercialisation of fusion power in the timeframe beyond 2050. Even though the private sector does not invest in fusion, it is involved in public procurements for fusion (ITER, JET and smaller fusion facilities), which brings mutual benefits (technology transfer, development of new products and new skills)[xxiv].

2.3. What is the situation in the public sector of Member States?

Fission and radiation protection: Member States contribute to research on issues of political and societal concern such as nuclear safety, radioactive waste management and radiation protection. This stems from the societal decision to exploit nuclear technology and the associated shared responsibility of the State with the license holder to ensure appropriate levels of health protection for workers and citizens. In particular, publicly funded research can ensure that an appropriate balance between the risks and benefits is maintained and that regulations neither unduly prevent exploitation of potentially beneficial technologies nor expose individuals to unjustified risks. However the available data demonstrate that these efforts are fragmented and underfunded in some areas (LWR, nuclear supporting technology, Generation-IV). In addition, research priorities differ between Member States, as demonstrated by a table below (latest available IEA data shown for Member States for which a breakdown is provided[xxv]):

Breakdown of budget for R&D in nuclear field *The most recent data available, million euro*								
	Germany		**France**		**Finland**		**Belgium**	
	2009	**%**	**2008**	**%**	**2008**	**%**	**2007**	%
Light-water reactors (LWRs)	21.1	50.2%	9.1	2%	0.3	3%	24.0	61%
Other converter reactors	0.0	0%	38.3	9%	0.0	0%	0.0	0%
Fuel cycle	10.7	25.4%	66.2	15%	2.3	25%	3.6	9%
Nuclear supporting technology	0.0	0%	316.1	71%	6.8	72%	11.8	30%
Nuclear breeder	0.0	0%	9.1	2%	0.0	0%	0.0	0%
Other nuclear fission	10.2	24.4%	7.0	2%	0.0	0%	0.0	0%
Total	42.0	100%	445.7	100%	9.5	100%	39.4	100%
Source: IEA								

The very rough estimate prepared on the basis of IEA data for the period 2000-2009[xxvi] shows that public R&D expenditure in Member States was focused on nuclear supporting technology (48% - this category of expenditure concerns nuclear safety, radiation protection and decommissioning, control of fissile materials), followed by the fuel cycle (32%) and R&D specifically related to light water reactors including safety and environmental aspects (11%). Expenditure that can be classified as Generation-IV (nuclear breeders, high temperature reactors, advanced gas cooled reactors) accounted for only about 7% (€43 million in 2007)

According to JRC report[xxvii], Member States' R&D investment in nuclear reactor R&D (reactor technologies and fuel cycle) amounted to around €253 million in 2007. This represents about 43% of the total estimated expenditure in all nuclear fission-related R&D (€587 million). Similarly to the situation in corporate R&D expenditure, public funding for R&D is largely concentrated within France. In 2007, France accounted for more than half of the total EU Member States public investment in nuclear-related research. This result is in line with France's large share of nuclear generating capacity in Europe, i.e. about 50%. Other Member States investing significantly in nuclear research included Italy, Germany and the Netherlands.

Fusion: R&D in fusion energy is fully publicly financed in Europe and all research activities are coordinated within the integrated European fusion programme[xxviii]. The total expenditure on fusion in 2007 and 2008 amounted to €582.48 and 607.24 million (direct expenditure of Member States 53% and 51% respectively with the remaining part funded by Euratom)[xxix].

The expenditure of Member States on fusion R&D in 2007 and 2008 is shown in the table below. Four EU Member States (Germany, France, Italy and UK) and Switzerland (a participant in the EU fusion programme since 1978) account for more than 80% of the overall expenditure, with Germany accounting for ca. 40%. Duplication and fragmentation of efforts of Member States is avoided by the fact that all national R&D programmes are coordinated through instruments of the European fusion programme (Contracts of Association and the European Fusion Development Agreement).

Expenditure of EU Member States and Switzerland on fusion R&D in 2007 and 2008				
Country	2007 (mln EUR)	% of total	2008 (mln EUR)	% of total
Austria (ÖAW)	3.3	1.1%	3.1	1.0%
Belgium (LPP ERM – KMS)	4.9	1.6%	5.5	1.8%
Bulgaria (BAS)	0.2	0.1%	0.5	0.2%
Czech Rep (IPP.CR)	3.1	1.0%	1.3	0.4%
Denmark (RISØ)	1.9	0.6%	1.8	0.6%
Finland (TEKES)	4.2	1.4%	2.8	0.9%
France (CEA)	45	14.5%	46.3	14.9%
Germany (IPP. FZJ. FZK)	120	38.6%	137.7	44.2%
Greece (HR)	1.2	0.4%	1.6	0.5%
Hungary (HAS)	1.2	0.4%	1.0	0.3%
Ireland (DCCU)	1.2	0.4%	1.1	0.4%
Italy (ENEA)	52.1	16.8%	41.3	13.3%
Latvia (UoL)	0.3	0.1%	0.6	0.2%
Lithuania (LEI)	0.1	0.0%	0.2	0.1%
Luxembourg (ME)	0.1	0.0%	0.0	0.0%
Netherlands (FOM)	11.3	3.6%	9.7	3.1%
Sweden	5.2	1.7%	4.3	1.4%
Poland (IPPLM)	1.6	0.5%	1.6	0.5%
Portugal (IST)	4.4	1.4%	4.8	1.5%
Romania (MEdC)	1	0.3%	1.0	0.3%
Slovakia (AECU)	0	0.0%	0.7	0.2%
Slovenia (MHEST)	1.2	0.4%	1.3	0.4%
Spain (CIEMAT)	11.5	3.7%	10.2	3.3%
Switzerland (CRPP)	13.2	4.2%	12.6	4.0%
UK(former UKAE. now CCFE)	22.6	7.3%	20.5	6.6%
TOTAL	**310.8**	100.0%	**311.4**	100.0%
Source: European Commission, 2011, Expenditure is not indicated for Estonia, Cyprus and Malta as fusion labs in these Member States are part of Finnish, Greek and Italian Association respectively.				

2.4. Why EU-level intervention is necessary?

The challenge of nuclear safety and diminishing nuclear skills in Europe can be tackled effectively by exploiting synergies between research efforts of Member States and the private sector, and between scientific disciplines and technological sectors. An EU-level intervention can strengthen the research and innovation framework in nuclear technologies and coordinate Member States' research efforts thereby avoiding duplication, retaining critical mass in key areas and ensuring public financing is used in an optimal way. An EU-level programme also take on the high risk and long-term R&D programme in fusion energy, thereby sharing the risk and generating a breadth of scope and economies of scale that could not otherwise be achieved.

Nuclear research is the only area of research that has a direct mandate in the treaties (Articles 2, 4 and 7, and also Annex 1, of the Euratom Treaty[xxx]). The European added value of nuclear research is explicit in the Euratom Treaty itself and the Commission has an obligation to put forward an R&D programme to complement those in Member States.

The justification for Euratom intervention is based mainly on the need to ensure high and uniform levels of nuclear safety in Europe.

In the area of lifetime extension, the main challenge for Euratom support is to ensure the availability and acceptance of standard tools and methodologies across Europe[xxxi]. Owing to the nuclear safety implications, it is unacceptable that plant lifetime extension decisions in one country are not based on the same criteria and techniques as in others. The aim of public intervention is to ensure consistency and harmonisation especially to guarantee high and uniform levels of nuclear safety. Funding on lifetime extension by the utilities themselves is often proprietary and at significantly higher levels than the public component.

The justification for Euratom intervention in the area of management of radioactive waste is similar to the case of nuclear safety and plant lifetime management. The issue of long-term management of waste is one of high public concern, and Euratom action ensures that a common European view on key issues related to long-term safety prevails, that harmonised standards and practices are put in place, and also that technology transfer takes place from the most to the least advanced Member States. This is particularly important in view of the recently adopted EU Directive on the management of radioactive waste that seeks to end 'wait and see' attitudes regarding waste management in some smaller Member States.

A similar approach is needed in the area of education and training. The role of the Euratom's action is to stress common programmes, transferability and mutual recognition of qualification and skills so that the nuclear sector and society as a whole benefits – again, the driver for this is the need to ensure high levels of nuclear safety and to promote an appropriate safety culture.

During the last 10 years, the Euratom programme has fostered greater cooperation between nuclear research and industrial actors[xxxii]. This has been largely through the establishing of broad-based 'technical forums' in key areas (and the defining of related Strategic Research Agendas, SRA), and the strengthening and focusing of Member States R&D efforts thanks to the overall framework provided by the SET-Plan. The establishing of SRAs and the implementation of the SET-Plan in the nuclear field has resulted in restructuring of the R&D activities in fission and cooperation in key R&D infrastructure projects. These efforts need to continue, encouraging true joint programming between Member States, the establishing of legal entities and public-private partnerships where necessary (in particular driven by industry as end-users), and the de-compartmentalisation of research sectors to maximise synergies between scientific and technological disciplines (not only between, for example, advanced fission and fusion but also between nuclear and non-nuclear energy).

2.5. What is the added value of nuclear research at EU level?

The European added value of the Euratom programme is demonstrated by the following achievements in increasing nuclear safety, concentrating Member States' R&D efforts and strengthening innovation:

a) **The Euratom R&D programme provides a flexible and effective instrument to support research in nuclear safety**. Although it is still too early to draw final conclusions from the Fukushima accident and the results of the nuclear stress tests in the EU, already the events in Japan are provoking a widespread re-assessment of nuclear safety in Europe. Initially this is concentrating on regulatory practice and demonstrating resistance to extreme external hazards, but there may be important implications for research. The Euratom programme is an appropriate instrument to coordinate and carry out the necessary activities. This was the case following the Chernobyl accident, with a substantial EU investment of EUR 40 million over 20 years in the PHEBUS programme (core melt experiments in controlled conditions) and Euratom funding in other areas such as emergency management and rehabilitation of contaminated territories. In fact, Europe is the only region of the world maintaining significant competences in the area of radioecology – the study of the impact of radioactive contamination on ecosystems in general. The project STAR[xxxiii], a Network of Excellence to ensure long-term sustainability of the radioecology research sector, was launched at the beginning of 2011;

following the events at Fukushima, discussions have already begun to add a Japanese partner in the consortium.

b) Action at European level (Euratom) can quickly **mobilise a wider pool of excellence, competencies and multi-disciplinarity** than is available at national level.

In the fission area, projects such as NULIFE (understanding of the factors affecting the lifetime of nuclear power plants), STAR (skills in radioecology), DoReMi (low dose research) and SARNET-2 (research on severe accidents in nuclear power plants) are ensuring that competences in key technical sectors can be pooled and retained in Europe, requiring the bringing together of expertise from many Member States, and the establishing of legal entities to ensure sustainability and long term access to research results.

The achievements of the fusion programme resulting from joint exploitation of JET, rely on the collective endeavours of researchers and engineers from all across Europe (about 350 persons per year), supported by Euratom funding for mobility. Euratom finances two mobility schemes, one used generally for short visits to JET and between Associations (ca. EUR 5 million per year) and the other aimed mainly at longer term participation in the collective exploitation of JET (stays up to 4 years).

c) Action at European level (Euratom) can help generate an **optimum programme of activities and maximise knowledge sharing** and information dissemination, lowering the overall costs of achieving a given objective.

The extensive network of collaborations between fusion laboratories (Associations) and the collective exploitation of JET help bring the best expertise to bear on all the research issues, and provide Europe-wide sharing of expertise. A growing majority of publications (about 57%) originate from the joint efforts of two or more laboratories in different Member States. These papers also have a higher than average number of citations.

Euratom projects in the field of Partitioning and Transmutation, from the EUROTRANS project in FP6 to those focused on the design of the MYRRHA facility, represent a comprehensive and integrated programme of research on Accelerator Driven System and related lead-cooled technology. This programme is also notable for the involvement of large numbers of PhDs and post-docs and the interaction with other research in Generation-IV systems. All this, including the decision by the Belgian Government to construct MYRRHA, would not have been possible without Euratom involvement.

d) Action at European level (Euratom) can have a **strong leverage effect on coordinating national efforts**, through the use of funding instruments that promote the European Research Area.

These effects are well demonstrated in the case of the **European fusion programme** where Euratom provides much less than half the funding of the participating laboratories, but is able to ensure strong coordination of their efforts: (a) national funding agencies accept a limitation of their independence by allowing the scientific assessment of the programme and proposals for its evolution to be done collectively by representatives of Euratom associated laboratories and Member States with strong input by the Commission; (b) all the significant fusion facilities have been built with financial support from Euratom, which requires that their operation be open to researchers from all the Association laboratories; (c) smaller associations can concentrate on scientific topics or subsystems for any device in Europe and make important contributions while still maintaining the visibility of their own identity; (d) in addition to formal training activities, the extensive exchanges of personnel between the Associations ensure a Europe wide dissemination of expertise; (e) in some cases the management of the programme of the facilities is shared with the other participating Associations.

Structuring effects of technology platforms / technical forums in fission R&D: All major stakeholders in fission and radiation protection research are now grouped in technical forums: SNETP, IGDTP and MELODI, thereby promoting strategic planning, sharing resources and even joint programming, with a strong participation of industry in the two former forums.

e) Action at European level (Euratom) can take on high risk, high cost, long-term programmes beyond the reach of individual Member States, **sharing the risk and generating a breadth of scope and economies of scale** that could not otherwise be achieved.

The scientific and technological feasibility of fusion will be demonstrated by ITER. This has to be done at very large scale and cannot be broken down into smaller projects that could be handled at national level. On this scale it is necessary to pool financial resources and scientific expertise, and to share risk, in an international cooperation. Together the 7 international partners (EU plus China, India, USA, Korea, Russia, Japan) will prove the feasibility of fusion as an energy source, and Europe as host will obtain the largest share of the economic and scientific benefits.

Another example is the Joint European Torus (JET) the world's leading fusion experiment, with a volume of fusion plasma about 10 times larger than that in any other fusion device, and a configuration and performance closer to that of ITER than any other device. The total expenditure for construction, upgrade and exploitation of this European facility during 1978-2010 amounts to ca. 2000 Million EUR. The majority of this funding has come from the Community budget, but there has also been strong support from the Member States. In particular, the construction and operation of JET has only been possible because of the pooling of scientific and industrial expertise from all the Member States. The contributions of JET to the development of fusion must not be underestimated: (a) it is the only current fusion device which can operate with the fuel mixture of genuine fusion reactors; (b) it holds all the records for peak and sustained production of controlled fusion power; (c) it is the most ITER relevant machine for studies in preparation for ITER technology and operations; (d) it is the only present fusion device in which the essential fusion technology of remote handling has been developed and used for major interventions; (e) it is the most useful experiment for the training of future operational staff for ITER.

The High Performance Computer for Fusion (HPC-FF) is a valuable new tool for the fusion programme. Fusion modelling requires powerful computer resources; increasingly realistic simulations that are able to take into account the full ITER plasma will be an essential tool for the safe and efficient operation of ITER. The HPC-FF computer, hosted and operated by the Jülich Supercomputing Centre at the Forschungszentrum Jülich fusion Association in Germany, is among the 30 most powerful computers in the world. Euratom capital investment amounted to around €7.4 million, while the total budget including the capital investment and exploitation over four years will be around €16.8 million, with contributions from the entire European fusion community.

f) Action at European level (Euratom) can help give credibility to the EU's long-range policies on energy and **increase the willingness of investors to release capital for projects with particular importance for nuclear safety or with long lead-times** and **significant technology and market risk.**

Project SARNET-2 is an excellent example of the leverage effect of EU funding – the total budget is €38M but the EU contribution is just €5.75M (i.e. 16% of total costs). The project will continue the efforts of a number of European R&D organisations, including safety authorities, industry and universities, to network their research capacities in the area of severe reactor accidents, thus enhancing the safety of existing and future nuclear power plants. This Network of Excellence defines joint research programmes and develops common computer tools and methodologies for safety assessment of nuclear power plants, and ultimately ensures sustainable integration of the key R&D organisations in this sector.

European Sustainable Nuclear Industrial Initiative (ESNII) constitutes one of the three technology pillars of SNETP and is moving forward with the design and construction of three fast reactor technologies of the next generation (Gen-IV). Euratom is co-funding cross-cutting topics and pre-commercial research, though national public and private investors will probably be responsible for funding construction of the demonstrator plants (ASTRID, MYRRHA and ALLEGRO).

The closer involvement of industry in fusion development has been launched by the establishment of the **Fusion-Industry Innovation Forum**. It will have an increased role in during future EU research programmes, especially in relation to preparation for the construction of DEMO. As well as providing the foundations for creating a strong fusion industry in the future, in the short term it will promote technology transfer and dissemination in order to maximise innovation.

g) In international cooperation, it makes it easier for our international partners to interact with a **single interlocutor** and build common actions.

In all matters concerning **ITER and the Broader Approach**, Euratom is the signatory of the agreements, and the Commission is the sole interlocutor for matters of governance. This is essential for such complex international projects. The Commission has also taken the responsibility for establishing **bilateral agreements with third countries** (especially the ITER partners), which provide an umbrella under which collaborative research of mutual benefit can take place with standardised provisions on, for example, intellectual property matters.

The Generation-IV International Forum (GIF) is fostering multilateral cooperation in research on next generation nuclear technology. Euratom and all major civil nuclear power programme countries are cooperating though the exchange of results on pre-conceptual design research on six advanced systems. All research stakeholders in Europe can benefit from Euratom membership of GIF, in particular by being a partner in a relevant Euratom FP project. The dialogue in the GIF is also helping to establish future partnerships for design and construction of demonstrator plants.

2.6. EU performance in nuclear research - comparison with USA and Japan

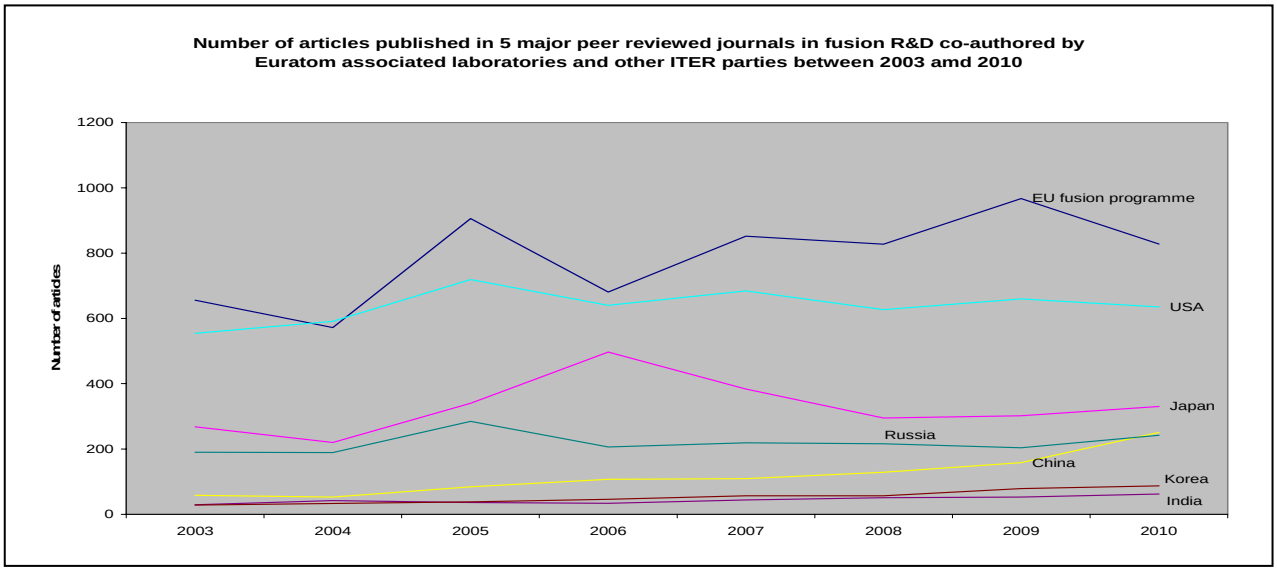
Fusion: Overall, the EU (Member States and Euratom) devotes the largest worldwide budget to fusion research (see table below) and dominates fusion science and technology.

Annual budgets for fusion energy research *estimates in million Euro,*					
	2007	**2008**	**2009**	**2010**	**2011**
EURATOM (1) (including ITER)	271.8	295.9	388.7	438.9	438.0
EU Member States (1)	310.8	311.4	About 300 million euro / year		
Total for Europe (1)	582.6	607.3	About 700 million euro / year		
USA(2)	232.2	215.1	355.4	321.3	307.5
Japan (2) (3)	115.9	150.5	152.7	N/A	N/A

Sources: European Commission, US Department of Energy, IEA
(1) Magnetic confinement R&D only
(2) Includes Magnetic confinement R&D and inertial confinement
(3) May not include all administrative and running costs.

Analysis of peer reviewed journals and citations show a strong leadership of the Europe in fusion R&D. **Europe through its fusion laboratories co-authored the largest number of articles published during the period 2003-10** in five international peer reviewed journals in the field of plasma physics and fusion[xxxiv], with an **average number close to 800 articles per year** (see figure below).

Europe's leadership in fusion is further underlined by the fact that **436 of most cited 1000 articles** published in these 5 journals were prepared on the basis of research co-funded by Euratom. **On average each of these 436 articles resulted in 25 citations** (similar to USA, 26, and better than Japan, 21) with the **best article yielding 141 citations.**



Source: Calculated on the basis of Scopus.com

Some countries like Russia and USA have fusion R&D programmes well established since the 1950s, while others such as China, Korea and India have developed more recently (1990s-2000s) in parallel to intensification of the ITER programme. All the ITER partners are pursuing the tokamak approach, but none have facilities comparable to JET. The rate of progression of Asia is fast and impressive and Europe will have to adapt its effort to this evolving situation in order to benefit from its past investments.

Fission: Recent data indicate that Europe spends less on fission R&D than USA and Japan (assuming that expenditure in 2009-2011 has remained at the 2008 level in the table below). The European R&D sector in fission is dominated by France and covers a wide range of activities in all relevant areas, though is particular strong in nuclear safety, geological disposal and radiation protection. Regarding research in advanced systems, the situation is less favourable, even despite projects such as ASTRID and MYRRHA. Annual figures collected by the Generation-IV International Forum (GIF, unpublished) show that Europe is investing similar amounts in pre-conceptual design research on advanced systems as other GIF members, but that Asia is much further advanced regarding development of demonstrator reactors, with high temperature reactors and sodium cooled fast reactors under construction in China, India and Japan, and Russia also advancing rapidly. These countries are also dominating the market for new build of current nuclear technology.

Annual budgets for research in fission and radiation protection
In million EUR

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
(1) Euratom budget	49.5	53.1	48.7	49.5	51.7	51.0	52.0
(2) EU Member States	598.8	577.6	585.9	514.0	N/A	N/A	N/A
Europe. Total (1+2)	648.3	630.7	634.6	563.5	N/A	N/A	N/A
USA	379.7	288.0	394.2	489.2	560.7	593.4	N/A
Japan	1981.6	1861.8	1880.4	1868.1	1835.5	N/A	N/A

Source: European Commission. IEA. US Department of Energy

IEA database is incomplete and does not cover all Member States (see footnote no. 33)

Europe's performance in the area of nuclear fission R&D can be measured in patents registered in the European Patent Office[xxxv]. For the period 1990-2008, the European industry and research sector (from 27 Member States) has been granted about 1164 patents (51% of all registered by EPO) in the field of nuclear reactors and nuclear power plants. Other major players are USA and Japan (37% and 11% respectively).

However, the majority of these patent applications concern current not future reactor systems. Without continued efforts in Nuclear Research and Innovation, ranging from present reactors to Generation III and IV, the EU will quickly loose its technological leadership since in other parts of the word, advanced reactor systems are under construction or already in operation.

3. Objectives for the future Euratom Research and Training Programme

In order to tackle the problems identified in section 2, it is important to clarify the objectives of Euratom's actions in the field of nuclear research and training.

The overall objective of the Euratom Research and Training Programme (2014-2018) will be to improve nuclear safety, security and radiation protection, and to contribute to the long term decarbonisation of the energy system in a safe, efficient and secure way. This shall reinforce the three objectives of "Horizon 2020" programme: strengthening excellence in the science base; creating industrial leadership and competitive frameworks; tackling societal challenges.

For the attainment of its objective the Euratom Programme shall strengthen the research and innovation framework in the nuclear field and coordinate Member States' research efforts, thereby avoiding duplication, retaining critical mass in key areas and ensuring that public funding is used in an optimal way. The Programme shall continue to promote the European Research Area and the further integration of new Member States and associated countries.

While it is for each Member State to choose whether or not to make use of nuclear power, the role of the Union is to develop, in the interest of all its Member States, a framework for supporting cutting-edge research on nuclear fission technologies, with special emphasis on safety, security, radiation protection and non-proliferation. In order to maintain the Union's nuclear expertise, the Programme shall further enhance its role in training.

The Commission proposed in a communication "A Budget for Europe 2020" (COM(2011) 500) that for projects such as ITER, where the costs and/or the cost overruns are too large to be borne only by the EU budget, the funding should come from outside the MFF after 2013. This will enable the EU to continue to fully meet its international commitments. Therefore ITER construction and related activities are not subject of the Euratom Research and Training Programme and a separate proposal for a supplementary research programme for ITER construction will be prepared.

In order to achieve the overall objective, the following specific objectives must be attained by **indirect actions:**

a) Support safe operation of nuclear systems;

Research to underpin the safe operation of reactor systems (including fuel cycle facilities) in use in Europe or, to the extent necessary in order to maintain broad nuclear safety expertise in Europe, those reactor types which may be used in the future, focusing exclusively on safety aspects, including all aspects of the fuel cycle such as partitioning and transmutation.

b) Contribute to the development of solutions for the management of ultimate waste;

Research activities on remaining key aspects of geological disposal of spent fuel and long-lived radioactive waste with, as appropriate, demonstration of the technologies and safety, and to underpin development of a common European view on the main issues related to waste management from discharge of fuel to disposal. Research activities related to management of other radioactive waste streams for which industrially mature processes currently do not exist.

c) Develop and maintain nuclear competences;

Promote training and mobility activities between research centres and industry, and support maintaining nuclear competences in order to guarantee the availability of suitably qualified researchers, engineers and employees in the nuclear sector over the longer term.

d) Foster radiation protection

Research will focus in particular on the risks from low doses (from industrial, medical or environmental exposure) and on emergency management in relation to accidents involving radiation, to provide a scientific basis for a robust, equitable and socially acceptable system of protection.

e) Move toward demonstration of feasibility of fusion as a power source by exploiting existing and future fusion facilities

Support common research activities undertaken by members of the European Fusion Development Agreement to ensure the rapid start up of high performance operation of ITER including inter alia, the use of relevant facilities (including JET), integrated modelling using high performance computers, plus training activities to prepare the ITER generation of researchers and engineers.

f) Laying the foundations for future fusion power plants

Support for joint activities undertaken by members of the European Fusion Development Agreement to develop and qualify materials for a demonstration power plant requiring, inter alia, preparatory work for an appropriate material test facility and negotiations for the Union's participation in a suitable international framework for this facility.

Support for joint research activities undertaken by members of the European Fusion Development Agreement that shall address reactor operation issues and shall develop and demonstrate all relevant technologies for a fusion demonstration power plant. Activities include preparation of complete demonstration power plant conceptual design(s) and exploration of the potential of stellarators as a power plant technology.

g) Promote innovation and EU industry competitiveness

Implement or support a knowledge management and technology transfer from the research co-funded by this programme, including ITER, to industry exploiting all innovative aspects of the research. For the longer term, the Programme shall support the preparation and enhancement of a competitive nuclear industry, in particular for fusion through the implementation of a technology road map to a fusion power plant with active industrial involvement in the design and development projects.

h) Ensure availability of research infrastructures

Support construction, the use and continued availability of, appropriate access to, and cooperation between key research infrastructures within the scope of Euratom programme.

Direct actions by the Joint Research Centre will contribute to the Euratom Programme's overall objective by attaining the following specific objectives:

a) Improve nuclear safety including: fuel and reactor safety, waste management and decommission; and emergency preparedness;

b) Improve nuclear security including: nuclear safeguards, non-proliferation, combating illicit trafficking and nuclear forensics;

c) Raise excellence in science base for standardization;

d) Foster knowledge management, education and training

e) Support EU policy and legislation on nuclear safety and security

4. POLICY OPTIONS

The Euratom Research and Training Programme is an integral part of the Commission proposal for 'Horizon 2020' the Framework Programme for Research and Innovation. Therefore an analysis of general policy options presented in the main report on the impact assessment for the 'Horizon 2020' apply also to the Euratom Programme.

The following section provides a supplementary information and analysis of policy options (scenarios) for the fusion research programme.

Scenario 1 aims at the shortest path to demonstrate electricity production from a DEMO fusion reactor by 2040;

Scenario 2 takes full benefit of ITER exploitation but with a slower rate of progress on power plant related activities;

Scenario 3 curtails the research programme, delaying DEMO by more than 10 years and compromising the capability of EU industry to become a main actor in the eventual worldwide fusion energy market.

Evaluation of these scenarios is supplemented by the analysis of risks and benefits of fusion research.

5. ANALYSING THE IMPACTS AND COMPARING OPTIONS

5.1. Analysis of scenarios for fusion research

Given the potential of fusion to satisfy future energy requirements and assuming that it will have to take as soon as possible a substantial share of base-load electricity production in the future, it is appropriate to consider reaching the ultimate objective as quickly as possible with a **first scenario** requiring an increased level of activities and resources. This scenario assumes that an ambitious programme should be put in place to have fusion energy electricity in the grid from a demonstration reactor by 2040 and prototype power plants available by 2050. In-depth assessments by the fusion community have shown that this scenario requires the completion of the ITER construction and achievement of first plasma by 2020, followed by the start of Deuterium and Tritium operation by 2027. DEMO design by industry supported by the fusion community should start as soon as scientific results, materials and engineering data are available from ITER exploitation and from other complementary activities, probably a little before 2030. In addition to the present spectrum of research activities, the early implementation of two other projects with long lead-times is essential if such a rate of progress is to be achieved: the development and testing of "Tritium Breeding Modules" for tritium self-sufficient operation of fusion reactors (a TBM programme was established by the ITER Council in 2009 and TBMs will be tritium-tested in the ITER facility from 2027); and preparation for an ad-hoc fusion specific neutron source so that its construction could start by 2020. The first scenario would require a re-evaluation of current funding schemes and structure of the research programme in Europe and the way it is implemented, especially in order to favour more rapid industrial take-up of the technology

Pros: Demonstrating fusion energy potential to produce electricity by 2040 and putting power plants in the grid by 2050, maintaining EU leadership and optimally positioning EU industry to exploit the commercial potential.

Cons: High cost scenario during the period until 2020.

A second scenario assumes that fusion is less urgently needed to complement/substitute other energy sources. It partially omits / postpones some activities and generally has a lower level of activity during the period 2014-2020, postponing a number of developments beyond 2020 and implying acceptance of a longer timescale. As in first scenario, reassessment of the Euratom funding approach is necessary.

Pros: A level of activities maintaining the overall goal of the research programme, at an average cost until 2020 that may be comparable to the average level in FP7.

Cons: Higher risk than in the first scenario and the pace may be slowed down depending on capacity to address scientific/technical/industrial issues during development, and likely higher total cost to reach the ultimate objective owing to delays.

A third scenario implies a severe curtailment and/or postponement of R&D activities including for ITER systems (e.g. for heating systems, Test Blanket Modules) with the consequent risks and likelihood of delays in ITER construction and a slow start of its operation. In this scenario the EU fusion programme would essentially consist of the EU contribution (subject to separate decision) to the (likely delayed) ITER project accompanied by limited other fusion activities. The EU, which is the major contributor to the ITER project, would not reap the full benefits of its investment and the exploitation of the ITER facility would mainly benefit our international competitors. In addition, the EU's progress towards DEMO and fusion energy would be substantially delayed.

It should be emphasised that the most important part (and corresponding cost) of Europe's efforts to establish feasibility of fusion as a power source during the period covered by the 'Horizon 2020' will be, by far, the EU contribution to ITER construction (subject to separate decision on supplementary research programme). It appears therefore sound, subject to the availability and distribution of resources under Horizon 2020, to opt for the first scenario in order to have fusion energy available as soon as possible.

5.2. Where are the risks and benefits of future EU investments in nuclear research?

The main benefit of the fusion research is, in a very long term, to provide solutions for development of fusion as a viable alternative for a large scale and low carbon base-load energy source. The fusion programme proposed for 2014-18 will bring the following specific benefits:

- **Efficient operation of ITER:** the R&D programme will expand the existing knowledge and prepare staff to ensure that Europe will have the human resources to exploit ITER in an international and competitive environment;
- **Acceleration of development of fusion power plants –** in parallel to R&D for ITER, the programme will lay the foundations for fusion power plants by driving forward the significant physics and technology developments that are required.
- **Contribution to the EU competitiveness** – the body of expertise created in by the fusion research community, will provide immediate technology transfer benefits for industry and services[xxxvi].
- **Spin-off benefits of fusion research** – besides the promise of bringing sustainable energy supply in the future, fusion R&D is yielding additional societal benefits which should be taken into account in the allocation of public R&D funds[xxxvii]. Fusion research has pushed many of the cutting-edge technologies to new limits and in many cases innovative solutions to challenging problems have found applications far beyond the bounds of fusion (cooled high heat flux components in space applications, improvement of Magnetic Resonance Imaging (MRI), applications in brakes and clutches used in trains and motor racing)[xxxviii].
- **Reduction of risks regarding future exploitation of fusion energy** – research can further reduce economic, environmental and social risks (see table on the risks and benefits of fusion).

The main risk for fusion research is that it is still at the experimental stage and it may fail to deliver results i.e. demonstrate the feasibility of fusion as an energy source**.** Such a failure will result in economic loss in term of investments made and lost opportunities for using resources for other purposes.

5.3. Risks and benefits of fusion energy

The table below shows possible benefits and risks related to the eventual exploitation of fusion energy (summary of assessments made in numerous peer review journals and studies).

Risks and benefits of fusion energy	
Benefits	
Economic	– The scale and sustainability of fusion energy production will not be limited by fuels (deuterium and tritium) – High energy density and no major land use; – Possible source of stable base-load energy supply – Preliminary analyses based on set of assumptions indicate competitive costs of electricity from fusion
Environmental	– no CO_2 emissions from fusion operations, very low carbon emissions for the whole life-cycle; – The maximum radiological doses to the public arising from the most severe conceivable accident driven by in-plant energies would be well below the level at which evacuation would be considered and would be comparable to typical annual doses from natural causes. – After a few decades, the total radiotoxic potential of the activated material arising from the operation and decommissioning of the fusion plant will have decreased to a low value. All of this material, after remaining in situ for a few decades, may, if desired, be cleared or recycled, with little, or no, need for repository disposal. – No possibility for runaway reactions or meltdown, and much smaller quantities of highly radioactive material than in fission reactor. A Fukushima-type melt-down accident cannot happen in a fusion reactor. – Fusion has significant proliferation advantages compared to fission. Any illicit use of fusion neutrons for transmutation to produce fissionable materials would be easily detectable.
Social	– Important domestic added value (European technological leadership) – Negligible human health impacts
Risks	
Economic	– Fusion's role in the energy mix is very sensitive to the costs – Availability factor for future power plant – Fusion will be able to enter the market in the second half of the century if environmental constraints are applied consistent with a maximum atmospheric CO_2 concentration in the range of 550 to 650 ppm.
Environmental	The main nuclear risk associated with fusion is the use of tritium as fuel
Social	Need to teach society about new source of energy
Sources*: Final Report of the European Fusion Power Plant Conceptual Study (PPCS)* EFDA 2005; *Study on safety and environmental impact of fusion*, EUR (01) CCE-FU / FTC 8/5, EFDA April 2001; *Power plant conceptual studies in Europe*, D. Maisonnier, D. Campbell, I. Cook, Nucl. Fusion 47 (2007) 1524–1532; *Revised assessments of the economics of fusion power*, W.E. Han, D.J. Ward / Fusion Engineering and Design 84 (2009) 895–898, *Economically competitive fusion*, David J. Ward and Sergei L. Dudarev, December 2008, Materials Today, Vol. 11, No 12,	

6. EVALUATION AND MONITORING

To achieve the objectives set out in Section 3 it is vital to put in place an appropriate system for Euratom's programme evaluation and monitoring. The Euratom programme will follow key principles for the evaluation and monitoring presented in chapter 6 of the main report of the impact assessment of "Horizon 2020" Framework Programme for Research and Innovation.

To monitor progress specific indicators. Separate for direct and indirect actions, will be used.

6.1. Indicators for indirect actions

a) Support safe operation of nuclear systems;

Indicator: Percentage of overall programme funding going on projects likely to lead to a demonstrable improvement in nuclear safety practice in Europe.

Current: XX% (2011); Target: XX% (2018) *Data for this indicator will be provided later*

b) Contribute to the development of solutions for the management of ultimate waste;

Indicator: Number of geological repositories for spent nuclear fuel and/or high-level waste that are planned in Europe and for which a *safety case* has been prepared and construction application made.

Current: 0 (2011); Target: 3 (2018),

c) Develop and maintain nuclear competences;

Indicator: Training through research - number of PhD students and Post-Doc researchers involved in Euratom fission projects

Current: ca. 200 (total for 2006-2011); Target: 300 (total for 2014-2018)

Indicator: Number of fellows and trainees in the fusion programme

Current: on average 27 per year (2011); Target: 40 per year (2018)

d) Foster radiation protection

Indicator: Percentage of funding going on projects likely to have a demonstrable impact on regulatory practice regarding radiation protection.

Current: XX% (2011); Target: XX% (2018) *Data for this indicator will be provided later*

e) Move toward demonstration and feasibility of fusion as a power source by exploiting existing and future fusion facilities

Indicator: Number of publications in high impact journals

Current: ca. 800 (2010); Target: Maintain current levels (2018).

Description of the indicator: Source of data – Scopus database. Please note that with the fusion programme's emphasis shifting from research to technology development this indicator may be lower in the future. Indicator concerns articles where at least one contributing author is from the European fusion laboratory participating in the Euratom Programme. It is calculated on the basis of 5 most important international peer reviewed journals in the field of plasma physics and fusion: *Nuclear Fusion, Plasma Physics and Controlled Fusion, Fusion Engineering and Design, Fusion Science and Technology, Journal of Fusion Energy*.

f) Lay the foundations for future fusion power plants by developing materials, technologies and conceptual design;

Indicator: Percentage of the Fusion Roadmap's milestones established for a period 2014-2018 reached by the Euratom Programme;

Current: new indicator, 0%

Target: 90%, including Report on Fusion Power Plant Conceptual design activities (2018);

Description of the indicator: new indicator which will be based on the roadmap for the fusion programme to be developed before 2014.

g) Boost Europe's industrial leadership in fusion technologies through development of the technology transfer process

Indicator: Number of spin-offs from the fusion research under Euratom Programme

Current: 33% of contracts resulted in spinoffs (2011); Target: 50% (2018)

Description of the indicator: new products or services developed by companies involved in the fusion research.

Indicator: Patents applications generated by European fusion laboratories

Current: 2-3 new patents per year (2011); Target: on average 4-5 new patents per year (2018);

h) Ensure availability of research infrastructures for nuclear research;

Indicator: Number of researchers using fusion research infrastructures through mobility support

Current: ca. 800 (2008), Target: 1200 (2018);

Description of the indicator: mobility scheme under fusion programme supports short term visits of European scientists to the fusion facilities such as JET.

6.2. Indicators for direct actions

a) Improve nuclear safety including, fuel and reactor safety, waste management and decommissioning; and emergency preparedness

Indicator: Scientific Productivity (Number of major JRC annual work programme deliverables: reports and publications to support nuclear fuel and reactor safety, waste management, decommissioning and emergency preparedness)

Current: 45 (2010); Target: 50 (2018)

b) Improve nuclear security including: nuclear safeguards, non-proliferation, combating illicit trafficking and nuclear forensics

Indicator: Scientific Productivity (Number of major JRC annual work programme deliverables: reports and publications to support nuclear safeguards, non-proliferation, combating illicit trafficking and nuclear forensics)

Current: 15 (2010); Target: 20 (2018)

c) Raising excellence in nuclear science base for standardisation

Indicator: Scientific Productivity (Number of major JRC annual work programme deliverables: reports and publications to support EU standardisation.

Current: 30 (2010); Target: 30 (2018)

d) Foster knowledge management, education and training

Indicator: Scientific Productivity (Number of major JRC annual work programme deliverables: reports and training programmes)

Current: 20 (2010); Target: 18(2018)

e) Support to EU policy and evolving legislation on nuclear safety and security

Indicator: Policy support impact (Number of JRC reports used as reference for EU legislation)

Current: 0 (2010); Target: 2 (2018)

Indicator: Policy support productivity (Number of major JRC annual work plan deliverables with tangible impact at the level of nuclear policy makers: reports and training programmes)

Current: 40 (2010); Target: 45(2018)

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i Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Netherlands, Romania, Slovakia, Slovenia, Spain, Sweden, UK

ii Prospects for fusion, C. H. Llewellyn Smith, *Nuclear Physics* 751 (2005) 442c–452c; See also The Sustainable Nuclear Energy Technology Platform – A vision Report http://www.snetp.eu/

31bis Final Report of the European Fusion Power Plant Conceptual Study (PPCS), EFDA 2005

iii http://www.iaea.org/newscenter/focus/fukushima/

iv http://ec.europa.eu/energy/nuclear/safety/stress_tests_en.htm

v Strategic Research Agenda of the Sustainable Nuclear Energy Technology Platform, SNETP 2010

vi Proposal for a Council Directive on the management of spent fuel and radioactive waste, COM(2010)618, 3 November 2010

vii Special Eurobarometer 297: *Attitudes towards radioactive waste*, published in June 2008.

viii See for example: http://ec.europa.eu/research/energy/pdf/euradwaste_08_en.pdf and 'Radioactive waste in perspective', NEA2010

ix Vision Report of the Implementing Geological Disposal of Radioactive Waste Technology Platform, 2010 http://www.igdtp.eu/

x Nuclear education and training: cause for concern? OECD NEA 2000

xi The need for nuclear education culture have been underlined by the Council of the European Union – see conclusions on the need for skills in the nuclear field, 2891st Competitiveness (Internal Market, Industry and Research) Council meeting, Brussels, 1 and 2 December 2008

xii Uranium 2009: Resources, Production and Demand ('Red Book'); OECD, IAEA, August 2010

xiii Assessment of Nuclear Energy Systems Based on a Closed Nuclear Fuel Cycle with Fast Reactors, IAEA, 2010

xiv Generation-IV International Forum 2009 Annual Report (published by the OECD Nuclear Energy Agency) http://www.gen-4.org/PDFs/GIF-2009-Annual-Report.pdf

xv Report of the High Level and Expert Group on European Low Dose Risk Research, Jan. 2009 (http://www.hleg.de/fr.pdf)

xvi R&D Investment in the Priority Technologies of the European Strategic Energy Technology Plan, JRC 2007

xvii http://iri.jrc.ec.europa.eu/research/scoreboard_2010.htm

xviii AREVA, EdF, Vatenfall, Iberdola, EnBW Energie Baden-Wurttemberg, Fortum, CEZ, URENCO

xix Some corporate reports indicate that corporate research priorities cover to some extent the challenges indicated in section 1, in particular: lifetime plant management, improvement of fuel utilisation, development of new LWR reactors (generation III) and waste management. Some companies have also indicated investments in the front and back end of the nuclear fuel cycle. Prepared on the basis of the latest version of annual reports from the following companies: AREVA, EdF, Vatenfall, Fortum

xx Sixth Situation Report on Radioactive Waste and Spent Fuel Management in the European Union, COM(2008)542 final and SEC(2008)2416

xxi http://www.gen-4.org/

xxii The scientific success of JET, M. Keilhacker *et al* 2001 *Nucear Fusion* 41 1925

xxiii Article 24 of the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project, Official Journal of the European Union, L 352762, 16 December 2006

xxiv Commission's survey (2009) of companies involved in upgrade and construction projects in fusion

xxv Data from http://wds.iea.org

xxvi This estimate is based on IEA data available for some Member States only (Austria (2000-2008), Belgium (2007 only), Czech Republic (2003-2007), Denmark (2000-2007), Finland (2000-2008), France (2000-2008), Germany (2000-2009), Hungary (2000-2009), Italy (2000-2007), Netherlands (2000-2003, 2005-6), Slovak Republic (2002-2004, 2008-9), Spain (2000-2006), Sweden (2003-2009),

xxvii R&D Investment in the Priority Technologies of the European Strategic Energy Technology Plan, JRC 2009

[xxviii] For more details see http://ec.europa.eu/research/energy/euratom/fusion/eu-fusion/index_en.htm, also http://www.efda.org/

[xxix] Source: European Commission

[xxx] http://eur-lex.europa.eu/en/treaties/index.htm

[xxxi] This is the focus of the NULIFE project (nulife.vtt.fi) and related projects– the NULIFE, when created, will be able to provide a service for industry which will ensure common standards.

[xxxii] See for example conclusions of the Interim Evaluation of Euratom 7th Framework Programme http://ec.europa.eu/research/evaluations/index_en.cfm?pg=fp7-evidence

[xxxiii] information available on http://www.irsn.fr/

[xxxiv] Journals analysed in Scopus database (www.scopus.com): Nuclear Fusion, Plasma Physics and Controlled Fusion, Fusion Engineering and Design, Fusion Science and Technology, Journal of Fusion Energy.

[xxxv] Calculated on the basis of data from Eurostat

[xxxvi] For details see http://ec.europa.eu/research/energy/pdf/200905_fusion_industry.pdf

[xxxvii] Estimating Spillover Benefits and Social Rate of Return of Fusion Research, Development, Demonstration and Deployment Program, EFDA Socio-Economic Research on Fusion, Edgard GNANSOUNOU, Denis BEDNYAGIN, EPFL, Switzerland, 2007

[xxxviii] For details see http://ec.europa.eu/research/energy/pdf/spin_off_en.pdf

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IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

Annexes

Annex 7: General Bibliography

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ANNEX 7: GENERAL BIBLIOGRAPHY

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COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

Annexes

Annex 8: Glossary

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ANNEX 8: GLOSSARY

Applied research: Original investigation undertaken in order to acquire new knowledge. Contrary to *basic research*, it is directed primarily towards a specific practical aim. The results of applied research are intended to be valid for a single or limited number of products etc. The knowledge or information derived from it is often patented but may also be kept secret.

Basic research: Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view (contrary to *applied research)*. The results of basic research are not generally sold but are usually published in scientific journals. Basic research can be split into two categories: 1) Pure basic research which is carried out for the advancement of knowledge, with no positive efforts being made to apply the results to practical problems. 2) Oriented basic research which is carried out with the expectation that it will produce a broad base of knowledge likely to form the background to the solution of recognised or expected current or future problems or possibilities.

Business As Usual (BAU): In this scenario, the main existing EU sources of funding for research and innovation – the FP, the innovation-related part of the CIP, and the EIT – are simply carried forward into the next Multi-annual Financial Framework as separate instruments, with separate objectives, and in their current formats. In the Business As Usual+ (BAU+) scenario, the FP, the innovation-related part of the CIP, and the EIT remain separate instruments and retain their current formats. However They are put together under a 'common roof', and loose coordination mechanisms are established between them and their objectives are loosely aligned. In addition, the implementing modalities of each individual programme and initiative are simplified. No single set of simplified rules applies across the three programmes.

BRIC-countries: Brazil, Russia, India and China.

Collaborative Projects: Support to Framework Programm funded research projects carried out by consortia with participants from different countries. The size, scope and internal organisation of projects can vary from field to field and from topic to topic. Projects can range from small or medium-scale focused research actions to larger integrating projects which mobilise a significant volume or resources for achieving a defined objective.

Competitiveness and Innovation Framework Programme (CIP): The Competitiveness and Innovation Framework Programme (CIP) supports innovation activities (including eco-innovation), provides better access to finance and delivers business support services in the regions, targetting mainly small and medium-sized enterprises (SMEs).

Common Research Data Warehouse (CORDA): CORDA and E-CORDA (External Common Research Data Warehouse – the analogue destined to external stakeholders) are databases containing data on applicants/proposals and signed grants/beneficiaries with regards to a specific Framework Programme for Research. CORDA is refreshed daily with data coming from a wide variety of systems and applications. It, therefore, contains almost up-to-date information on Framework Programme activities. E-CORDA is a 'snapshot' of CORDA extracted semi-annually, the data of which undergoes further quality controls and interpretation.

CORDIS: The Community Research and Development Information System (CORDIS) is a huge internet information system comprising information on past and on-going projects, calls for proposals, partner search facilities, an electronic proposal submission system (EPSS) and other features.

COST: An intergovernmental framework for European co-operation in the field of S&T, allowing the co-ordination of nationally funded research on a European level. COST actions cover basic and pre-competitive research as well as activities of public utility.

CREST: The Scientific and Technical Research Committee (CREST), composed of representatives of Member States, is a high level advisory board to the Commission and the Council in the field of RTD.

Development of a European Multi-model ensemble system for seasonal to inter-annual prediction (DEMETER): This EU-funded project entitled aims to develop a well-validated European coupled multi-model ensemble forecast system for reliable seasonal to interannual prediction. A fundamental aspect is to establish the practical utility of such a system, particularly to the agriculture and health sectors.

Entrepreneurship and Innovation Programme (EIP): The EIP is one of the specific programmes under the CIP, supporting innovation and SMEs in the EU. It focuses on access to finance for SMEs, business services (Entreprise Europe Network), support for improving innovation policy, eco-innovation, as well as support for innovation and SME policy-making through contracts and grants.

ERA-NET: The principal means for the FP to support the co-ordination of national and regional research programmes.

EU-12: The 12 countries that joined the EU since 2004 (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia).

EU-15: Before 1 May 2004, the European Union consisted of 15 Member States (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and United Kingdom).

EURATOM: The European Atomic Energy Community (EURATOM) is one of the building blocks of the EU. In relation to Community research policy, the EC Framework Programme is complemented by an EURATOM Framework Programme under the Euratom Treaty which covers training and research activities in the nuclear sector.

EUREKA: A pan-European network for market-oriented, industrial R&D. EUREKA supports the competitiveness of European companies through international collaboration, in creating links and networks of innovation. The objective is to bring high quality research and development efforts to the market and to use the multiplying effects of co-operation.

European Added Value (EAV): EU support to research and innovation is provided only when it can be more effective than national funding. It does this through measures to coordinate national funding, and through implementing collaborative research and mobility actions.

European Higher Education Area (EHEA): The EHEA was launched in March 2010, along with the Bologna Process' decade anniversary, during the Budapest-Vienna Ministerial Conference. As the main objective of the Bologna Process since its inception in 1999, the EHEA was created to ensure more comparable, compatible and coherent systems of higher education in Europe.

European Institute for Innovation and Technology (EIT): The EIT is an institute of the European Union established in March 2008, to increase European sustainable growth and competitiveness by reinforcing the innovation capacity of the Member States and the EU, by developing a new generation of innovators and entrepreneurs. The EIT has created integrated structures, Knowledge Innovation Communities (KICs), which link the higher education, research and business sectors to one another, boosting innovation and entrepreneurship. The KICs focus on priority topics with high societal impact.

European Patent Office (EPO): The European Patent Organisation is an intergovernmental organisation that was set up on 7 October 1977 on the basis of the European Patent Convention (EPC) signed in Munich in 1973. It has two bodies, the European Patent Office and the Administrative Council, which supervises the Office's activities.

European Research Area (ERA): A general concept proposed by the Commission and endorsed by the European Parliament and Council in 2001 to overcome the fragmentation of European research and innovation efforts. The concept comprises organising co-operation at different levels, co-ordinating national or European policies, networking teams and increasing the mobility of individuals and ideas.

European Research Council (ERC): Introduced in FP7, it will be the first pan-European funding agency for *frontier research*. Early stage as well as fully established investigators from across Europe will be able

to compete for grants with scientific excellence as the sole criterion for funding. The independent Scientific Council will direct the ERC's scientific operations and ensure that its support is in accordance with the highest standards of science and scholarship.

European Space Agency (ESA): Established in 1975, ESA is an inter-governmental organisation dedicated to the exploration of space, with 17 Member States. Its mission is to shape the development of Europe's space capability. By coordinating the financial and intellectual resources of its members, it can undertake programmes and activities far beyond the scope of any single European country.

European Strategy Forum on Research Infrastructures (ESFRI): ESFRI is a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach. The competitive and open access to high quality Research Infrastructures supports and benchmarks the quality of the activities of European scientists, and attracts the best researchers from around the world. The mission of ESFRI is to support a coherent and strategy-led approach to policy-making on research infrastructures in Europe, and to facilitate multilateral initiatives leading to the better use and development of research infrastructures, at EU and international level.

European Technology Platform (ETP): ETPs are industry-led stakeholder fora charged with defining research priorities in a broad range of technological areas. They provide a framework for stakeholders, led by industry, to define research priorities and action plans on a number of technological areas where achieving EU growth, competitiveness and sustainability requires major research and technological advances in the medium to long term. Some ETPs are loose networks that come together in annual meetings, but others are establishing legal structures with membership fees.

Framework Programme (FP): Since 1984, research and innovation activities of the EU are grouped in one big multiannual programme, the Framework Programme for Research and Technical Development. While FP1 to FP6 were conceived for a period of 4 years, FP7 is synchronised with the duration of the EU's financial perspective and covers the period 2007-2013. The FPs are elaborated and proposed by the Commission and have to be adopted by the European Parliament and the Council in co-decision.

Future and Emerging Technologies (FET): FET are the incubator and pathfinder for new ideas and themes for long-term research in the area of information and communication technologies, to promote high risk research, offset by potential breakthrough with high technological or societal impact.

Government Budget Appropriations or Outlays on R&D (GBAORD): All appropriations allocated to R&D in central government budgets. Data on government R&D appropriations therefore refer to budget provisions, not to actual expenditure, i.e. GBAORD measures government support for R&D using data collected from budgets.

Gross domestic expenditure on R&D (GERD): Total intramural expenditure on R&D performed on the national territory during a given period. GERD includes R&D performed within a country and funded from abroad but excludes payments made abroad for R&D.

Gross Domestic Product (GDP): This aggregate represents the result of the production activity of resident producer units. It corresponds to the economy's output of goods and services, less intermediate consumption, plus taxes linked to imports. The sum of the regional values of the GDP at market prices might differ from the national values for some countries.

Information and Communication Technologies (ICT): Information and Communication Technologies are critical to improve the competitiveness of European industry and to meet the demands of its society and economy.

Innovation (Oslo Manual): Both OECD and Eurostat refer to the Oslo Manual for measuring innovation, which identifies four types of innovation: product innovation, process innovation, marketing innovation and organisational innovation.

Institute for Prospective Technological Studies (IPTS): The Institute for Prospective Technological Studies is one of the seven scientific institutes of the European Commission's Joint Research Centre (JRC)**.** It promotes and enables a better understanding of the links between technology, economy and society. Its mission is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/ technological dimension.

Intellectual Property Rights (IPR): They cover all aspects of owning, protecting and giving access to knowledge and pre-existing know how.

Intelligent Energy Europe Programme (IEE): The Intelligent Energy - Europe programme is the EU's tool for funding action to save energy and encourage the use of renewable energy sources in Europe.

Intergovernmental Panel on Climate Change (IPCC): The IPCC is the leading international scientific body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.

International Thermonuclear Experimental Reactor (ITER): ITER is an international research and engineering project which is currently building the world's largest and most advanced experimental tokamak nuclear fusion reactor. The ITER project aims to make the transition from experimental studies of plasma physics to full-scale electricity-producing fusion power plants. The project is funded and run by seven members – the EU (which shares 45% of the cost), India, Japan, China, Russia, South Korea and the US (each sharing 9% of the cost).

Joint Research Centre (JRC): As a service of the European Commission, the mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. It functions as a reference centre of science and technology for the Union. The JRC has a network of research institutes in different member countries (Belgium, Germany, Italy, Netherlands, Spain). Its activities are financed by the Framework Programme via the direct actions.

Joint Technology Initiative (JTI): JTIs are a means to implement the Strategic Research Agendas (SRAs) of a limited number of European Technology Platforms (ETPs). In these few ETPs, the scale and scope of the objectives is such that loose co-ordination through ETPs and support through the regular instruments of the Framework Programme for Research and Development are not sufficient. Instead, effective implementation requires a dedicated mechanism that enables the necessary leadership and coordination to achieve the research objectives. To meet the needs of this small number of ETPs, the concept of Joint Technology Initiatives has been developed.

Key Emerging Technologies (KET): KETs are knowledge intensive and associated with high R&D intensity, rapid innovation cycles, high capital expenditure and highly-skilled employment. They enable process, goods and service innovation throughout the economy and are of systemic relevance. They are multidisciplinary, cutting across many technology areas with a trend towards convergence and integration. KETs can assist technology leaders in other fields to capitalise on their research efforts.

Marie-Curie Actions: The main objective of the FP's Marie Curie Actions is to strengthen training, the career prospects and mobility of European researchers in order to provide support for the development of world-class human resources.

Multi-annual Financial Framework (MFF): In order to improve the budgetary procedure, the European Parliament, the Council and the Commission conclude, since 1988, interinstitutional agreements covering the budget process and the distribution of the budget. These agreements are established for several years, and are also known as EU "Financial Perspective".

New Econometric Model for Environmental and Sustainable Development and Implementation Strategies (NEMESIS): The NEMESIS-model is a large-scale econometric model at the macro- and sectoral levels, which has been built by a Community funded *consortium* of European research institutes. It

comprises roughly 70 000 equations. The model can be used for several purposes, which include the assessment of structural (mainly R&D and environmental) policies, the study of the short- and medium-term consequences of a wide range of economic policies, short- and medium-term forecasting (up to 8 years) at the macro- and sectoral levels, and building long-term baseline scenarios (up to 30 years).

Open method of coordination (OMC): A relatively new and intergovernmental means of governance in the EU, based on the voluntary cooperation of Member States. It rests on soft law mechanisms such as guidelines and indicators, benchmarking and sharing of best practice, not on official sanctions for laggards. Rather, the method's effectiveness relies on a form of peer pressure and naming and shaming, as no Member States wants to be seen as the worst in a given policy area.

Organisation for Economic Development and Cooperation (OECD): The OECD is an international economic organisation of 34 countries founded in 1961 to stimulate economic progress and world trade. It is a forum of countries committed to democracy and the market economy, providing a platform to compare policy experiences, seek answers to common problems, identify good practices, and co-ordinate domestic and international policies of its members.

Patent Cooperation Treaty (PCT): The Patent Cooperation Treaty makes it possible to seek patent protection for an invention simultaneously in each of a large number of countries by filing an international patent application. Such an application may be filed by anyone who is a national or resident of a PCT contracting State. It may generally be filed with the national patent office of the contracting State of which the applicant is a national or resident or, at the applicant’s option, with the International Bureau of the World Intellectual Property Organisation in Geneva.

Peer review: The *evaluation* of proposals with the help of independent external experts (peers). For FP6, the procedures for the evaluation of proposals are described in detail in a Commission decision on 'Guidelines on proposal evaluation and selection procedures'.

Public Private Partnership (PPP): Public-private partnerships are forms of cooperation between public authorities and businesses, in general with the aim of carrying out infrastructure projects or providing services for the public. These arrangements have been developed in several areas of the public sector and within the EU are used in particular in the areas of transport, public buildings or environment.

Research and experimental development (R&D): R&D comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications. This term covers three activities: *basic research, applied research* and experimental development.

R&D intensity: Gross Domestic Expenditure on R&D (GERD) expressed as a percentage of Gross Domestic Product (GDP).

Risk-Sharing Finance Facility (RSFF): RSFF is an innovative scheme set up by the European Commission and the European Investment Bank to improve access to debt financing for private companies or public institutions promoting activities in the field of research and innovation.

Rules of Participation for the Framework Programme: They set out the framework that governs the relationship between the Commission and the institutions that participate in the programme, covering aspects such as procedures for calls for proposals, types of grants, levels of financing, consortia composition, the evaluation process, financial management of projects, and dissemination of project results. The Rules of Participation are adopted by the European Parliament and the Council in co-decision upon a proposal from the Commission (art. 167 TEC).

Small and medium-sized enterprises (SMEs): Enterprises having fewer than 250 employees and with either an annual turnover of no more than ECU 40 million or a balance sheet total of no more than ECU 27 million.

Stakeholder: Any person or organisation with an interest in or affected by EU legislation and policymaking is a 'stakeholder' in that process. The European Commission makes a point of consulting as wide a range of stakeholders as possible before proposing new legislation or new policy initiatives.

Strategic Energy Technology Plan (SET Plan): The SET plan, presented by the Commission, aims to help achieve European objectives and face up to the energy challenges, by increasing research to reduce costs and improve performance of existing technologies, and by encouraging the commercial implementation of these technologies in the short term, and in the longer term by supporting development of a new generation of low carbon technologies.

Technology Platforms: Introduced in FP7, they bring together companies, research institutions, the financial world and regulatory authorities at European level to define a common research agenda to mobilise a critical mass of - national and European – public and private resources.

Valley Of Death: The gap between basic knowledge generation and the subsequent commercialisation of knowledge in marketable products, is known in broad terms as the "valley of death" issue.

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Volume 1 - part 14/14

COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation';

Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);

Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

Annexes

Annex 9: List of Acronyms

{COM(2011) 808 final}
{SEC(2011) 1428 final}

ANNEX 9: LIST OF ACRONYMS

AGRI (DG)	European Commission Directorate General for Agriculture and Rural Development
BAU	Business As Usual
BRIC	Brazil, Russia, India and China
BUDG (DG)	European Commission Directorate General for Budget
CIP	Competitiveness and Innovation Framework Programme
CIP-PSP	CIP Policy Support Programme
CORDA	Common Research Data Warehouse
CSF	Common Strategic Framework for Research and Innovation
EAC (DG)	European Commission Directorate General for Education and Culture
EAV	European Added Value
ECFIN (DG)	European Commission Directorate General for Economic and Financial Affairs
EHEA	European Higher Education Area
EIB	European Investment Bank
EIP	Entrepreneurship and Innovation Programme
EIT	European Institute of Innovation and Technology
ENER (DG)	European Commission Directorate General for Energy
ENTR (DG)	European Commission Directorate General for Entreprise and Industry
ENV (DG)	European Commission Directorate General for the Environment
EPO	European Patent Office
ERA-NET	European Research Area network
ERC	European Research Council
ESFRI	European Strategy Forum on Research Infrastructures
ESTAT	Statistical Office of the European Union
ETP	European Technology Platform
EU12	The 12 countries that joined the European Union since 2004
EU15	The 15 countries that were members of the EU before the 2004 enlargement
EURATOM	European Atomic Energy Community
FET	Future and Emerging Technologies
FP	Framework Programme for Research and Technological Demonstration
GBOARD	Government Budget Appropriations or Outlays for Research and Development
GDP	Gross Domestic Product
IAB	Impact Assessment Board
IASG	Impact Assessment Steering Group
ICT	Information and Communication Technologies
IEE	Intelligent Energy Europe Programme
IPCC	Intergovernmental Panel on Climate Change
IPTS	Institute for Prospective Technological Studies (DG JRC)
ITER	International Thermonuclear Experimental Reactor
ITRE	European Parliament Committee on Industry, Research and Energy
JRC (DG)	European Commission Joint Research Centre
JTI	Joint Technology Initiative
KET	Key Emerging Technologies
MCA	Marie Curie Actions (DG EAC)
MFF	Multi-Annual Financial Framework
MOVE (DG)	European Commission Directorate General for Mobility and Transport
OECD	Organisation for Economic Development and Cooperation
OMC-NET	Open Method of Coordination network
PCT	Patent Cooperation Treaty
PPP	Public Private Partnership
R&D	Research and Development
REGIO (DG)	European Commission Directorate General for Regional Policy
RSFF	Risk-Sharing Finance Facility
S&T	Science and Technology
SANCO (DG)	European Commission Directorate General for Health and Consumers
SET Plan	Strategic Energy Technology Plan
SMEs	Small and Medim-sized Entreprises

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Volume 2 - part 2/2

COMMISSION STAFF WORKING PAPER

IMPACT ASSESSMENT

Accompanying the

COMMUNICATION FROM THE COMMISSION

'Horizon 2020 - The Framework Programme for Research and Innovation'

PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND THE COUNCIL

laying down the rules for the participation and dissemination in Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)

PROPOSAL FOR A COUNCIL REGULATION

on the Research and Training Programme of the European Atomic Energy Community (2014-2018) complementing the Horizon 2020 – The Framework Programme for Research and Innovation

ANNEXES

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ANNEXES

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ANNEX 1 - SURVEY ON ADMINISTRATIVE COSTS OF PARTICIPANTS IN FP7

Survey on administrative costs for participants in the 7th EU Framework Programme for Research and Technological Development (FP7)

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Final Report

8/07/2011

EXECUTIVE SUMMARY

1. For providing quantitative evidence on administrative costs of participation, an online survey among FP7 beneficiaries has been initiated. The results of this survey feed into the ex-ante impact assessment of the rules for participation of the Horizon 2020 Framework Programme for Research and Innovation. Detailed figures on the administrative costs for participation in FP7 were gathered for providing a baseline scenario for the future programme as a starting point for analysing potential simplification scenarios for reducing administrative efforts in Horizon 2020.
2. An invitation to participate in the survey was sent to contact persons (more than 70 000) in all FP7 grants. The questionnaire was completed by 3898 respondents (5.5% response rate). The distribution of the respondents by type of beneficiary, organisation type, country and funding scheme was in good coherence with the overall distribution of FP7 participations by these categories, confirming the representativeness of the sample.
3. The survey asked for estimates of the actual work effort (person days) for completing administrative tasks along the project life cycle, in four phases from proposal preparation and submission via grant negotiation and signature, grant management and reporting until ex-post audit. Each of the four phases was broken down into a number of detailed tasks.
4. To verify the results and preliminary conclusions with stakeholders, as well as the outcome of a parallel study by Deloitte using a qualitative case studies approach, workshops with two groups of experts, the Legal and Financial National Contact Points (NCPs) (4 April 2011) and experts representing key European stakeholders in EU funded research (28 April 2011) were organised. Both groups confirmed that the figures collected from the survey appear reasonable and form a good basis for the ex-ante impact assessment for the rules for participation of Horizon 2020.
5. It can therefore be concluded that the online survey has allowed gathering valuable and reliable information from the 3898 respondents. The analysis of the results and tables provide:
   - A collection of evidence to quantify the administrative efforts of the beneficiaries – throughout the life cycle of EU funded projects.
   - A tool to test different options (building blocks) or to build scenarios for future EU research and innovation funding , e.g. funding modalities and control framework, set-up of calls, project duration, size of projects, frequency of reporting, etc.
   - A tool that may also be used to improve the management of FP7 activities (e.g. work programmes definition, business processes, IT tools).
6. Using the median values of the data gathered, some typical model projects were constructed. For a typical small-scale 3-year collaborative project involving 9 partners and receiving € 3.000.000 EU contribution, the coordinator would typically have to employ 1/3 full-time equivalent over the duration of the project for fulfilling the administrative tasks and the 8 partners together 4/5 full-time equivalent**, i.e. the administrative work in the project in total would require slightly more than 1 full-time equivalent**. In larger projects, the absolute effort of the coordinator increases (up to ½ full-time equivalent).
7. Using the standard cost model, the data on person-days were translated into financial figures. For the typical collaborative project mentioned under point 6, the financial effort related to administrative participation costs is in the range of € 277.000, without ex-post

audit or € 284.000 when ex-post auditing is taken into account.

8. Figures confirm the assumption that in multi-partner projects the major burden lies with the coordinator. In a typical small-scale collaborative project, the coordinator has to spend 3 times the administrative effort of each individual partners. When it comes to a typical large-scale collaborative project, the coordinator's administrative effort is 4 times the one of each partner.
9. There is no marked dependence of the figures on most of the factors analysed (e.g. type of organisation, country, level of experience with EU funding). This tends to indicate that the administrative tasks are generic and linked to the EU rules and processes rather than to any local circumstances. A learning effect seems however to exist for coordinators and mono-beneficiaries who participate in more than one FP7 project. This would argue in favour of some continuity and stability in the rules and their implementation.
10. The management of the ongoing grant is the phase requiring the highest administrative effort. For coordinators, about 64% of the overall effort are linked to this phase (proposal preparation and submission: 18%, grant negotiation 13%, ex-post audit 5%). The largest potential for administrative burden reduction is therefore within the grant management phase.
11. In addition, internal management practices such as project officers' negotiation and management practices offer significant possibilities for simplification and reduction of the administrative workload of the beneficiaries.
12. As the success rate in the research programme is relatively low (about one in five proposals only is selected for funding) the costs for proposal preparation and submission are of particular importance. The data of the survey gathered on this part of the process lead to the conclusion that the administrative costs of an applicant for the preparation and submission of a proposal is in the order of € 8.000 on average (per partner in a proposal).
13. Two-stage calls are discussed as a mean to reduce the costs for proposal preparation and submission, in particular for applicants failing after the first stage. The data gathered in the survey from participants in two-stage calls indicate that on average 40% of the time for both stages is spent in the first stage, i.e. applicants failing in the first stage save on average 60% of costs for proposal preparation. The discussion of this conclusion in the two stakeholder workshops lead to a nuanced picture. Two-stage calls are positively perceived in bottom-up calls with high oversubscription. They seem less appropriate in areas with well-defined topics and in areas where short time-to-grant is crucial.
14. On the question of researchers' time recording, there is a strong request for clear conditions providing legal certainty. The Commission is also called to be flexible towards the different time-allocation systems at the beneficiaries and accept, for as far as possible, their usual management practices.
15. Participants of the survey were also asked to give their opinion on three potential scenarios for future EU funding rules. Clear preferences became apparent in the workshops discussions. In general terms, a scenario providing reimbursement of actual costs but with major simplifications to the eligibility rules gathers the most positive views, if combined with a harmonised application of the rules and improved communication and assistance to participants. The other two scenarios (output-based funding with project-specific lump sums for entire projects and extended use of flat rates, lump sums and scales of units) are perceived as alternatives for specific projects/partners or if proposed as options alongside the actual cost scenario.

Table of content

1. Introduction

1.1. Context and objectives

The survey was initiated as one element contributing to the ex-ante impact assessment for the rules for participation of Horizon 2020. The ex-ante impact assessment has to comprise estimates on the administrative costs for participation, taking the current Framework Programme (FP7) situation as the baseline, and analysing potential simplification scenarios for reducing administrative efforts in the future programme.

To address this issue, the Commission has launched two initiatives, an online survey among all FP7 participants and a study by Deloitte. Both exercises aimed at gathering evidence on the administrative costs of participation under FP7 and also to collect views on the potential for reducing administrative efforts in several simplification scenarios for the future programme. While the Deloitte study was more oriented towards a limited number of qualitative case studies, the on-line survey was aimed at gathering quantitative evidence for a number of projects sufficiently high to provide statistical relevance on the administrative costs borne by FP7 applicants and beneficiaries.

The results and preliminary conclusions of the two initiatives were presented and discussed at two workshops, one on 4 April 2011 with the FP7 Legal and Financial National Contact Points (NCPs) and a second one on 28 April 2011 with key stakeholders in European research (see list of participating organisations in Annex 3).

The main objectives of the survey were:

- To identify the administrative effort (working time estimated in person days) of FP7 applicants and beneficiaries for applying for and participating in FP7 funded projects, broken down by the different phases of the project life cycle.
- To define, through using the standard cost methodology approach of the Secretariat General, a "baseline scenario" against which different options for Horizon 2020 will be considered.
- To gather respondents' views on 3 possible scenarios for Horizon 2020:
    - Output-based funding with project-specific lump sums for entire projects
    - Extended use of flat rates, lump sums and scales of unit costs
    - Continuation of reimbursement of actual costs but with a simplification of the cost eligibility criteria.

1.2. General methodology

The survey addressed researchers and administrators participating in FP7 projects. Via an invitation e-mail sent to all FP7 project contacts identified in the CORDA database, respondents were asked to provide quantitative information on the working time spent by their organisation for fulfilling the FP7 administrative requirements (mandatory replies) and to add comments and give opinions on potential simplification options for the programme succeeding to FP7 (optional replies).

The project life cycle was split in four main phases: 1) Preparation and submission of the proposal, 2) Negotiation of the project and Grant Agreement signature, 3) Grant management and project reporting, and 4) Auditing of the project. The full questionnaire is provided in annex 4.

The survey was anonymous. Some basic information on the type of organisation, country and type of project was nevertheless collected to allow proper analysis of the data.

Respondents were asked to fill in their questionnaire with regard to one specific project. In case they were involved in several FP7 projects they were asked to reply for the one they were most familiar with, or to fill in several forms, one for each project. They were asked to consider the working time actually spent by their organisation for fulfilling the administrative requirements (not the overall delays for the completion of the different phases).

A pre-defined standard range of possible responses was given for all quantitative information on administrative burden (working time to complete one specified task or process). The standard range consisted of:

- "don't know" option for those lacking the respective information
- "not applicable (0 person-day)" for those not concerned with some step(s)
- Drop-down list containing values between 1 and 20 person-days (in steps of one day)
- Possibility to choose "more than 20 person-days" (with the obligation to give the exact figure in a separate field)

A dedicated functional mailbox was set-up to respond to questions and enquiries of contact persons interested in participating in the survey.

The survey lasted for 3 weeks, from 11 February 2011 until 4 March 2011.

For analysing the quantitative responses, the median value of working days has been determined for each question. Median value rather than average has been used as the exercise aimed at identifying, within the pool of responses, the point expressed in number of working days where 50% beneficiaries have completed a task or process.

2. Breakdown of respondents by categories

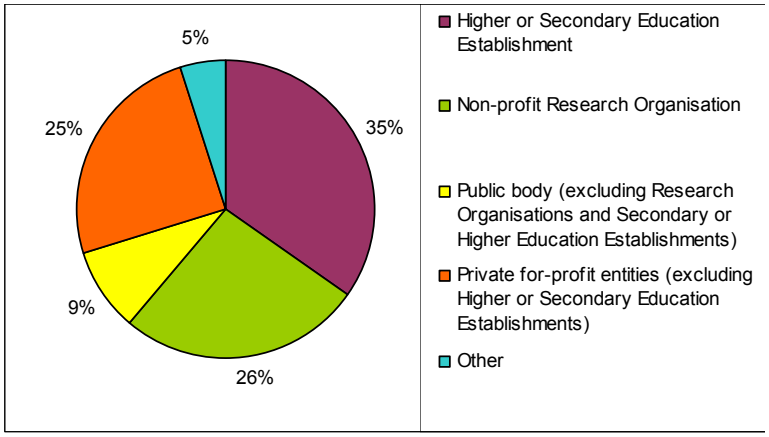
2.1. Response rate

A total number of 71 193 invitations were sent by e-mail to contact persons for FP7 beneficiary entities. This number excludes 10.5% of undelivered messages.

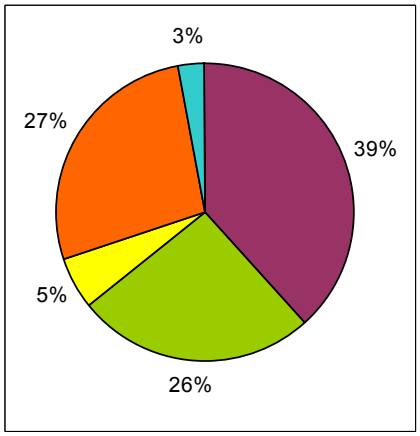
3898 responses have been submitted, equivalent to a response rate of 5.5%.

2.2. Distribution by type of responding organisations

Distribution of respondents

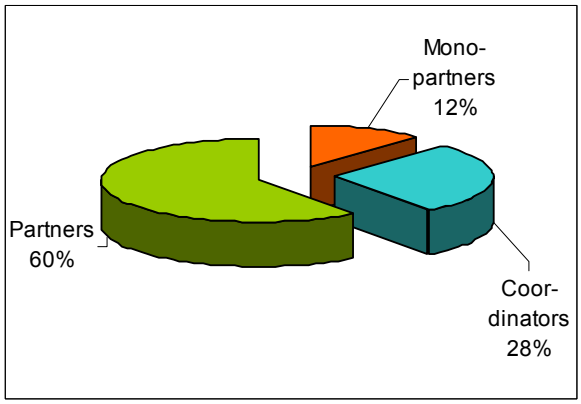


Distribution of FP7 participants



The distribution of respondents by type of organisation is sufficiently well representative for total FP7 participations.

2.3. Distribution by role in the project



In FP7 participations in total, partners account for 80% of participants. The distribution of the survey respondents shows a slightly higher proportion of mono-beneficiaries and coordinators

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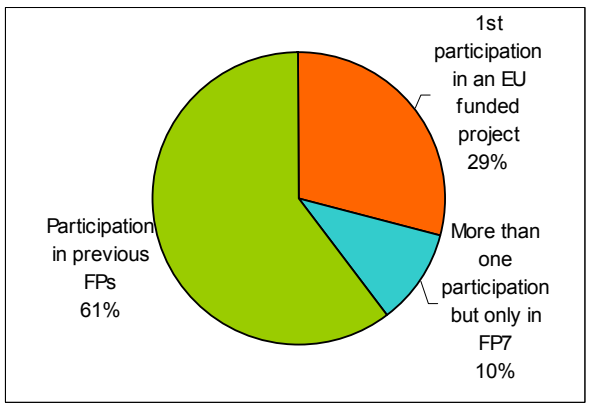
2.4. Distribution by experience with EU funded research

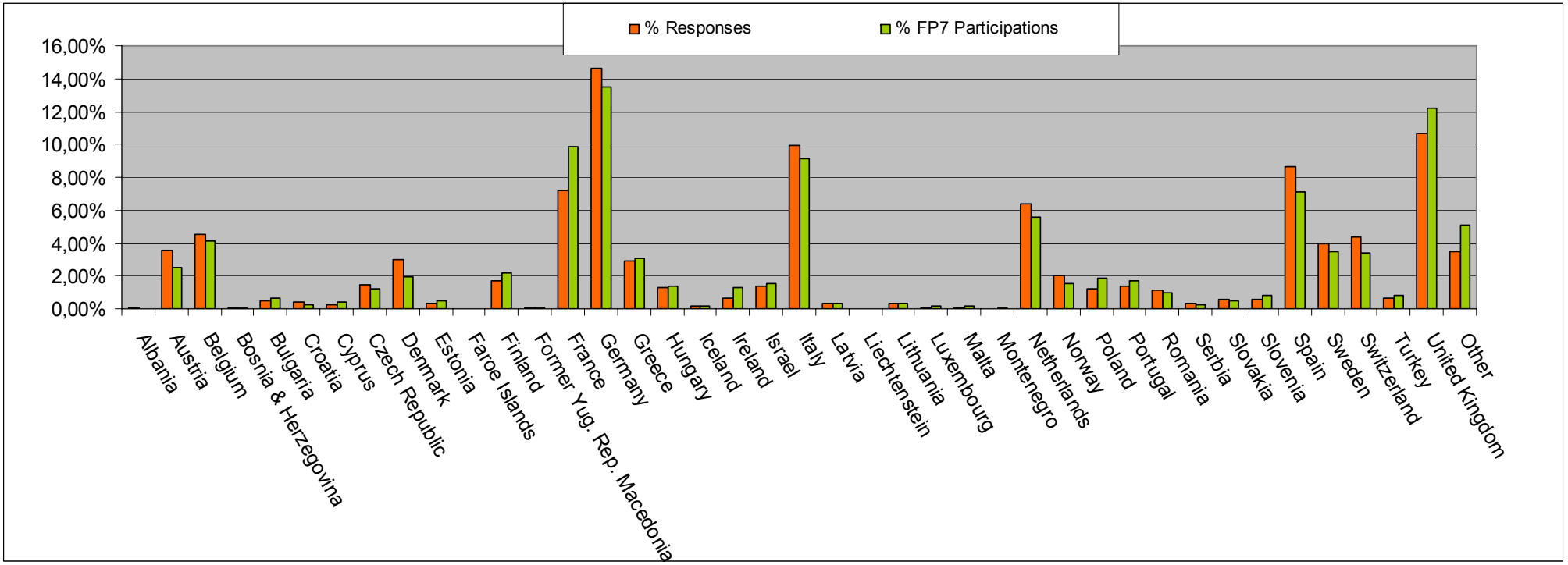


61% of respondents indicate that they participated in previous framework programmes, and 10% replied that they participate in more than one FP7 project.

First-time participants in FP7 account for 29% of the respondents.

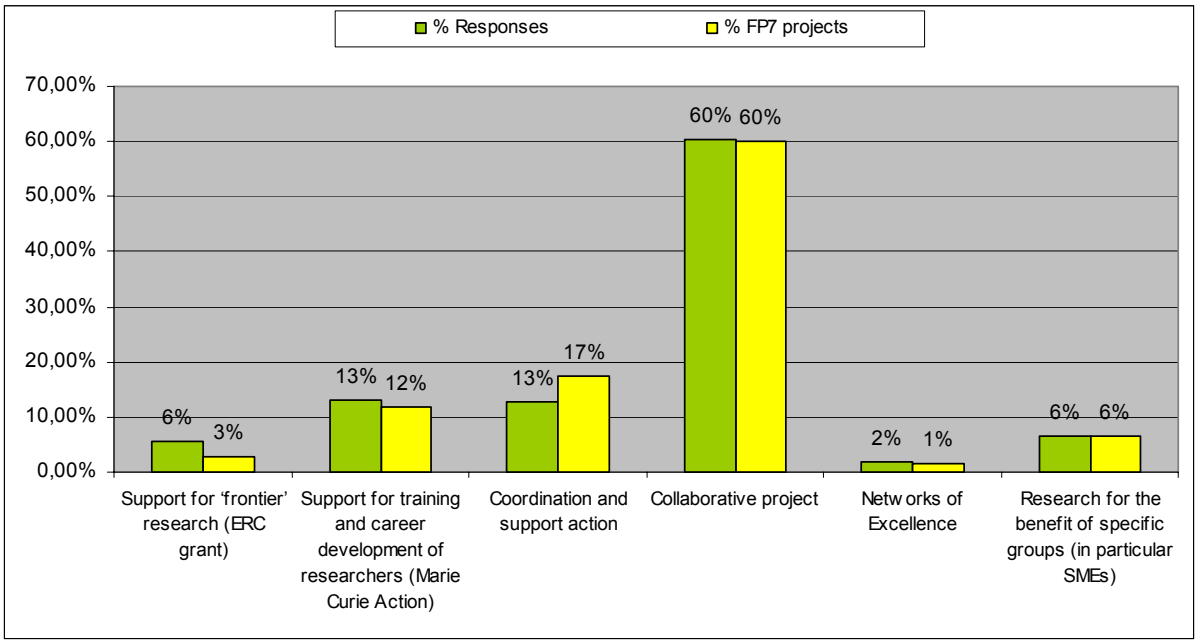
The influence of experience with EU funded research will be discussed later in the report.

2.5. Country of establishment of responding organisations as compared with participation in FP7



The distribution of responses by country is representative for the distribution of overall FP7 participations by country.

2.6. Distribution by type of project



The distribution of responses by project type is representative for the distribution of overall FP7 participations by project type.

Note: Combined projects are included in the collaborative project categories. They account for 4% of responses.

3. Processes and tasks applicable to all beneficiaries (Median values in working days – see Annex 1)

3.1. Preparation and submission of the proposal

3.1.1. Time necessary to study FP7 documentation – Question 1.1 (finding a suitable call and topic, and assessing eligibility to apply)

According to role in the projects, the number of working days is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
5	4	3

Potential for administrative burden reduction:

This task may be impacted at the level of the work programme definition, e.g.:

- Multiannual work programmes and/or open calls with or without cut-off dates: they allow planning for the applicants and decrease the need for screening the associated documentation.
- Follow-up funding: call information can be targeted to a known audience.

3.1.2. Time necessary for registration and validation of a legal entity via the URF (Participant Portal/Unique Registration Facility) – Question 1.5

According to role in the projects, the number of working days is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
2	2	2

Potential for administrative burden reduction:

This task affects all beneficiaries in a similar way. The registration efforts in FP7 (more than 25.000 entities validated) represent a significant 'acquis' whose benefit can be harvested in Horizon 2020 if the current definitions and categories are kept.

- Keeping and using the URF as currently defined is key to harvest FP7 investment both for the beneficiaries (at least 60% to be expected the same beneficiaries) and the Commission.

3.1.3. Two-stage calls: Distribution of effort between first and second stage

15.5% of coordinators, 18,2% of partners and 24,7% of mono-beneficiaries reported that they applied via a two-stage submission and evaluation process. They were asked to identify the split of overall effort for proposal preparation and submission between first and second stage. The percentage of working time invested in stage 1 is reported follows:

Coordinators (15,5% of 1106)	Partners (18,2% of 2335)	Mono-beneficiaries (24,7% of 457)
30%	40%	50%

Potential for administrative burden reduction:

Figures show that applicants failing in the first stage save a significant amount of time compared to applicants having to prepare full proposals in single-stage calls: 70% for coordinators, 60% for partners and 50% for mono-beneficiaries.

Discussion of this subject in the two stakeholder workshops lead to the conclusion that despite the potential burden reduction for applicants failing in the first stage, a generalisation of the two-stage

approach might not be useful. As two-stage calls increase time-to-grant, they should be used preferably for calls with broad topics and low success rates and /or in areas where time-to-grant is not so crucial. The one-stage approach would stay adequate for narrow topics with relatively high success rates or for areas that are very time-critical.

3.2. Negotiation of the project and Grant Agreement signature

3.2.1. Time necessary to analyse guidance documents – Question 2.1 (Evaluation Summary Report, Negotiation letter, Negotiation Guidance Notes, FP7 Guide to Financial Issues, model Grant Agreement, etc.)

The number of working days spent on this task is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
5	3	3

Potential for administrative burden reduction:
This task may be impacted at the level of the entire programme and work programme definition, e.g.:

- Simpler funding rules (fewer combinations of funding rates and/or funding schemes, more flat rates and lump sums) will ease the negotiation, both for the beneficiaries and for the Commission.
- More 2-stage calls associated with specific settings for 1st stage evaluation as mentioned above (3.1.3) is likely to decrease effort for negotiation.

3.2.2. Time necessary to complete the negotiation information via the online NEF tool – Question 2.7

The number of working days spent on this task is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
3	2	2

3.2.3. Time necessary to provide information for the Financial Capacity Check (FCC) – Question 2.8

The number of working days spent on this task is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
2	2	2

Potential for administrative burden reduction:
This task affects all beneficiaries in a similar way. It may be impacted at the level of the rules for Horizon 2020, e.g.:

- Increasing the EU contribution threshold for undergoing a FCC may exempt more beneficiaries from this administrative requirement.

Extending the coverage of the guarantee fund to all actions under Horizon 2020 would allow applying the exemptions from financial capacity checks to a larger number of participations (JTIs, CIP, EIT).

3.2.4. Time necessary to sign the Grant Agreement/Form A by the authorised representative – Question 2.9

The number of working days spent on this task is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
1	1	2

Potential for administrative burden reduction:

- Switching from Grant Agreements to Grant Decisions under Horizon 2020 would save at least one working day per beneficiary. The use of electronic visaing instead of paper signature would accelerate the signature process.

3.3. Grant management and project reporting

3.3.1. Time necessary per year for the administrative management of the project (i.e. read guidance, instruct staff on requirements and ensure compliance with e.g. time-recording, archiving, sub-contracting procedures, specific horizontal issues) – Question 3.3

The number of working days spent on these tasks per year is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
20	10	7

3.3.2. Time to prepare and submit a financial statement – Question 3.5 (including the reading of associated guidance and potential requests from the Commission for refinement/correction/completion

The number of working days spent on this task is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
10	4	5

Potential for administrative burden reduction:

- As this task appears once per reporting period extending the duration of the reporting periods would decrease the number of times this task has to be fulfilled. A simplification of the cost eligibility rules and a reduction of the number of combinations of funding rates, organisation types and activity types would lead to much simpler financial statements.

3.3.3. Time to provide a certificate on the financial statement – Question 3.7

The number of working days spent on this task is reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
4	3	3

Potential for administrative burden reduction:

- Increasing the FP7 ceiling of EUR 375,000 cumulative amount of payments made to a beneficiary would further reduce the number of certificates to be provided. Simpler cost eligibility rules and the use of flat rate and lump sums for certain cost categories would simplify the provision of certificates.

3.3.4. Need to adapt the usual accounting system

Participants of the survey were asked if they had to adapt their usual accounting practices to comply with the EU funding rules. The replies were as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
32,7% = Yes 17,9% = don't know	38,6% = Yes 18,7% = don't know	33,3% = Yes 41,4% = Don't know

Potential for administrative burden reduction:

At least one third of FP7 beneficiaries report specific accounting requirements linked to EU funding.

- Broadening the acceptance of the usual accounting practices of the beneficiaries at the level of the Rules for participation and Commission implementation decisions (where deemed necessary) would decrease the administrative burden of the beneficiaries, especially when taking into account the large beneficiaries, involved in numerous projects.

3.3.5. Implementation of a time recording system for the researchers

This FP7 requirement raises a lot of negative feelings among researchers. A dedicated question "*Does your entity implement a time recording system for the researchers?*" was therefore included in the survey. Figures are reported as follows:

Coordinators (1106)	Partners (2335)	Mono-beneficiaries (457)
▪ 44,4% = Always ▪ 22,6% = Only for EU projects	▪ 43,2% = Always ▪ 24,0% = Only for EU projects	▪ 17,5% = Always ▪ 28,0% = Only for EU projects

Potential for administrative burden reduction:

- A simplified system for time recording with clear minimum conditions fixed in the rules of Horizon 2020, also in order to avoid problems at the level of ex-post auditing.

3.4. Auditing of the project

3.4.1. Burden of ex-post audits – Question 4.1

At the time of the survey, only a minority of FP7 projects had yet undergone an audit. Replies indicate that 1 project out of 6 (16,3%) has been audited. In addition, 11,0% of respondents do not know if their project has been audited. The figures below on administrative effort related to audits can therefore only be indicative; they might not yet be representative of the overall ex-post audit burden in FP7.

3.4.2. Time to interact with auditors – Question 4.2

The number of working days spent on this task is reported as follows (for the 16,3% audited beneficiaries):

Coordinators (17%)	Partners (16%)	Mono-beneficiaries (14%)
4	3	5

3.4.3. Time to gather the necessary information/documentation – Question 4.3

The number of working days spent n this task is reported as follows (for the 16,3% audited beneficiaries):

Coordinators (17%)	Partners (16%)	Mono-beneficiaries (14%)
5	4	5

3.4.4. Time to ensure audit follow-up and implementation of audit results – Question 4.4

The number of working days spent on this task is reported as follows (for the 16,3% audited beneficiaries):

Coordinators (17%)	Partners (16%)	Mono-beneficiaries (14%)
3	2	2

4. Processes and tasks applicable to single beneficiaries in mono-partner projects (Median values in working days – see Annex 1)

4.1. Preparation and submission of the proposal (Questions 1.3, 1.6 & 1.8)

Time to:	All mono-beneficiaries (457)	ERC grants (181)	MC grant (228)	CSA grants (48)
Find & make arrangements with the host institution	**3**	3	3	-
Develop the scientific-technical content of the proposal	**14**	15	14	15
Complete and submit proposal via EPSS (Parts A and B)	**2**	2	2	3

For all single beneficiary grants, respondents indicate similar figures in phase 1 of project life cycle, the longest sub-process being to develop the scientific content of the proposal. When it comes to developing the scientific-technical content and actually submitting the proposal via EPSS, the efforts invested amount globally to 50% of the efforts required from Coordinators of multipartner projects.

4.2. Negotiation of the project and Grant Agreement signature (Question 2.4)

Time to:	All mono-beneficiaries (457)	ERC grants (181)	MC grant (228)	CSA grants (48)
Make arrangements with the host institution	**3**	3	2	-

Figures appear slightly lower for MC grants.

4.3. Grant management and project reporting (Questions 3.1, 3.6 & 3.12)

Time to:	All mono-beneficiaires (457)	ERC grants (181)	MC grant (228)	CSA grants (48)
Interact with the [ERCEA/REA/ Commission] Project Officer	**3**	3	3	4
Prepare and submit a periodic report (scientific and financial parts), including potential re-quests from the Commission for refinement/correction/completion	**5**	3	5	10
Prepare and submit the final report	**5**	6	5	8

Research grants (ERC and MC) require less effort than Support Actions for all these tasks. This may be in relation with the specific activities covered by Support Actions.

5. Processes and tasks applicable to coordinators only

(Median values in working days – see Annex 1)

5.1. Preparation and submission of the proposal (Questions 1.2, 1.6, 1.8 & 1.10)

Time to:	All COO (1106)	CP-Large (119)	CP-Medium (172)	CP-small (336)	Specific SMEs (67)	Com-bined (46)	NoE (10)	CSA (172)	ERC grants (25)	MC grants (159)
Set up the consortium	**10**	15	14	10	15	10	10	10	2	10
Develop the scientific-technical content of the proposal	**30**	40	30	25	20	30	14	20	20	20
Complete and submit proposal via EPSS (Parts A and B)	**4**	5	4	3	4	6	5	4	1	3
Prepare and participate in a hearing	**4**	5	4	4	4	4	3	3	3	3

As could be expected, efforts reported depend on the type of funding scheme and the associated complexity. Developing the scientific-technical content of the proposal is the major task in this phase of the project life cycle. It is followed by setting up the consortium.

5.2 Negotiation of the project and Grant Agreement signature (Questions 2.2, 2.3, 2.5, 2.10 & 2.11)

Time to:	All COO (1106)	CP-Large (119)	CP-Medium (172)	CP-small (336)	Specific SMEs (67)	Com-bined (46)	NoE (10)	CSA (172)	ERC grants (25)	MC grants (159)
Prepare and attend a nego-tiation meeting	**4**	5	4	4	5	4	3	4	2	4
Interact with the Consortium partners (inclu-ding the CA)	**10**	18	10	10	10	14	10	8	4	10
Adapt the project content (DoW – annex I to GA) to ESR recommenda-tions, including dealing with horizontal issues	**7**	10	9	6	10	10	7	7	4	5
Finalise the GA signature process	**4**	5	4	4	5	4	5	5	3	4
Distribute the EU pre-financing	**2**	3	2	2	2	2	2	2	1	2

As could be expected, efforts reported depend on the type of funding scheme and the associated complexity. The longest sub-process is linked to interaction within the consortium, followed by adaptation of the project content.

5.3. Grant management and project reporting (Questions 3.1, 3.2, 3.6, 3.8, 3.9, 3.10 & 3.12)

Time to:	All COO (1106)	CP-Large (119)	CP-Medium (172)	CP-small (336)	Specific SMEs (67)	Com-bined (46)	NoE (10)	CSA (172)	ERC grants (25)	MC grants (159)
Interact per year with the Project Officer (excl. periodic reporting)	**5**	10	5	5	6	5	5	7	3	5
Deal per year with horizontal issues	**20**	20	19	15	10	20	20	20	7	14
Collect contributions, assemble and submit a periodic report	**15**	20	15	14	15	15	16	12	5	10
Distribute an interim payment	**2**	2	2	2	2	1	2	2	1	2
Undergo a technical review at the request of the Commission	**8**	10	10	7	5	6	5	9	2	5
Prepare amendments to the GA	**5**	10	10	5	6	5	5	5	2	4
Assemble and submit the final report	**15**	15	15	15	18	10	16	15	5	10

Again as could be expected, efforts reported depend on the type of funding scheme and the associated complexity. Significant efforts are required for dealing with horizontal issues.

6. Processes and tasks applicable to partners only

(Median values in working days – see Annex 1)

6.1. Preparation and submission of the proposal (Questions 1.4, 1.7 & 1.9)

Time to:	All Partners (2335)	CP-(1564)	Specific SMEs (185)	Com-bined (111)	NoE (67)	CSA (274)	ERC grants (16)	MC grants (118)
Find suitable partners/con-sortium	**5**	5	5	5	5	5	7	3
Develop own part of scien-tific-technical content of the proposal	**10**	10	10	10	10	7	14	5
Fill in the ad-ministrative forms via EPSS	**1**	1	2	1	1	1	3	2

6.2. Negotiation of the project and Grant Agreement signature (Question 2.6)

Time to:	All Partners (2335)	CP-(1564)	Specific SMEs (185)	Com-bined (111)	NoE (67)	CSA (274)	ERC grants (16)	MC grants (118)
Adapt own part of project content (DoW – annex I to GA) to ESR recommenda-tions	**4**	4	4	5	3	3	3	3

Figures given by responding partners show that they are actively contributing to this task (as compared to coordinators who report 7 working days as median value).

Grant management and project reporting (Questions 3.4 & 3.11)

Time to:	All Partners (2335)	CP-(1564)	Specific SMEs (185)	Com-bined (111)	NoE (67)	CSA (274)	ERC grants (16)	MC grants (118)
Prepare contribution to the scien-tific-technical part of a pe-riodic report	**6**	6	7	7	8	5	5	3
Prepare contribution to the final report	**6**	7	5	7	7	6	5	5

Figures given by responding partners show that partners efforts for this phase vary only slightly with the type of funding scheme.

7. Dependence of administrative effort on the type and situation of beneficiaries (Median values in working days – see Annex 2)

Some specific questions were asked to respondent in order to gather information on the possible influence of specific situations or conditions that could impact of the efforts required for participating in EU funded projects. These specific factors were grouped by:

- Type of participating entities:
  - Higher or Secondary Education Establishment (HES)
  - Non-profit Research Organisation (REC)
  - Private for-profit entities (excluding Higher or Secondary Education Establishments) (PRC)
  - Public body (excluding Research Organisations and Secondary or Higher Education Establishments) (PUB)
  - Other (OTH)
- Type of participating countries:
  - "old" Member States (EU15)
  - "new" Member States (EU12)
  - Associated countries (AC)
- SME status
- Experience with participating in EU funded projects:
  - 1st participation in an EU funded project (1st part.)
  - More than one participation but only in FP7 (FP7s part.)
  - Participation in previous FPs (Prev. FPs)

For these different factors, the numbers of responses to the survey are distributed as follows (some categories, e.g. mono-beneficiaries being private entities are not sufficiently represented to support any conclusive statement):

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	457	302	97	6	43	9	351	25	71	40	253	60	144
COO	1106	398	352	209	95	52	981	31	82	198	206	112	788
Partners	2335	658	578	743	218	138	1751	254	215	749	680	234	1421

7.1. Preparation and submission of the proposal (phase 1 – details in Annex 2)

In the table below, numbers of working days spent on the different processes/tasks identified for phase 1 of the project life cycle have been added in order to have one global figure for this phase, which can then be compared when selecting specific factors as listed above:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	24	24	25	21	23	24	23	23	25	21	23	24	23
COO	55	53	54	50	61	51	53	63	57	46	56	44	53
Partners	22	23	22	23	19	20	22	24	22	24	24	23	22

In addition, respectively 15% of mono-beneficiaries, 26% of coordinators and 21% of partners have indicated that processes/tasks that were not listed in the questionnaire have caused significant administrative effort as follows:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	4	4	4	2	15	2	4	4	5	2	4	3	4
COO	7	7	5	7	5	10	7	3	10	7	15	7	6
Partners	5	5	4	5	4	4	5	10	5	5	5	4	5

As can be concluded from the tables above, neither the organisation type nor the country of origin nor the level of experience with participation in EU funded projects have a significant influence on the administrative effort for preparing and submitting proposals to FP7. Most marked differences appear for coordinators who participate in more than one FP7 project and from SME who spend respectively 20% and 16% time less than average, and for coordinators from EU12 who spend 15% time more than average.

7.2. Negotiation of the project and Grant Agreement signature (phase 2 – details in Annex 2)

In the table below, numbers of working days spent on the different processes/tasks identified for phase 2 of project life cycle have been added in order to have one global figure for this phase, which can then be compared when selecting specific factors as listed above:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	12	12	13	5	11	10	12	11	13	15	12	11	11
COO	38	36	38	43	42	42	38	35	40	38	40	36	38
Partners	12	13	13	12	11	11	11	16	11	12	13	12	11

In addition, respectively 14% of mono-beneficiaries, 19% of coordinators and 11% of partners have indicated that processes/tasks that were not listed in the questionnaire have caused significant administrative effort as follows:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	5	6	2	0	20	8	5	5	8	1	8	8	3
COO	10	10	7	6	20	12	10	7	15	8	15	10	10
Partners	5	4	4	9	5	3	5	5	8	7	5	8	5

As can be concluded from the tables above, neither the organisation type nor the country of origin nor the level of experience with participation in EU funded projects have a significant influence on the administrative effort for negotiating grants in FP7.

7.3. Grant management and project reporting (phase 3 – details in Annex 2)

In the table below, numbers of working days spent on the different processes/tasks identified for phase 3 of project life cycle have been added in order to have one global figure for this phase, which can then be compared when selecting specific factors as listed above:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	28	31	27	23	37	28	26	38	41	26	26	26	31
COO	104	103	103	93	112	112	104	110	89	89	96	89	105
Partners	29	32	32	26	28	26	28	44	27	27	28	30	31

In addition, respectively 12% of mono-beneficiaries, 17% of coordinators and 13% of partners have indicated that processes/tasks that were not listed in the questionnaire have caused significant administrative effort as follows:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	10	15	5	1	5	10	10	5	20	5	20	5	8
COO	10	10	10	10	15	10	10	25	10	10	12	10	10
Partners	8	7	8	10	5	10	8	7	10	8	10	7	8

As can be concluded from the tables above, neither the organisation type nor the country of origin nor the level of experience with participation in EU funded projects have a significant influence on the administrative effort for managing grants in FP7, exception made for partners from EU12 who spend 50% more time than average partners. Other marked differences appear for coordinators who participate in more than one FP7 project, from SME and from associated countries who spend 14% time less than average, and for mono-beneficiaries from associated countries, EU12 and public bodies who spend more than average (46%, 36% and 32% respectively).

7.4. Auditing of the project (phase 4 – details in Annex 2)

Respectively 14% of mono-beneficiaries, 17% of coordinators and 16% of Partners have indicated that their project has been audited. The reported numbers of working days spent on the different processes/tasks identified for phase 4 of project life cycle have been added in order to have one global figure for this phase for the audited project, which can then be compared when selecting selected factors as listed above:

	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	12	13	10	10	13	13	10	7	13	9	10	7	12
COO	12	11	12	13	15	12	12	15	22	14	13	15	11
Partners	9	10	8	10	7	10	9	11	8	8	11	8	9

In addition, respectively 9% of audited mono-beneficiaries, 13% of audited coordinators and 11% of audited partners have indicated that processes/tasks that were not listed in the questionnaire have caused significant administrative effort as follows:

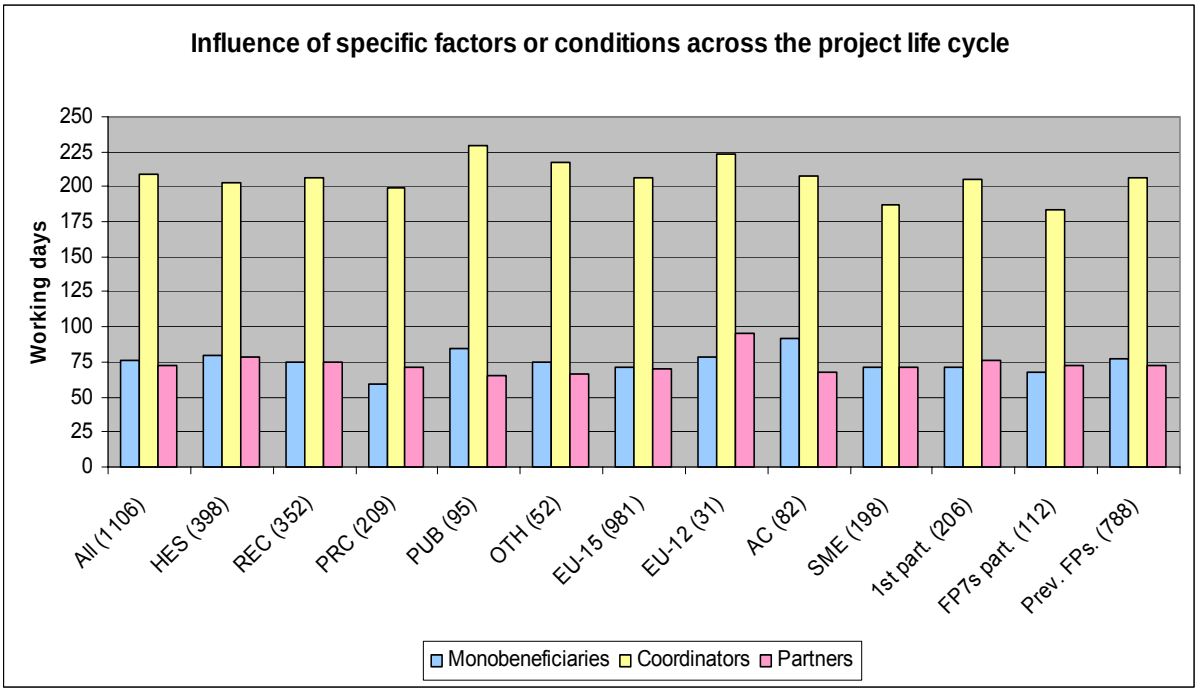
	All	HES	REC	PRC	PUB	OTH	EU-15	EU-12	AC	SME	1st part.	FP7s part.	Prev. FPs.
Monob.	10	10	0	0	0	1	10	0	30	0	10	0	2
COO	4	4	5	2	2	11	4	0	5	5	4	2	5
Partners	5	5	10	5	4	0	5	7	6	5	14	3	5

7.5. Total figures (phases 1 to 4 – details in Annex 2)

The influence of organisation type, country of origin and level of experience with EU funded projects on the total required administrative effort (in working days) is summarised in the following graph.
Globally, there is no evidence for marked differences between categories of beneficiaries following these factors. This tends to indicate that beneficiaries of EU funded research are playing on sufficiently similar grounds and/or that the administrative tasks related to participation are rather independent of the local circumstances of beneficiaries. As derogation to this general finding, there seems however to be a positive learning effect for coordinators and mono-beneficiaries participating in more than one FP7 project.

In some more detail, figures show that:

- Coordinators from PUB, OTH and EU12 report a somewhat higher effort than average, while those from SME and the ones participating in more than one FP7 project report lower than average effort.
- Mono-beneficiaries from PRC and with more than one FP7 project report efforts below average while those from PUB and AC score higher.
- Partners from EU12 report somewhat higher than average effort.
- SME beneficiaries report systematically slightly lower effort than average.



8. Simplification options for the future EU research and innovation programme (optional for the respondents)

8.1. Three potential scenarios

Respondents' views were collected on three potential scenarios for Horizon 2020.

8.1.1. Scenario 1: Output-based funding with project-specific lump sums for entire projects

A change from the current system based on reporting and reimbursement of actual costs towards a system of project-specific lump sums for entire projects that are agreed for each project in the negotiation, and payment of the EU financial contribution against the delivery of output/results. This implies no more cost reporting and no more financial auditing but a closer scientific/technical assessment of the projects and their output/ results.
In this scenario, lump sums are global amounts, fixed ex-ante and based on an estimate of expected inputs. They replace the "actual costs" model and reduce the amount of detailed checking before payment, and result in no need for financial audits.

8.1.2. Scenario 2: Extended use of flat rates, lump sums and scales of units

The extended use of flat rates, lump sums and scales of units for selected cost categories (notably for personnel, travel, consumables, etc.), replacing the reporting of actual costs. In this scenario, reporting on generating events (hours worked, days of business trips made, etc.) would still be necessary but the actual costs related to these items would no longer be reported.
Flat rates are standard percentage rate applied to actual costs (i.e. indirect costs calculated on the basis of a percentage of direct costs incurred) or standard scale-of-unit costs (i.e. standard amounts per unit of input (e.g. a "person-day")). Scale-of-unit costs may be unique or applied with a corrective coefficient per country.

8.1.2. Scenario 3: Continuation of current cost reporting approach but with a simplification of the cost eligibility criteria

A continuation of the current approach based on reporting of actual costs (with a limited use of flat rates and lump sums) but with a simplification of the cost eligibility criteria, allowing for a broad acceptance of the usual accounting and management practices of the beneficiaries.

8.2. Global assessment of the three scenarios

	Scenario 1 Lump-sums for entire projects (970 responses)	Scenario 2 More lump-sums and flat-rates (579 responses)	Scenario 3 Simplified actual costs (580 responses)
In favour (best option / less burden)	**48%**	27%	**51%**
Best for personnel costs		2%	
Best for indirect costs		1%	
Against (lower than real costs / no simplification / financial risk)	24%	**42%**	18%
Dubitative (Simplification difficult to evaluate)	24%	27%	28%
No trust (it will not work in practice)	4%	2%	4%

When expressing their views, respondents favour mainly scenarios 1 and 3, sometimes both together (totals by rows may be more – or less – than 100%), and are against scenario 2.

8.3. Respondents comments and suggestions on the proposed scenarios

8.3.1. On scenario 1: Output-based funding with project-specific lump sums for entire projects

- Could inspire fraud (much repeated)
- What about non-performing partners? (repeated)
- More complex and risky for coordinators (repeated)
- Doubts about the quality and independency of the reviewers (repeated)
- Need for a clear definition of outputs
- Use of milestones per partner
- Keep controls on durable equipment
- Pay attention to quality of results
- Could be difficult for the management of the partners
- Milestones should be flexible and revisable
- Concerns about quantification of results
- Too radical change
- Discourages high–risk –high-gain projects
- Maybe useful for private companies, particularly SMEs
- Coupled with simplification of reports
- Poses financial risks for beneficiaries
- May be useful for small grants
- Results in research are uncertain, cannot be guaranteed ex-ante
- More complicated proposal preparation

8.3.2. On scenario 2: Extended use of flat rates, lump sums and scales of units

- Only favourable for low-costing countries (repeated)
- Must go along with eliminating time-sheets (repeated)
- Only worth if adjusted by country (repeated)
- Maybe for travels
- Risk of too low rates - all depends on the level of the rate
- Impact of exchange rates

8.3.3. On scenario 3: Continuation of current cost reporting approach but with a simplification of the cost eligibility criteria

- Fewer cost eligibility criteria requested – acceptance of usual accounting practice
- Fewer certificates
- Fixed and unique rules (continuity)
- Accept non-recoverable VAT as eligible cost
- Ask for less detail during budget negotiation
- Simpler rules for subcontracting

8.4. Detailed assessment by phases (rating of perceived impact)

8.4.1. Scenario 1: Output-based funding with project-specific lump sums for entire projects

For Proposal preparation and submission:			
	Number of requested records	% of total number records (3898)	% of total number records (**3032**)
No reduction	1311	33,63%	43,24%
Up to 10% reduction	685	17,57%	22,59%
Up to 30% reduction	447	11,47%	14,74%
Up to 50% reduction	146	3,75%	4,82%
More than 50% reduction	137	3,51%	4,52%
Increase instead of reduction	306	7,85%	10,09%
Not responded	-	22,22%	-
For Grant negotiation and signature:			
	Number of requested records	% of total number records (3898)	% of total number records (**2993**)
No reduction	1232	31,61%	41,16%
Up to 10% reduction	700	17,96%	23,39%
Up to 30% reduction	462	11,85%	15,44%
Up to 50% reduction	168	4,31%	5,61%
More than 50% reduction	115	2,95%	3,84%
Increase instead of reduction	316	8,11%	10,56%
Not responded	-	23,22%	-
For Grant management and reporting:			
	Number of requested records	% of total number records (3898)	% of total number records (**2992**)
No reduction	387	9,93%	12,93%
Up to 10% reduction	447	11,47%	14,94%
Up to 30% reduction	844	21,65%	28,21%
Up to 50% reduction	604	15,50%	20,19%
More than 50% reduction	539	13,83%	18,01%
Increase instead of reduction	171	4,39%	5,72%
Not responded	-	23,24%	-
For Ex-post auditing:			
	Number of requested records	% of total number records (3898)	% of total number records (**2675**)
No reduction	538	13,80%	20,11%
Up to 10% reduction	365	9,36%	13,64%
Up to 30% reduction	417	10,70%	15,59%
Up to 50% reduction	416	10,67%	15,55%
More than 50% reduction	748	19,19%	27,96%
Increase instead of reduction	191	4,90%	7,14%
Not responded	-	31,38%	-

8.4.2. Scenario 2: Extended use of flat rates, lump sums and scales of units

For Proposal preparation and submission:			
	Number of requested records	% of total number records (3898)	% of total number records (**2810**)
No reduction	1410	36,17%	50,18%
Up to 10% reduction	724	18,57%	25,77%
Up to 30% reduction	365	9,36%	12,99%
Up to 50% reduction	95	2,44%	3,38%
More than 50% reduction	61	1,56%	2,17%
Increase instead of reduction	155	3,98%	5,52%
Not responded	-	27,91%	-
For Grant negotiation and signature:			
	Number of requested records	% of total number records (3898)	% of total number records (**2765**)
No reduction	1364	34,99%	49,33%
Up to 10% reduction	757	19,42%	27,38%
Up to 30% reduction	377	9,67%	13,63%
Up to 50% reduction	89	2,28%	3,22%
More than 50% reduction	52	1,33%	1,88%
Increase instead of reduction	126	3,23%	4,56%
Not responded	-	29,07%	-
For Grant management and reporting:			
	Number of requested records	% of total number records (3898)	% of total number records (**2794**)
No reduction	568	14,57%	20,33%
Up to 10% reduction	813	20,86%	29,10%
Up to 30% reduction	850	21,81%	30,42%
Up to 50% reduction	282	7,23%	10,09%
More than 50% reduction	126	3,23%	4,51%
Increase instead of reduction	155	3,98%	5,55%
Not responded	-	28,32%	-
For Ex-post auditing:			
	Number of requested records	% of total number records (3898)	% of total number records (**2485**)
No reduction	728	18,68%	29,30%
Up to 10% reduction	591	15,16%	23,78%
Up to 30% reduction	570	14,62%	22,94%
Up to 50% reduction	258	6,62%	10,38%
More than 50% reduction	192	4,93%	7,73%
Increase instead of reduction	146	3,75%	5,88%
Not responded	-	36,25%	-

8.4.3. Scenario 3: Continuation of current cost reporting approach but with a simplification of the cost eligibility criteria

For Proposal preparation and submission:			
	Number of requested records	% of total number records (3898)	% of total number records (**2830**)
No reduction	1728	44,33%	61,06%
Up to 10% reduction	685	17,57%	24,20%
Up to 30% reduction	245	6,29%	8,66%
Up to 50% reduction	75	1,92%	2,65%
More than 50% reduction	46	1,18%	1,63%
Increase instead of reduction	51	1,31%	1,80%
Not responded	-	27,40%	-
For Grant negotiation and signature:			
	Number of requested records	% of total number records(3898)	% of total number records **(2803**)
No reduction	1618	41,51%	57,72%
Up to 10% reduction	743	19,06%	26,51%
Up to 30% reduction	266	6,82%	9,49%
Up to 50% reduction	94	2,41%	3,35%
More than 50% reduction	47	1,21%	1,68%
Increase instead of reduction	35	0,90%	1,25%
Not responded	-	28,09%	-
For Grant management and reporting:			
	Number of requested records	% of total number records(3898)	% of total number records (**2813**)
No reduction	744	19,09%	26,45%
Up to 10% reduction	1091	27,99%	38,78%
Up to 30% reduction	651	16,70%	23,14%
Up to 50% reduction	186	4,77%	6,61%
More than 50% reduction	96	2,46%	3,41%
Increase instead of reduction	45	1,15%	1,60%
Not responded	-	27,83%	-
For Ex-post auditing:			
	Number of requested records	% of total number records(3898)	% of total number records (**2555**)
No reduction	892	22,88%	34,91%
Up to 10% reduction	837	21,47%	32,76%
Up to 30% reduction	477	12,24%	18,67%
Up to 50% reduction	180	4,62%	7,05%
More than 50% reduction	116	2,98%	4,54%
Increase instead of reduction	53	1,36%	2,07%
Not responded	-	34,45%	-

8.4.4. Comments – Potential for administrative burden reduction

For all three scenarios, respondents are of the view the potential impact on proposal preparation and submission and on negotiation would be minor ("No reduction" is the majority reply), i.e. respondents do not *a priori* expect any specific impact of the scenarios on the administrative burden up to the signature of the grant.

As concerns phase 3 (Grant management and reporting), respondents estimate that scenario 1 and 2 could offer a 30% reduction of the administrative burden, while scenario 3 could offer less, up to 10%.

Views on ex-post auditing highlight a strong expected impact for scenario 1 (more than 50% reduction) and no reduction for scenarios 2 and 3.

9. Number 1 priority for simplification

Respondents were asked (optionally) to indicate their "number 1 priority for one concrete and feasible simplification measure in the programme succeeding to FP7". 759 suggestions were put forward.

Priorities number 1 (17%) and number 2 (15,5%) concern the grant management phase, calling for the abolition of time-sheets and for simplifying the reporting both for the financial and the scientific-technical side. The system of deliverables, work packages and milestones and the level of detail requested in reporting (including the variations in requirements between different Commission services or staff) were clearly identified as an area for improvement.

Better IT tools and services and better (simpler) guidance documents appear too in the top 10. Suggestions related to proposal submission and evaluation count for only 10% of responses.

Priority order	Type	Suggestion	Number	Percen-tage
1	Grant management	Simplify time-recording (no time sheets)	130	17,1%
2	Grant management	Simplify reporting (including financial), re-think system of deliverables	118	15,5%
3	General	Use output-based with lump sums for whole projects	87	11,5%
4	IT tools & services, Guidance documents	More integrated, stable and user-friendly PP (including e-signature)	73	9,6%
5	Costs accounting	Extended use of flat rates and lump sums	55	7,2%
6	Costs accounting	Accept usual accounting practice	42	5,5%
7	Costs accounting	More flexibility in reallocation of funds (and work plan)	31	4,1%
8	IT tools & services, Guidance documents	Better help service and training/guidance	30	4,0%
9	Proposal submission and evaluation	More 2-stage submission	29	3,8%
10	Costs accounting	Reimburse non-recoverable (and non-identifiable) VAT	29	3,8%
11	Costs accounting	Fewer combinations ICM, reimbursement rate, activity types	23	3,0%
12	Ex-post audit	Abolish ex-post audit	20	2,6%
13	Proposal submission and evaluation	More possibilities for smaller consortia	15	2,0%
14	Grant management	Consistency of interpretation, central clearing house	13	1,7%
15	Proposal submission and evaluation	Extend ERC practice to all calls	12	1,6%
16	General	Continuity, stability (also for PO responsible for the project)	12	1,6%
17	Proposal submission and evaluation	Impact, EU dimension, socio-economic relevance to be removed from proposal writing	10	1,3%
18	Proposal submission and evaluation	More open calls	7	0,9%
19	Costs accounting	No depreciation on equipment (reimburse full purchase)	5	0,7%
20	General	More transparent process for establishing work programmes and calls	4	0,5%

21	Costs accounting	Reintroduce FP6 AC model	3	0,4%
22	Costs accounting	Align rules between FP, JTIs, CIP…	3	0,4%
23	Grant management	Allow professional coordinators (consultants)	2	0,3%
24	Ex-post audit	Link ex-post audit strategy to scientific performance	2	0,3%
25	Proposal submission and evaluation	Fully remote evaluation	1	0,1%
26	Proposal submission and evaluation	Make briefing for evaluators available to proposers in advance	1	0,1%
27	Grant management	Unique Commission contact with phone n° always accessible	1	0,1%
28	Ex-post audit	Reduce period for ex-post audit from 5 to 1year, in particular for SMEs	1	0,1%
			759	100%

10. Benchmark of FP7 against other national or international research funding programmes

Finally, respondents were asked (optionally) to compare FP7 with other research funding programmes. 468 replies were received. 38 respondents quoted FP7 as the best programme according to their experience.

German programmes are the most reported. This may in part be related to the number of German respondents which is the highest (15%).

Proposed benchmark programmes (simpler programmes)	Simpler financial rules	Lighter proce-dures	Fewer reporting require-ments	Fewer audits	Better evalua-tion	Better IT tools	In general
German National Programmes (DFG, GACR, ANR, BMBF, BMWI, BMZ, AIF, Von Humboldt foundation, BMU, ZIM)	**98**	**83**	**80**	**66**	**36**	**22**	**2**
UK National Programmes (EPSRC, BBSCR, AHRC,TSB, NERC, EPSRC, DFID, DEFRA, AICR, MRC, Wellcome Trust)	**77**	**73**	**71**	**63**	**35**	**30**	**2**
US (DARPA, Cancer Research Fellowships, NSF, NIH, Navy, SBIR)	**54**	**48**	**43**	**36**	**29**	**19**	**4**
Others (Gates Foundation, Brazil, Canada, Russia, Turkey, EFSD, EMBO,HFPS, HHMI, NATO, NordForsk, Mcdonnell)	**27**	**54**	**20**	**18**	**9**	**10**	
Switzerland National Programmes (SNF, KTI, CTI)	**26**	**22**	**22**	**15**	**11**	**5**	
Sweden National Programmes (FFI, FORMAS)	**26**	**27**	**26**	**25**	**10**	**12**	
Netherlands National Programmes (EOS, NWO, IIS)	**24**	**20**	**18**	**16**	**7**	**2**	
Austrian National Programmes (FWF, FFG, Climate and Energy Found)	**17**	**11**	**14**	**9**	**3**	**3**	
France National Programmes (ANR, FUI)	**16**	**11**	**11**	**9**	**4**	**2**	**1**
European Space Agency	**13**	**10**	**10**	**6**	**5**		
Belgium National Programmes (IWT, FWO, IAP, Belspo, ANR, WIST)	**13**	**10**	**8**	**5**	**3**	**4**	
Norway National Programmes (SKATTEFUNN, NRC)	**12**	**11**	**9**	**9**	**1**	**4**	

Denmark National Programmes (FNU)	**11**	**10**	**9**	**5**	**5**	**3**	
Spain National Programmes (Cenit, Plan Nacional, Excelencia)	**6**	**6**	**5**	**2**	**2**	**1**	
EUREKA	**6**	**6**	**4**	**4**	**2**		
COST actions	**5**	**3**	**5**	**2**	**1**	**1**	
Israel National Programmes (ISF)	**4**	**2**	**2**	**4**	**1**		
Finland National Programmes (TEKES)	**4**	**3**	**4**	**4**		**2**	
CIP	**4**	**5**	**3**	**2**		**1**	
Italy National Programmes	**3**	**3**	**2**	**2**			
Poland National Programmes (MNiSW)	**2**	**2**	**1**	**1**			
Australian Research Council	**2**	**2**	**1**			**2**	
Czech National Programmes	**1**	**1**					
ERC	**4**	**4**	**4**	**2**	**3**		**1**
Previous FPs							**7**
FP7							**38**
"Any other"							**17**
Totals	**455**	**427**	**372**	**305**	**167**	**123**	

11. Discussion and conclusions

11.1 Validation of the survey results

The survey figures were presented to and discussed with two different groups of experts, the Legal and Financial National Contact Points (workshop on 4 April) and a group of European stakeholders (workshop on 28 April – list of participants in annex 3). Both groups confirmed that the figures collected from the survey appear reasonable and form a good basis for the ex-ante impact assessment for the Rules for participation of Horizon 2020.

It can therefore be concluded that the online survey on administrative costs for managing grants under the FP7 has allowed gathering valuable and reliable information, providing:

- A tool to quantify the administrative efforts of the beneficiaries – 'What is behind' processes and tasks requested or proved necessary throughout the life cycle of EU funded projects is now properly evidenced.
- A tool to test options or to build scenarios for future funding of projects at European level, e.g. calls set-up, project duration, size of projects, frequency of reporting, cost reimbursement rules, etc.
- A tool that may be used to improve also the management of the remaining FP7 activities.

11.2 Main findings

The figures show that the major burden always lies with the coordinator. The difference with other partners is most important for the negotiation & GA signature phase and the project management phase (see annexes 1 and 2).

Type of beneficiaries, country or level of experience with EU funding do not show very marked differences, exception made for coordinators and mono-beneficiaries who participate in more than one FP7 project; they appear to benefit from a certain learning effect, that would be arguing for some continuity and stability in the rules and their implementation.

The largest potential for administrative burden reduction is within the grant management phase, including the "soft" law and rules and the way these are implemented in practice by the services.

11.3 Illustrative examples

11.3.1. Average small-scale collaborative project

Based on the median values for the different tasks, two virtual typical model projects were constructed. A 3-year collaborative project involving 9 partners and receiving € 3.000.000 EU contribution, with 2 reporting periods of 18 months (with only 1 CFS to be provided by each beneficiary), 1 technical review and 1 amendment, would typically imply the following administrative workload, expressed in number of working days, on the part of the beneficiaries:

	Proposal phase	Negotiation phase	Grant management phase	Total project (3 year + 1 year TTG)	
For the coordinator	51	38	185	**274**	**14 person-months**
For each partner (n = 8)	23	11	60	**94**	**5 person-months**

If figures are given per year (total divided by 3 years project duration + 1 year time-to-grant), the coordinator would typically have to employ 1/3 full-time equivalent over the duration of the project for fulfilling the administrative tasks and the 8 partners together 4/5 full-time equivalent (10 person-months per year)**, i.e. the administrative work in the project in total would require slightly more than 1 full-time equivalent**.

In case a beneficiary in this project is audited, 13 or 9 working days are also to be added depending on the role in the project (coordinator or partner).

The figures show that the major burden lies with the coordinator. In an average small-scale collaborative project, the coordinator has to spend 3 times the administrative effort of each individual partner. The difference with regular partners is most important for the negotiation & GA signature phase and the project management phase. The management of the grant is the phase requiring the majority of the administrative effort. For coordinators, about 67% of the overall effort is linked to this phase, while proposal preparation and submission, and grant negotiation ex-post audit mobilise 19% and 14% respectively. If the coordinator is audited, figures become 64% for grant management and reporting, 18% for proposal preparation and submission, 13% for grant negotiation and 5% for ex-post audit.

11.3.2. Average large-scale collaborative project

A 4-year collaborative project involving 20 partners receiving a total € 12.000.000 EU contribution, with 4 reporting periods of 12 months (with 4 CFS for the coordinator and 2 CFS for each partner), 2 technical reviews and 2 amendments, would typically imply the following administrative effort, expressed in number of working days, on the part of the beneficiaries:

	Proposal phase	Negotiation phase	Grant management phase	Total project (4 years + 1 year TTG)		Total per year	(Audit stage)
For the coordinator	74	57	390	**521**	26 person-month	**5,20 person-month**	(16)
For each partner (n = 19)	23	11	93	**127**	6 person-month	**1,25 person-month**	(9)
Total project	509	264	2170	**2943**	147 person-month	**29,5 person-month**	(187)

A Coordinator of a large-scale collaborative project typically invests 4 times more administrative effort than a partner. This coordinator also spends more time per year (5,20 person-month) than a coordinator of a small-scale collaborative project (3,50 person-month).

Changing the duration from 4 years to 5 years while keeping similar other settings gives a total effort of 170 person-month for the entire duration of the project (28,4 person-month per year).

In case a beneficiary in this project is audited, 16 or 9 working days are also to be added depending on the role in the project (coordinator or partner).

11.3.3 Grant decisions instead of grant agreements

For the project negotiation and grant agreement signature phase, survey results indicate that using grant decisions instead of grant agreements would save:

- Up to 1 working day per beneficiary
- 4 working days for coordinators

11.3.4. Fewer reporting periods

For the grant management and reporting phase, survey results indicate that one reporting period less would save:

- About 32, 27 and 25 working days at least (without CFS) for coordinators of large-scale, medium-scale and small-scale collaborative projects respectively (i.e. always more than 1 person-month)
- About 10 working days for each partner

11.4. Potential for administrative burden reduction

A number of points have been highlighted by the survey and in the discussions during the 2 validation workshops mentioned under point 11.1.

- **Two-stage calls** that prove to save 60% working time on average for failing applicants, are positively perceived although they are not necessarily adequate for all types of actions and there are certain risks that need to be carefully analysed. In particular, two-stage calls should not result in a longer time-to-grant, especially when time is a crucial element in the area of the call (i.e. innovation). The two-stage approach seems appropriate for broad topics and certain areas while the one-stage approach appears better suited for narrow topics or topics that require short time-to-market.

- On the question of **researchers' time recording**, there is a general consensus on the need for a verifiable time-allocation system for justifying the personnel costs charged to the project budget in the context of actual costs grants. Nevertheless, Commission requests should be kept simple and clear. The Commission is also called to be flexible towards the different time-allocation systems at the beneficiaries and accept, for as far as possible, their usual management practices.

- In addition to decisions and rules for Horizon 2020, **internal management processes** such as work programme content and calls set-up or project officers' negotiation and management practices offer significant possibilities for simplification and reduction of the administrative workload of the beneficiaries.

- Clear preferences regarding the 3 potential scenarios (see point 8.1) became apparent in the discussions in the two workshops. In general terms, **scenario three (simplified actual costs) gathers the most positive views, if combined with a harmonised application of the rules and improved communication and assistance to participants**. The other two scenarios are perceived as alternatives for specific projects/partners or if proposed as options alongside scenario 3.

12. Administrative effort in financial terms – Application of the standard cost model

12.1 Secretariat General methodology

The last step of the impact assessment analysis consists of translating administrative efforts into financial estimates.

The methodology provided by the Secretariat General (SecGen) implies using the standard cost model, i.e. assessing administrative costs "*on the basis of the average cost of the required administrative activity (Price) multiplied by the total number of activities performed per year (Quantity). The average cost per action will be generally estimated by multiplying a tariff (based on average labour cost per hour including prorated overheads) and the time required per action. […] The quantity will be calculated as the frequency of required actions multiplied by the number of entities concerned. In case of multiple relevant administrative activities per information obligation these need to be summed up to calculate the administrative cost per information obligation. The core equation of the SCM is as follows:*

Σ P x Q

where ***P*** *(for Price) = Tariff x Time and*
Q *(for Quantity) = Number of businesses x Frequency)*"
(http://ec.europa.eu/governance/impact/commission_guidelines/docs/ia_guidelines_annexes_en.pdf).

The SecGen also provides services with a table on tariffs/gross earnings per hour in 27 Member States (see http://adminburden.sg.cec.eu.int/calculator.aspx). This table distinguishes between 9 different staff categories: 1) Legislators, senior officials and managers, 2) Professionals, 3) Technicians and associate professionals, 4) Clerks, 5) Service workers and shop and market sales workers, 6) Craft and related trades workers, 7) Plant and machine operators and assemblers, 8) Manual workers (agricultural and fisheries), 9) Elementary occupations.
Finally, from the same page, either an "Administrative Burden Calculator" or an "EU Standard Cost Model reporting sheet" are made available for calculating administrative costs in the context of Impact Assessments.

12.2. Application of the SecGen methodology to the Research & Innovation funding programmes – Costs for participating in typical average FP7 projects

The standard cost model was developed by SecGen mainly for assessing the burden on citizens, enterprises, etc. caused by legislation, i.e. by legal information obligations that they have to fulfil. The current FP7 and Horizon 2020 are expenditure programmes, i.e. they do not create any legal obligations on citizens and organisations (nobody is obliged to participate). Nonetheless, beneficiaries invest working time when participating in FP7 projects, not only for purely administrative tasks (form filling, financial accounting, etc) but also, as detailed under sections 3-6, for tasks such as developing the scientific-technical content of a proposal, adapting this content during the negotiation phase, managing the consortium or dealing with scientific reporting, ethics, gender, dissemination and stakeholders involvement at project implementation phase. This overall effort for participation corresponds to costs that beneficiaries have to support (some of which are partially reimbursed by the programme). Applying the standard cost model allows to estimate these participation costs.

As projects have duration of multiple years and undergo different stages and settings, the straight application of the standard cost model methodology to an expenditure programme is not possible. The reporting sheet provided by the SecGen (see above) in our case would not provide any

meaningful global financial figures in relation with the range and variety of data gathered on beneficiaries' administrative efforts.

As an alternative, better adapted to the special situation of a complex funding programme, participation costs for a set of typical average projects, corresponding to the five most common actions funded under FP7, were calculated. On the basis of available information (CORDA database), average FP7 projects have been defined as follows:

Project features at the implementation stage	1. Small-scale Collaborative project	2. Large-scale Collaborative project	3. SMEs project	4. Marie Curie Individual Fellowship	5. ERC grant (monobeneficiary)
Duration (years)	3	5	3	2	5
Number of partners in the consortium	9	20	9,3	1	1
Average EU contribution (Mio Euros)	2,4	9,8	1,2	0,2	1,6
Yearly interaction with Project Officer(s) (on top of the periodic reporting)	3	5	3	2	5
Yearly dealing with horizontal issues, including communication, dissemination of results, ethical and gender issues, stakeholders involvement etc.	3	5	3	0	0
Yearly administrative management of the project (i.e. read guidance, instruct staff on requirements and ensure compliance)	3	5	3	2	5
Contribution to the scientific-technical part of a periodic report (Partners)	2	5	2	0	0
Preparation and submission of a financial statement for a periodic report	2	5	2	1	4
Preparation and submission of a periodic report (scientific and financial parts)	2	5	2	0	1
Provision of a certificate on the financial statements	25%	25%	25%	0%	25%
Distribution of an interim payment	2	5	2	0	0
Project technical review at the request of the Commission	1	2	1	0	1
Amendments to Grant Agreement	1	2	1	2	2
Own contribution to the final report (Partners)	1	1	1	0	0
Preparation and submission of the final report	1	1	1	1	1

With this approach, it is also possible to modulate the above settings (e.g. if changing the standard duration of reporting periods, or if modifying the number of certificates on the financial statements by changing the FP7 threshold of € 375.000) and estimate the impact of such changes on the project total participation costs. It is therefore possible to assess potential impact of envisaged options for simplified rules for participation and dissemination for Horizon 2020 on these participation costs

Gross earnings per hour in 27 Member States provided by SecGen (see above) for staff categories "2) Professionals" and "3) Technicians and associate professionals" can be used as weighted averages that reflect the proportion of MS participation in FP7, giving respectively values of € 38, 71 and € 26,02 per hour (table below).

Member State	2: Professionals	Share of EU-27 total FP7 participations (up to March 2011 - Source CORDA)	3: Technicians and associate professionals	Share of EU-27 total FP7 participations (up to March 2011 - Source CORDA)
Belgium	35,25	4,68%	27,34	4,68%
Bulgaria	2,24	0,75%	1,94	0,75%
Czech Republic	7,74	1,36%	6,28	1,36%
Denmark	45,40	2,25%	38,41	2,25%
Germany	43,15	15,66%	31,12	15,66%
Estonia	7,83	0,52%	5,83	0,52%
Ireland	45,94	1,52%	32,86	1,52%
Greece	21,00	3,46%	15,15	3,46%
Spain	23,94	8,38%	18,72	8,38%
France	47,02	11,36%	26,79	11,36%
Italy	59,26	10,41%	25,07	10,41%
Cyprus	20,29	0,42%	15,72	0,42%
Latvia	5,81	0,32%	5,36	0,32%
Lithuania	6,06	0,41%	4,23	0,41%
Luxembourg	41,58	0,18%	34,33	0,18%
Hungary	7,78	1,54%	6,12	1,54%
Malta	13,21	0,19%	11,39	0,19%
Netherlands	35,19	6,47%	27,85	6,47%
Austria	38,75	2,89%	29,21	2,89%
Poland	10,37	2,11%	5,78	2,11%
Portugal	19,32	1,88%	13,93	1,88%
Romania	5,97	1,05%	4,30	1,05%
Slovenia	18,75	0,87%	11,97	0,87%
Slovakia	5,19	0,51%	4,34	0,51%
Finland	34,74	2,49%	26,71	2,49%
Sweden	40,47	4,04%	31,29	4,04%
United Kingdom	49,75	14,26%	36,56	14,26%
Average weighted along % of FP7 participation	**38,71**		**26,02**	

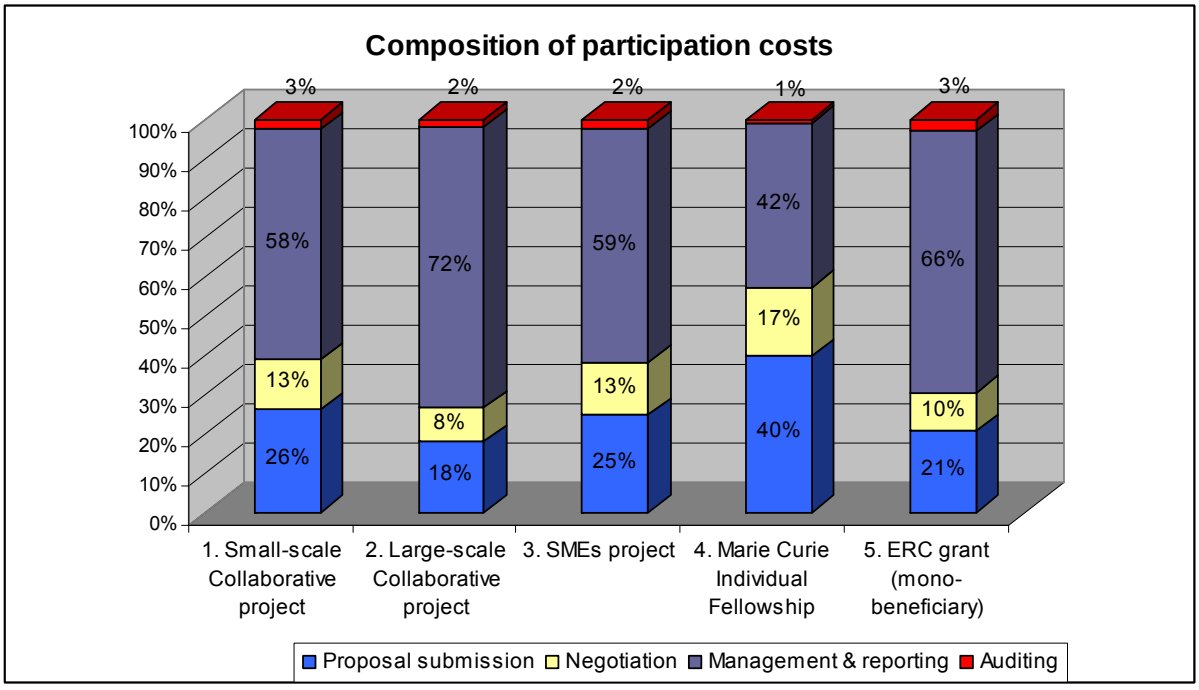
Combining these inputs (Quantity and Tariff) with the working times established through the survey (Time) gives the following estimates of **total participation costs in an FP7 average project**:

	Without audit (stages 1 to 3)	With ex-post audit (stages 1 to 4)[1]
1. Small-scale collaborative project (9 partners)	€ 277.000	**€ 284.000**
2. Large-scale collaborative project (20 partners)	€ 884.000	**€ 902.000**
3. SMEs project (9 partners)	€ 303.000	**€ 310.000**
4. Marie Curie Individual Fellowship (1 partner)	€ 18.000	**€ 18.250**
5. ERC grant (mono-beneficiary) (1 partner)	€ 36.000	**€ 37.000**

In these figures, it is assumed that the majority of project tasks are fulfilled by staff category "2) Professionals", leaving only a limited number of support tasks to be fulfilled by staff category "3) Technicians and associate professionals", mainly during the grant management and reporting phase.

The **composition of participation costs** show that tasks linked to the grant management and reporting phase represent the main part of the costs, ranging from 42% in MC individual fellowships to 72% in large-scale collaborative projects. This last percentage is to be linked to the project duration that entails more recurrent tasks/processes taking place. Similar situation applies to ERC grants that also last for 5 years on average.

	1. Small-scale CP	2. Large-scale CP	3. SME project	4. MC individual Fellowship	5. ERC grant (mono-beneficiary)
Proposal preparation & submission	75.000	163.000	77.000	7.000	8.000
Project negotiation & grant agreement signature	36.000	76.000	42.000	3.000	4.000
Grant management & reporting	166.000	645.000	184.000	8.000	24.000
Auditing	7.000	18.000	7.000	250	1.000
Total	284.000	902.000	310.000	18.250	37.000



1 Taking into account the current % of audited projects.

12.3 Cost for unsuccessful applicants

Estimating the average effort and the associated costs when preparing and submitting a typical FP7 average proposal is important for considering the costs for unsuccessful applicants. Data appear as follows:

	Person-days	Costs
1. Small-scale collaborative project (9 partners)	280	€ 75.000
2. Large-scale collaborative project (20 partners)	612	€ 163.000
3. SMEs project (9 partners)	294	€ 77.000
4. Marie Curie Individual Fellowship (1 partner)	26	€ 7.000
5. ERC grant (mono-beneficiary) (1 partner)	28	€ 8.000

On the basis of these data, it is possible to estimate that **a FP7 failing applicant will have invested € 8.000 on average** when responding to a single stage call. In case of a two-stage call, costs invested by applicants failing to pass to the second stage are cut by 50% for mono-beneficiaries and by 60% for partners, amounting then to € 4.000 and € 3.200 respectively (taking into account the distribution of effort between first and second stage as reported under point 3.1.3).

Unsuccessful coordinators spend more time than average unsuccessful applicants, with associated costs ranging from € 15.000 for small-scale collaborative projects to € 22.000 for large-scale collaborative projects. These amounts are cut by 70% for coordinators whose proposal do not pass the 1st evaluation stage of two-stage calls (as indicated under point 3.1.3). Application costs are then limited to € 6.600 and € 4.500 respectively.

13. Annex 1 – Global statistics by roles and project phases

See separate excel file.
(Survey report_Annex 1_Roles.xls)

14. Annex 2 – Global statistics by instruments and project phases

See separate excel file.
(Survey report_Annex 2_Instruments.xls)

15. Annex 3 – List of participants

WORKSHOP ON IMPACT ASSESSMENT ON COMMON STRATEGY FRAMEWORK, Brussels, 28 April 2011 (CDMA - SDR1)

Nr	Last name/First name	ORGANISATION
1	GHENO Ilenia	AGE PLATFORM EUROPE
2	TRECA, Adrienne	ASD-EUROPE - AeroSpace and Defense Industries Association of Europe
3	WESTRUP, Marten	BUSINESSEUROPE
4	DE MOOR, Anne	DIGITALEUROPE
5	PERRY, Milly	EARMA - European Association of Research Managers and Administrators
6	HULL, Christopher John	EARTO - European Association of Research and Technology Organisations
7	TRUJILLO, Miguel	EBAN - European business angel network
8	JUDKIEVICZ, Daniel Michel	EIRMA - European Industrial Research Management Association
9	WATKINS, Michael	EIROFORUM - European Intergovernmental Scientific Research Organisations
10	LANGER, Michael	EOS - European Organisation for Security
11	TUFFS, Richard	ERRIN - European Regions Research and Innovation Network
12	BORRELL-DAMIAN, Lidia	EUA - Association of European institutions of higher education
13	ESTERMANN, Thomas	EUA - Association of European institutions of higher education
14	GODWIN, Simon Dr	EUCAR - European Council for Automotive R&D
15	LABISCH, Claudia	EUROHORCS - European association of the heads of research funding organisations (RFO) and research performing organisations (RPO)
16	CHATTERJEE, Kumardev	EYIF - European Young Innovators Forum
17	BERGMAN-TAHON, Anne	FEP - Federation of European Publishers
18	KRAAN, Niek	IGLO - Informal Group of RTD Liaison Offices
19	MADSEN, Jakob Just	IGLO - Informal Group of RTD Liaison Offices
20	BROWNE, Michael	LERU - League of European Research Universities
21	LAMBRECHT, Bruno	LERU - League of European Research Universities
22	LLOYD, James	LERU - League of European Research Universities
23	NOTARFONSO, Maurizio	SPES GEIE - 'Spread European Safety' Economic Interest Grouping
24	RABETGE, Doris	UEAPME - European Association of Craft, Small and Medium-sized Enterprises
25	TRAVAINI,Giorgio	UNIFE - The European Railway Industry

16. Annex 4 – Survey content (Questionnaire)

Administrative costs for managing grants under the 7th EU Framework Programme for Research and Technological Development (FP7)

PLEASE READ BEFORE STARTING
This survey is addressed to researchers and administrators participating in FP7 projects. Evidence on the administrative effort in FP7 projects is gathered and will be used to assess potential scenarios for simplifying the next EU research and innovation programme.
You are asked to provide some quantitative information and to add comments and give opinions on potential simplification options.
The survey is anonymous. You are nevertheless asked to provide some basic information that will allow proper analysis of the data collected.
We would be very grateful if you could spend 25-30 minutes of your time.
When responding, please note the following:

- Even if you are/were involved in more than one FP7 project, the questionnaire should be filled in with regard to one specific project, e.g. the one you are the most familiar with. You may also, if you are/were involved in several projects, fill in several forms, one for each project.
- Most of the questions are compulsory. Should you lack the respective information or should you not be concerned with some phase(s), please indicate "don't know" or not applicable ("0 person-day (N/A)").
- In estimating the figures for the survey, please consider the working time actually spent by your organisation for fulfilling administrative requirements (not the overall delays for the completion of the different phases).

By clicking on the "circled i" sign close to questions a box with help text appears.
For any question on this survey please send an e-mail to:
RTD-SURVEY-ADMINBURDEN@ec.europa.eu.
Many thanks for your contribution.
The survey team

0. General information on your organisation and your FP7 project

0.1 Your organisation type is: (compulsory) (at most 1 answer)

- O Higher or Secondary Education Establishment
- O Non-profit Research Organisation
- O Public body (excluding Research Organisations and Secondary or Higher Education Establishments)
- O Private for-profit entities (excluding Higher or Secondary Education Establishments)
- O Other

0.2 If your organisation type is "Other", please specify: (compulsory)

0.3 Is your organisation a Small or Medium-Sized Enterprise (SME)? (compulsory) (at most 1 answer)

- O Yes
- O No

0.4 Country of establishment of your organisation: (compulsory) (at most 1 answer)

- O Albania
- O Austria
- O Belgium
- O Bosnia & Herzegovina
- O Bulgaria
- O Croatia
- O Cyprus
- O Czech Republic
- O Denmark
- O Estonia
- O Italy
- O Latvia
- O Liechtenstein
- O Lithuania
- O Luxembourg
- O Malta
- O Montenegro
- O Netherlands
- O Norway
- O Poland

O Faroe Islands
O Finland
O Former Yugoslav Republic of Macedonia
O France
O Germany
O Greece
O Hungary
O Iceland
O Ireland
O Israel
O Portugal
O Romania
O Serbia
O Slovakia
O Slovenia
O Spain
O Sweden
O Switzerland
O Turkey
O United Kingdom
O Other

0.5 If your organisation is established in an "Other" country, please specify: (compulsory) (between 2 and 25 characters)

0.6 Role of your organisation in the project for which you respond to this survey: (compulsory) (at most 1 answer)

O Single beneficiary in a mono-partner project [MONO]
O Coordinator [COO]
O Partner [PARTNER]

0.7 [MONO] Type of project for which you respond to this survey: (compulsory) (at most 1 answer)

O Coordination and support action
O Support for 'frontier' research (ERC grant)
O Support for training and career development of researchers (Marie Curie Action)

0.8 [COO & PARTNER] Type of project for which you respond to this survey: (compulsory) (at most 1 answer)

O Collaborative project
O Networks of Excellence
O Coordination and support action
O Research for the benefit of specific groups (in particular SMEs)
O Combined project (Collaborative project and Coordination and support action)
O Support for 'frontier' research (ERC grant)
O Support for training and career development of researchers (Marie Curie Action)

0.9 [MONO & COO] Maximum EU contribution (in euros) for the project: (compulsory)

0.10 [COO & PARTNER] EU contribution (in euros) budgeted for your organisation in the project for which you respond to this survey: (compulsory)

0.11 [COO] Number of partners in the Consortium of the project for which your respond to this survey: (compulsory)

0.12 Your experience with EU funded research: (compulsory) (at most 1 answer)

O 1st participation in an EU funded project
O More than one participation but only in FP7
O Participation in previous FPs

1. Project Phase 1: Preparation and submission of the proposal

1.1 [ALL] How much working time did your organisation spend studying FP7 documentation for finding a suitable call and topic, and for assessing your eligibility to apply? (compulsory) (at most 1 answer)

1.2 [COO] How much working time did your organisation spend to set up the consortium? (compulsory) (at most 1 answer)

1.3 [MONO] How much working time did you spend to make the arrangements with your host institution? (compulsory) (at mot 1 answer)

1.4 [PARTNER] How much working time did your organisation spend to find suitable partners/consortium? (compulsory) (at most 1 answer)

1.5 [ALL] How much working time did your organisation spend to get registered and validated as a legal entity via the Participant Portal/Unique Registration Facility? (compulsory) (at most 1 answer)

1.6 [MONO & COO] How much working time did your organisation spend for developing the scientific-technical content of your project (part B of your proposal)? (compulsory) (at most 1 answer)

1.7 [PARTNER] How much working time did your organisation spend for developing your part of the scientific-technical content of the project (part B of the proposal)? (compulsory) (at most 1 answer)

xx [ALL] Was the call to which you submitted a two-stage call? (compulsory) (at most 1 answer)

- O Yes
- O No
- O Don't know

xx [ALL] Which part of the overall working time for preparing the proposal (stage 1 and 2) can be attributed to stage 1 only? (compulsory) (at most 1 answer)

- O about 10%
- O about 20%
- O about 30%
- O about 40%
- O about 50%
- O about 60%
- O about 70%
- O about 80%
- O about 90%
- O about 100%

1.8 [MONO & COO] How much working time did your organisation spend to complete and submit the proposal information in the electronic proposal submission system (completion of part A - Administrative forms and upload of part B - Proposal content)? (compulsory)

1.9 [PARTNER] How much working time did your organisation spend to connect to the online submission system and fill in the administrative forms (part A of the proposal) for your organisation? (compulsory) (at most 1 answer)

1.10 [COO] How much working time did your organisation spend to prepare and participate in a hearing on your proposal during the evaluation phase? (compulsory) (at most 1 answer)

1.11 [ALL] Do you identify any other process/task in the phase of proposal preparation and submission that has caused significant administrative effort? (compulsory) (at most 1 answer)

O Yes

O No

1.11' Please detail (compulsory if Yes) (maximum 300 characters)

1.11" How much working time did your organisation spend to complete this other process/task? (compulsory if Yes) (at most 1 answer)

xx [ALL] Please provide below any comment that you might have related to the administrative effort for preparing and submitting your FP7 proposal? (optional) (maximum 1000 characters)

2. Project Phase 2: Negotiation of the project and Grant Agreement signature

2.1 [ALL] How much working time did your organisation spend to analyse guidance documents (Evaluation Summary Report, Negotiation letter, Negotiation Guidance Notes, FP7 Guide to Financial Issues, model Grant Agreement, etc.)? (compulsory) (at most 1 answer)

2.2 [COO] How much working time did your organisation spend to prepare and attend a negotiation meeting with the Commission? (compulsory) (at most 1 answer)

2.3 [COO] How much working time did your organisation spend to interact with your Consortium partners, including the development of the consortium Agreement? (compulsory) (at most 1 answer)

2.4 [MONO] How much working time did you spend to make the arrangements with your host institution? (compulsory) (at most 1 answer)

2.5 [COO] How much working time did your organisation spend to adapt the project content (Description of Work - Annex I to Grant Agreement) to the recommendations in the negotiation mandate, including horizontal issues such as dissemination and exploitation of results, communication, gender or ethical issues? (compulsory) (at most 1 answer)

2.6 [PARNER] How much working time did your organisation spend to adapt your part of the project content (Description of Work - Annex I to Grant Agreement) to the recommendations in the negotiation mandate, including interaction with the Consortium partners? (compulsory) (at most 1 answer)

2.7 [ALL] How much working time did your organisation spend to complete the information in the online negotiation tool NEF? (compulsory) (at most 1 answer)

2.8 [ALL] How much working time did your organisation spend to provide the information necessary for the Financial Capacity Check? (compulsory) (at most 1 answer)

2.9 [ALL] How much working time did your organisation spend to have the Grant Agreement/Form A signed by the authorised representative of your organisation? (compulsory) (at most 1 answer)

2.10 [COO] How much working time did your organisation spend to finalise the Grant Agreement signature process (including collection of access forms signature(s) from all other beneficiaries)? (compulsory) (at most 1 answer)

2.11 [COO] How much working time did your organisation spend to distribute the EU pre-financing? (compulsory) (at most 1 answer)

2.12 [ALL] Do you identify any other process/task in the phase of grant negotiation and signature that has required significant administrative effort? (compulsory)

O Yes

O No

2.12' Please detail (compulsory if Yes) (maximum 300 characters)

2.12" How much working time did your organisation spend to complete this other process/task? (compulsory if Yes) (at most 1 answer)

xx [ALL] Please provide below any comment that you might have related to the administrative effort for negotiating and signing your Grant Agreement (optional) (maximum1000 characters)

3. Project Phase 3: Grant management and project reporting

Please limit your replies to management tasks specifically linked to an EU funded project, i.e. excluding those management tasks which arise for any research project, irrespective of its source of funding.

3.1 [MONO & COO] How much working time did your organisation typically spend per year to interact with your Commission/REA/ERCEA Project Officer(s) during the implementation of your project (on top of the periodic reporting)? (compulsory) (at most 1 answer)

3.2 [COO] How much working time did your organisation typically spend per year to deal with horizontal issues for your FP7 project, including communication (e.g. a dedicated web site), dissemination of results, ethical and gender issues, stakeholders' involvement etc.? (compulsory) (at most 1 answer)

3.3 [ALL] How much working time did your organisation typically spend per year for the administrative management the project (i.e. read guidance, instruct staff on requirements and ensure compliance with e.g. time-recording, archiving, sub-contracting procedures)? (compulsory) (at most 1 answer)

3.4 [PARTNER] How much working time did your organisation typically spend to prepare your contribution to the scientific-technical part of a periodic report? (compulsory) (at most 1 answer)

3.5 [ALL] How much working time did your organisation typically spend to prepare and submit your financial statement for a periodic report, including potential requests from the Commission for refinement/correction/completion? (compulsory) (at most 1 answer)

3.6 [MONO & COO] How much working time did your organisation typically spend to collect contributions from partners (if applicable) and assemble and submit a periodic report (scientific and financial parts), including potential requests from the Commission for refinement/correction/completion? (compulsory) (at most 1 answer)

xx [ALL] Did your organisation have to adapt its usual accounting system for complying with the rules governing EU research grants? (compulsory) (at most 1 answer)

O Yes

O No

O Don't know

xx [ALL] Does your entity implement a time recording system for the researchers? (compulsory) (at most 1 answer)

O Always

O Only if requested by the customer/funder
O Only for EU projects
O Never
O Don't know

3.7 [ALL] How much working time did your organisation typically spend to provide a certificate on the financial statements? (compulsory) (at most 1 answer)

3.8 [COO] How much working time did your organisation typically spend to distribute an interim payment? (compulsory) (at most 1 answer)

3.9 [COO] How much working time did your organisation typically spend to undergo a project technical review at the request of the Commission? (compulsory) (at most 1 answer)

3.10 [COO] How much working time did your organisation spend to prepare amendments to your Grant Agreement? (compulsory) (at most 1 answer)

3.11 [PARTNER] How much working time did your organisation spend to prepare your contribution to the final report? (compulsory) (at most 1 answer)

3.12 [MONO & COO] How much working time did your organisation spend to assemble and submit the final report? (compulsory) (at most 1 answer)

3.13 [ALL] Do you identify any other process/task in the phase of grant management and reporting that has required significant administrative effort for your organisation? (compulsory) (at most 1 answer)
O YES
O NO

3.13' Please detail (compulsory if Yes) (maximum 300 characters)

3.13" How much working time did your organisation spend to complete this other process/task? (compulsory if Yes) (at most 1 answer)

xx [ALL] Please provide below any comment that you might have related to the administrative effort for managing your FP7 grant and fulfilling project reporting requirements (optional) (maximum 1000 characters)

4 Project Phase 4: Auditing of the project

This section addresses only audited projects or audited participations in FP7 projects.

xx Has your project been audited? (compulsory) (at most 1 answer)
O Yes
O No
O Don't know

4.1 How much working time did your organisation spend to interact with auditors? (optional if Yes to 5.1) (at most 1 answer)

4.2 How much working time did your organisation spend to gather the necessary information/documentation? (compulsory if Yes to 5.1) (at most 1 answer)

4.3 How much working time did your organisation spend to ensure audit follow-up and implementation of audit results? (compulsory if Yes to 5.1) (at most 1 answer)

4.4 Do you identify any other process/task in the phase of auditing that has required significant administrative effort? (compulsory if Yes to 5.1) (at most 1 answer)

O Yes

O No

4.4' Please detail (compulsory if Yes to 5.5) (maximum 300 characters)

4.4'' How much working time did your organisation spend to complete this? (compulsory if Yes to 5.5) (at most 1 answer)

xx Please provide below any comment that you might have related to the administrative effort related to audits on your FP7 grant (optional) (maximum 1000 characters)

6. Simplification options for the future EU research and innovation programme

6.1 Scenario 1: Project-specific lump sums for entire projects

A change from the current system based on reporting and reimbursement of actual costs towards a system of project-specific lump sums for entire projects that are agreed for each project in the negotiation, and payment of the EU financial contribution against the delivery of output/results. This implies no more cost reporting and no more financial auditing but a closer scientific/technical assessment of the projects and their output/results.
In this scenario, lump sums are global amounts, fixed ex-ante and based on an estimate of expected inputs. They replace the "actual costs" model and reduce the amount of detailed checking before payment, and result in no need for financial audits.

	No reduction	Up to 10% reduction	Up to 30% reduction	Up to 50% reduction	More than 50% reduction	Increase instead of reduction
Proposal preparation and submission:	O	O	O	O	O	O
Grant negotiation and signature:	O	O	O	O	O	O
Grant management and reporting:	O	O	O	O	O	O
Ex-post auditing:	O	O	O	O	O	O

Please give your appreciation on scenario 1 (optional) (maximum 1000 characters)

6.2 Scenario 2: Extended use of flat rates, lump sums and scales of units

The extended use of flat rates, lump sums and scales of units for selected cost categories (notably for personnel, travel, consumables, etc.), replacing the reporting of actual costs. In this scenario, reporting on generating events (hours worked, days of business trips made, etc.) would still be necessary but the actual costs related to these items would no longer be reported.
Flat rates are standard percentage rate applied to actual costs (i.e. indirect costs calculated on the basis of a percentage of direct costs incurred) or standard scale-of-unit costs (i.e. standard amounts per unit of input (e.g. a "person-day")). Scale-of-unit costs may be unique or applied with a corrective coefficient per country.

	No reduction	Up to 10% reduction	Up to 30% reduction	Up to 50% reduction	More than 50% reduction	Increase instead of reduction
Proposal preparation and submission:	O	O	O	O	O	O
Grant negotiation and signature:	O	O	O	O	O	O
Grant management and reporting:	O	O	O	O	O	O
Ex-post auditing:	O	O	O	O	O	O

Please give your appreciation on scenario 2 (optional) (maximum 1000 characters)

6.3 Scenario 3: Continuation of current cost reporting approach but with a simplification of the cost eligibility criteria

A continuation of the current approach based on reporting of actual costs (with a limited use of flat rates and lump sums) but with a simplification of the cost eligibility criteria, allowing for a broad acceptance of the usual accounting and management practices of the beneficiaries.

	No reduction	Up to 10% reduction	Up to 30% reduction	Up to 50% reduction	More than 50% reduction	Increase instead of reduction
Proposal preparation and submission:	O	O	O	O	O	O
Grant negotiation and signature:	O	O	O	O	O	O
Grant management and reporting:	O	O	O	O	O	O
Ex-post auditing:	O	O	O	O	O	O

Please give your appreciation on scenario 3 (optional) (maximum 1000 characters)

6.4 If you consider another research funding programme to be more simple and efficient than FP7, please indicate the name of this programme and if possible the funding organisation (optional) (maximum 300 characters)

6.5 When compared with FP7, that programme has (tick all options that apply): (optional) (at most 6 answers)

- O Simpler financial rules
- O Better IT tools
- O Lighter and quicker procedures (to submit proposals and to negotiate and implement projects)
- O Fewer reporting requirements
- O Fewer audits
- O Better evaluation system leading to granting better projects

6.6 What would be your number 1 priority for one concrete and feasible simplification measure in the programme succeeding to FP7? (optional) (maximum 500 characters)

(You may also refer to the content of the Communication on simplification - see Background documents section)

7. Potential follow-up to this survey

Thank you very much for completing the questionnaire.
You can choose to stay anonymous but we would be very grateful if we could recontact you in a second phase of the survey.
If you agree to this, please provide below an e-mail address: (optional) (between 4 and 100 characters)

Useful links

Legal and guidance documents for the 7th Framework Programme:
http://cordis.europa.eu/fp7/find-doc_en.html
Participant Portal:
http://ec.europa.eu/research/participants/portal/appmanager/participants/portal
Research and FP7 on EUROPA:
http://ec.europa.eu/research/fp7/index_en.cfm
EU Financial Regulation:
http://europa.eu/legislation_summaries/budget/l34015_en.htm
Privacy statement for this consultation:
http://ec.europa.eu/research/pdf/privacy/a3-admincosts-privacy-statement.pdf

Background documents

Communication on Simplification (April 2010):
http://ec.europa.eu/research/fp7/pdf/communication_on_simplification_2010_en.pdf

ANNEX 2 - RESULTS OF THE SURVEY ON ADMINISTRATIVE COSTS OF PARTICIPANTS IN FP7

Deloitte.

European Commission

Directorate-General Research and Innovation

Assessing the Effectiveness of Simplification Measures under FP7

Final Report

June 2011

CONTENTS

FIGURES

TABLES

1. EXECUTIVE SUMMARY

1.1. Objectives of the study

Since the Seventh Framework Programme (FP7) was launched, the Commission has been working on simplifying its administrative and financial rules, in order to make participation in the Framework Programme easier. 15 simplification measures were initially designed and implemented in this context, and to underline the importance which it attributes to the issue, the Commission has continued to review and act on simplification initiatives on an ongoing basis. The recent interim evaluation[1] of FP7 also drew significant attention to the simplification imperative.

FP7 nevertheless still has the reputation of being complex, with the risks that:

- researchers participating in FP7 projects spend too much time, and budget on administering these projects, while this time and money could have been better spent on research activities; and
- some might even be discouraged from taking part in the Programme because of the complexity and administrative burden linked to participation in FP7. The Interim Evaluation Expert Group finds that "'complication' continues to deter (and exasperate) researchers and, especially, can be a daunting obstacle to effective industry participation"[2].

This study assessed the effectiveness of the simplification measures undertaken in FP7 and developed recommendations for both the current and future European research programmes.

1 Interim Evaluation of the Seventh Framework Programme, Report of the Expert Group, Final Report 12 November 2010 (http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/fp7_interim_evaluation_expert_group_report.pdf)
2 *Ibid.*

1.2. Methodology

The study's analysis was based on qualitative information from:

- desk research, including the contributions received by the Commission in the public consultation on simplification in FP7[3];
- interviews with 90 FP7 participants; and
- interviews with representatives from three large research-funding organisations[4].

The initial findings were discussed both in a workshop with Commission project officers, and in a round table meeting with FP7 stakeholders involved in the simplification debate.

The study also collected quantitative data from FP7 participants, in particular related to the time spent by coordinators and work package leaders in handling the key administrative steps in the FP7 life cycle (namely, application/selection, negotiation, project management and ex-post audits).

The Commission carried out parallel data collection on time spent administering FP7 projects through an online consultation[5]. This additional data will complement the study, benefiting from a much larger sample of participants.

1.3. Main findings and recommendations

While stakeholders understand that a programme such as FP7 is complex *per se,* and that the measures introduced to date are not a panacea, they still see significant room for improvement. Simplification remains a key challenge in their minds.

3 Ideas for simplifying the implementation of the EU Framework Programmes, in preparation of the 2010 Communication on simplification, 2009, Summary of outcomes.
4 National Science Foundation (USA), German Deutsche Forschungsgemeinschaft (DFG Germany), and the French National Research Agency (ANR France).
5 Survey on administrative costs for participants in the 7th EU Framework Programme for Research and Technological Development (FP7).

Of the 15 simplification measures introduced since FP7 was proposed in 2005, eight affect the project life cycle transversally, while seven affect one specific project life cycle step (either application/selection, negotiation, audit or project management).

Of these 15 measures, the most successful have been, according to participants and stakeholders:

- the introduction of a unique registration facility (URF);
- a major reduction in the number of certificates related to financial statements that must be provided with periodic claims;
- a considerable reduction in ex-ante controls and revised protective measures for financially weaker participants; and
- the extension of lump sum financing for subsistence and accommodation costs.

These measures should naturally be kept in place, and strengthened in the future where appropriate.

However, other measures (that were considered as potentially important by stakeholders) are not perceived as having been successfully implemented:

- the introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants (very few certifications were delivered);
- a clearer definition of eligible costs, and improvements to the services and guidance documents for applicants (the definition of eligible costs remains unclear, and the many documents available remain difficult for newcomers to understand);
- a simpler cost reporting system (reporting remains complex); and
- a simplified support rate per type of activity (participants may face several support rates depending on the type of funding scheme that applies to them).

Given the potential impact of these measures if implemented effectively, the Commission should continue to focus on improvements in these areas.

Following the study results, the most time-consuming project life cycle step for participants is project management, followed by application/selection, negotiation and audit in terms of administrative obligations (the time spent on scientific tasks is not included). Project coordinators spend almost as much time writing the application as they do managing the project[6]. Simplification efforts will obviously have most effect if they are targeted on these most time-consuming steps.

6 The data collection conducted by the Commission on time spent when participating in FP7 projects via the online consultation mentioned here above shows different results as compared to the findings of this study, due to methodological differences between both surveys. This study only covers projects of the Cooperation Programme (no mono beneficiary projects such as Marie Curie, Coordination and Support Action, etc.). The scope of the Commission's online consultation was much broader in this respect. Furthermore, this study only collects data on time spent for administrative obligations and does not include the time spent on scientific tasks

It is not surprising that participants with prior experience of the Framework Programme are at an advantage compared to newcomers, even beyond the "normal" learning curve effect. They have experience in the administrative processes and can therefore spend less time on them.

However, if the complexity of the Framework Programme is not significantly reduced, high-potential research projects from less- or non-experienced researchers or from smaller organisations (such as SMEs) may be "missed" by the Programme and its successors.

In addition to these findings, the study identified the following simplification areas that merit serious attention by the Commission:

- remove differences of approach between Commission DGs and Directorates involved in FP7 (e.g. interpretation of rules, communication, training of Commission staff, etc…). A dedicated change management strategy in this respect and a coherent and holistic Business Process Management approach should be put in place to assure future consistency in approach between Directorates;
- simplify the 'rules for participation' by rationalising and reducing the number of funding schemes and cost models, remove the obligation to open a specific bank account for the project and implement the additional simplification measures listed by the Council on 12 October 2010[7];
- assess the feasibility of different options proposed for a "trust-based approach" to achieve a better balance between science and administration;
- offer the option of a direct contractual relationship only with the major partners in the consortium (instead of collaborative agreements). Small organisations and/or newcomers would be attracted by lighter administrative procedures, whereby they would have the status of subcontractors in a project and avoid more complex contractual procedures. The financial threshold above which audits become mandatory (EUR 375 000) could be an appropriate level of grant income below which participants could be subcontractors;
- align the administrative processes of FP7 with typical internal business processes of the beneficiaries. Ideally the Commissions internal business processes should be reengineered in such a manner that they establish a 'natural' link with the day-to-day business of participants, thus avoiding double work, irritation and additional administrative burden;
- publish "deadline-free" calls (calls that are continuously open and regularly assessed by an evaluation committee) in order to allow more flexibility for researchers;
- ensure the right balance between simplification and stability of the rules. If further simplification measures are selected, they should be tested against their stability over the next funding programmes. Ever-changing rules are often a cause of additional

(also for the preparation of the proposal), which is another clear difference as compared to the Commission's consultation. For further details, please see Section 2.2.1. and Annex 3.

administrative burden and irritation rather than a lever for removing the negative effects of red tape;

- ensure audit traceability throughout the project life cycle, so that certain project decisions can be explained and errors can be avoided in the future. Much discussion and confusion about project decisions could be avoided if any change or decision is well-documented throughout the project;
- ensure flexibility in the implementation of rules, taking into account country-specific financial rules;
- use communication as a powerful simplification tool. FP programmes should be supported by a user-friendly research participants' portal incorporating clear guidelines. In addition, all communication (e-mails, letters, phone calls, RTD magazines and publications, etc.) should be consistent and the terminology used should be harmonised.

Naturally, the Commission should be guided by continuous monitoring of the effects of simplification measures implemented to date. Useful indicators such as:

- time to grant;
- time to pay;
- time to reply;
- time to find the right information (calls, guidance documents, specific rules applying to these documents); and
- time spent by EC officers (project/legal/financial) as well as coordinators and project partners in managing each step of the project life-cycle

should be used to measure the impact of simplification measures already introduced – and to assess the likely effect of further steps. In order to achieve this, an integrated approach to internal performance management, linking clear performance indicators to the Commission's business processes, could be put in place.

The Commission introduced three further measures in January 2011[8], (averaging of personnel costs, flat rate financing of SMEs and natural persons, and the creation of an internal "Research Clearing Committee). These are evidence of the Commission's continued willingness to improve the processes. While the first two are likely to affect only a limited number of participants and the potential impact of the third step remains unclear, they are welcomed by the research world as evidence of continuing attention to the remaining issues.

One task for which the new Research Clearing Committee could become responsible is tackling discrepancies of approach within the Commission and for continuously monitoring

7 Council Conclusions on raising the attractiveness of EU Research and Innovation programmes: the challenge of simplification, 14980/10 of 12 October 2010 (http://register.consilium.europa.eu/pdf/en/10/st14/st14980.en10.pdf)

8 C(2011)174 Final Commission Decision of 24 January 2011 "on three measures for simplifying the implementation of Decision No 1982/2006/EC of the European Parliament and of the Council and Council Decision No 970/2006/Euratom and amending Decisions C(2007) 1509 and C(2007) 1625".

the achievement of simplification objectives. A successful initiative in centralisation of standardised and consistent communication, training of EC staff, the participants' portal, and consistency of interpretation of rules would improve the quality of the interactions with applicants and participants.

2. FINDINGS

This chapter presents our findings.

2.1. Achievements of simplification measures

This section focuses on the effectiveness of simplification measures implemented under FP7 so far. It provides:

- an overview of simplification under FP7 so far:
  - simplification objectives in FP7 (based on issues raised about FP6);
  - simplification measures implemented so far;
- a description of the FP7 project life cycle and an assessment of the effects of the simplification measures taken to date correlated with the project life cycle.

This findings section links the simplification measures already in place to the different steps in the life cycle, thus making it apparent where these were affected by simplification measures.

2.1.1. Assessment of the simplification measures under FP7

The generic project life cycle of FP7 depicted in Annex 4 (Figure 6) has been broken down into further detail below to reflect the different project steps undertaken by the Commission services as well as by the FP7 applicants and beneficiaries. These steps have been correlated with four phases in the project life cycle:

- Application (beneficiaries)/selection of proposals (Commission);
- Negotiation of contracts;
- Project management;
- Ex-post audits.

The table below provides an overview of simplification measures introduced when FP7 was launched and their implementation status at the time of the 2010 Communication on Simplification. The list does not include measures that have been announced after the data collection[9], nor the simplification measures that are not labelled as such nor perceived as such by participants, even though they may facilitate their activities (e.g. simplified procedure for amendments, letter of information, no more compulsory annual update of the 18 months implementation plan for large instruments, etc…).

The table links the simplification measures to the issues they are targeting, the simplification objectives, the status of their implementation and our summary findings on the way (positively, negatively or neutrally) they affect the project life cycle.

It also links the simplification measures to the project life cycle phase on which they are having an impact. It shows clearly that, although some measures have an impact on specific aspects of FP7, most have an impact across the board, i.e. throughout the life cycle.

Simplification measures affected both the Commission and applicants and participants, although the stated objective of the simplification measures was to facilitate the activities carried out by applicants and participants.

Findings and conclusions for each specific measure are summarised in the last column of the table below.

9 Measures adopted and announced in January 2011 will be addressed in Section 2.4.

Table 1: Overview of implementation measures introduced when FP7 was launched

Simplification measures	Simplification objectives[11]	Project life cycle phase	State of issues at the end of FP6	Implementation status	Findings and conclusions
Continuity of FP6 instruments while providing more flexibility of use	1- Simple set of funding schemes (continuity with the instruments of FP6 and flexibility of use)	Transversal	Multiple instruments for participation	New set of funding schemes in 2007, but not perceived as simpler	Neutral impact. The large number of instruments is still puzzling for participants
Improvements to the services and guidance documents for applicants	2- Consistent, high quality communication	Transversal	Multiple sources of information	Implemented in 2007: Reduced number of documents, these are valid across all DGs, but still issues in terms of clarity and organisation. Work programmes are adopted at the same time of the year	Neutral impact. Documents are still numerous, while understanding them is difficult for newcomers
Introduction of two-stage procedures	3-Rationalisation of the requests for information addressed to participants	Application/selection	Participation complex for newcomers and small players	Extended in 2007	Neutral impact. The two-stage procedure could be further extended
Introduction of a unique registration facility (URF)	3-Rationalisation of the requests for information addressed to participants	Application/selection	Participants required to submit the same information several times	URF created in 2007 integrated in the Participant Portal in 2008 with difficulties at the beginning	High (positive) impact initiative

11 Based on CSWD "simplification in the 7th framework programme" SEC 2005 431; http://cordis.europa.eu/documents/documentlibrary/72661501EN6.pdf .

Simplification measures	Simplification objectives[11]	Project life cycle phase	State of issues at the end of FP6	Implementation status	Findings and conclusions
Progress towards optimised IT tools ("e-FP7" the Participant Portal)	3-Rationalisation of the requests for information addressed to participants	Transversal	Participants required to submit the same information several times	e-FP7 took major steps in 2008 -2009 but is not completed yet	Neutral impact. e-FP7 is a major source of frustration because of continuous changes
Streamlining of the project reporting requirements	3-Rationalisation of the requests for information addressed to participants	Project management	Multiple reporting requirements leading to errors in reports	In 2007 the period between reports was extended from 12 to 18 months with reduced data requirements No need for amendments for simple changes to the grant agreement and contract that the coordinator can validate	Neutral impact. Only partially achieved, due to the issues remaining in the IT tools supporting the process
Considerable reduction in ex-ante controls and revised protective measures for financially weak participants (SMEs and high-tech start-ups)	4-Guaranteeing the protection of the Community's financial interest without imposing an undue burden on participants by reducing a-priori controls to a bare minimum	Negotiation	Participation is complex for newcomers and small players	80% of FP7 participants (those asking less than EUR 500 000) are exempt from ex-ante financial capacity check[12] since 2007	Positive impact. Participation is still too complex for newcomers and small players

12 Source: 2010 Communication on Simplification

Simplification measures	Simplification objectives[11]	Project life cycle phase	State of issues at the end of FP6	Implementation status	Findings and conclusions
Major reduction in the number of certificates on financial statements to be provided with periodic cost claims (below EUR 375 000)	5-Full operational autonomy entrusted to consortia	Project management	Multiple requirements for submission and reporting	75% of FP7 participants are exempt from providing certificates[13] since 2007.	High (positive) impact initiative
Introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants	5-Full operational autonomy entrusted to consortia	Transversal	Financial reporting is complex	Ex-ante certification for calculating personnel cost and for calculating indirect costs not implemented	Negative impact. Very limited number of organisations certified
No need to obtain validation by the Programme Committee of those selected	6-Streamlining the selection process	Application/selection	Multiple internal and external controls on expenditure of Community funds	Not implemented	Negative impact. Control is a difficult area in which to make progress
Revision of the Financial Regulation (to ensure broader flexibility of use of the budget dedicated to research policy)	7-More effective use of the budget dedicated to the research policy	Transversal	No synergies between funding programmes supporting research activities	Revision of the Financial Regulation under discussion	Neutral impact.
Extension of lump sum financing for subsistence and accommodation costs	8-Use of flat-rate financing within a simplified framework of forms	Transversal	Financial reporting is complex	Lump sums partially implemented in 2010	Positive impact. Financial rules are still complex, in particular the cost models

13 Source: 2010 Communication on Simplification

Simplification measures	Simplification objectives[11]	Project life cycle phase	State of issues at the end of FP6	Implementation status	Findings and conclusions
Simple cost reporting	9-Removing the need for complex cost reporting models and clarifying definition of eligible costs	Project management	Financial reporting is complex	Partially implemented in 2007	Neutral impact. Remains complex
Clearer definition of eligible costs	9-Removing the need for complex cost reporting models and clarifying definition of eligible costs	Transversal	Complex financial rules leading to errors in reports	Partially implemented in 2007	Neutral impact. Remains unclear for many participants
Simplified support rates per type of activity	10- Simplified support rates per type of activity	Transversal	Complex financial leading to errors in reports	Partially implemented in 2007	Neutral impact. Remains complex

Source: Deloitte 2011, based on SEC 431 (2005); first, second and third Monitoring Reports, (2009, 2009, and 2010); First two years subscription performance (2009); SEC 589 (2009); and COM 187 (2010)

2.1.2. Conclusions

The findings and conclusions in relation to achievements of simplification measures introduced under FP7 are:

- When FP7 was launched, the Commission announced ten simplification objectives with a series of measures linked to these objectives;
- The objective of FP7 simplification covered measures affecting the entire project life cycle:
    - Measures affecting only one step of the project life cycle, with the exception of the ex-post audits step, which is not specifically targeted by any measure;
    - Transversal measures affecting more than one project life cycle step.
- Some measures affected the project life cycle steps to a greater extent than others, such as:
    - the Unique Registration Facility;
    - the introduction of a minimum EUR 375 000 threshold for the requirement for an audit certificate, and
    - the guarantee fund which exempts participants from ex ante financial viability control below EUR 500 000.
- Some measures have not affected the project life cycle as planned, such as:
    - Introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants
    - No need to obtain validation by the Programme Committee of those selected[14]
- The other measures are still under implementation and therefore have not (yet) affected the project life cycle. These measures are, e.g.:
    - Improvements to the services and guidance documents for applicants;
    - Progress towards optimised IT tools ("e-FP7" the Participant Portal).
- An essential attention point here for the Commission is clear and organised communication of the implemented simplification measures, as this would increase the positive perception of these measures by stakeholders.

While overall, FP7 simplification measures have been partially successful, measures have not been perceived as helpful to increase participation of less represented target groups such as SMEs, newcomers and small players in general. As a consequence, FP7 is still perceived as a ‘closed shop’ for experienced participants.

This means that there is still substantial room for improvement to achieve the simplification objectives set when FP7 was launched. The Commission has been moving in the right direction, in particular with the further simplification measures announced in January 2011.

14 The measure ‘No need to obtain validation by the Programme Committee’ was not retained for FP7, hence there was no impact.

These measures, as well as further feasible ‘quick wins’ simplification opportunities with high (positive) impact on beneficiaries, will be discussed in the following sections.

2.2. Measuring relative time spent, effects and impacts of simplification measures introduced under FP7

This section provides:

- an overview of the relative time spent on administrative task within FP7 projects for both participants and EC;
- an analysis of the effects and impacts of simplification measures and an overview of data currently available to measure the effects and impacts of simplification measures;
- a presentation of measurement tools and techniques assessing to what extent they can be used in the context of FP7 (feasibility).

2.2.1. Relative time spent on administrative tasks within FP7

This section focuses on providing an overview of the application and management costs of FP7 projects for both participants and the European Commission. The interviews provide baseline quantitative data on the time spent on administrative tasks within the FP7 project life cycle for participants (applicants and participants) and qualitative data on participants' assessment of the simplification measures within FP7.

The Commission carried out parallel data collection on time spent when participating in FP7 projects through an online consultation[15].

The data collected via this online consultation show different results as compared to the findings of this study, as reported here below.

This is due to methodological differences. This study only covers projects of the Cooperation Programme (no mono beneficiary projects such as Marie Curie, Coordination and Support Action, etc.). The scope of the Commission's online consultation was much broader in this respect. Furthermore, this study only collects data on time spent for administrative obligations and does not include the time spent on scientific tasks, which is another clear difference as compared to the Commission's consultation. For further details, please see Annex 3.

15 Survey on administrative costs for participants in the 7th EU Framework Programme for Research and Technological Development (FP7).

As the long time frame of the FP7 project phases is not readily aligned with the detailed measurement approach of SCM (project phases can last for months; project activities are rarely detailed, and are mostly large), the study team applied an adapted version of the Standard Cost Model in order to fit the project's needs and to ensure that measurement data could be captured.

The team collected overall time data related to specific case studies, rather than conducting a full-fledged SCM measurement. Interviews with beneficiaries were related either to the entire project life cycle, part of the project life cycle, and/or specific topics such as FP7 administrative simplification measures. The key data collection unit was time (person-hours).

Even by applying this adapted approach, it turned out to be difficult for interviewees to give an accurate estimate of time spent, as it is difficult for anyone to give an accurate estimate of time spent on:

- Activities that happened a long time ago;
- Activities that ran over months/years;
- Activities that involved time spent by a large number of people/organisations.

The figures collected should, therefore, be seen as indicative of the relative cost of the different steps in the project life cycle.

The following table provides the cost in terms of hours for the four steps of the project lifecycle. Data are presented separately for coordinators (23 interviews) and work package leaders (26 interviews).

Table 2: Average time spent by participants in hours, 2011

Project life cycle steps	Average time spent by coordinators per project phase	Average time spent by work package leaders
Application/ selection of proposal	365	80
Negotiation of contracts	197	42
Project management (whole project duration up to the date of interview)	392	255
Ex-post audits	103	57
Total	**1057**	**434**

Source: Deloitte 2011

The following should be taken into account when analysing these figures:

- These figures were reported by a limited and not statistically representative number of FP7 project participants;
- The target groups (coordinator versus work-package leader) were very heterogeneous due to the nature of the consortium in different fields of science, of different consortium size, with previous FP experience (or not), organisation size and sector of activity (private versus public), the degree of centralisation of the organisation for EU projects, and the role played by the project coordinator (see Section 2.4.);
- The persons interviewed reported their time and the time spent by persons helping them, but they were not able to report the time spend on administrative obligations by central services of the organisation, their assistants, etc.;
- In addition, very few FP7 projects were terminated, so the average time for project management is only reported for the past, not for the remaining time of the contract.

However, the questionnaire was designed and has allowed looking at the following aspects:

- Coordinators spend on average 1057 hours per contract (i.e. over 6 months full-time) devoted to submit, negotiate and manage the project;
- The time spent on scientific activities was excluded from the replies, e.g. the scientific content of the proposal and the negotiation, and the time spent conducting research during the project execution;
- Work-package leaders (or equivalent) spend on average 434 hours per contracts, e.g. about 3 months full-time devoted to submit, negotiate and manage a project. The time spent on scientific activities was excluded from the replies, e.g. the scientific content of the proposal and the negotiation and the time spent conducting research during the project execution.
- Coordinators spend as much time preparing a proposal (in term of administration) as managing the project, while for work-package leaders, management is clearly the most time-consuming task.

The table below provides insight into the average time spent by participants on specific tasks within the project life cycle.

Table 3: Average time spent by participants for specific tasks within the project life cycle

Project life cycle step	SCM indicator	Time spent
Application	Average time to find a suitable call for proposal	10 hours but 1 hour (or less) for experienced participants
Application	Average time to build partnership	16 hours per partner + meetings (if relevant) except when continuation of a previous project
Application	Average time coordinators spend writing the proposal	190 hours, depending on experience and project size

Project life cycle step	SCM indicator	Time spent
Application	IT tools/ EPSS[16]	7 hours on average to "get familiar with the tool's requirements/understand what information is needed" while it takes about 2 hours to enter the information itself
Transversal	Average perceived time to grant	1 year, but up to two years in some cases, six months for the European Economic Recovery Plan
Project Management	Financial reporting	32 hours on average to "train members and employees about the information obligations" while it takes about 1 hour to enter the information itself

Source: Deloitte 2011

DG Research and Innovation has conducted an internal study on the "cost of control" which is the sum of the time (and thus related costs) spent by Commission staff throughout all project stages (including time assessing unsuccessful proposals). The table below shows the time spent for DG Research and Innovation for units involved in FP7. While FP7 represents the major part here, it should be noted that these Commission Services also manage grants contracted under previous Framework Programmes.

Table 4: Time spent by DG Research and Innovation, 2009 in Full Time Equivalent (FTE)

EC study indicator	Time spent (FTE)	%
Selection of proposals	143	10.43
Negotiation of contracts	135	9.90
Project management	404	29.52
Audit (Ex-post auditors, recovery of audit results, and additional resources)	156	11.34
Non-related activities (such as policy)	531	38.81
Grand Total	**1,369**	**100.00**

Source: European Commission, 2009

The study shows that 1369 full time equivalent worked on managing FP7 (and previous FPs) in 2009, 60 % of the time was spent on managing the project life cycle while 40% was spent on activities not related to managing FP7. Among the activities related to the project life cycle, selection of proposals, negotiation of contracts, and audits (each about 10%) represent together the same cost in term of staff time as does project management (about 30%).

The table below shows the time spent by all Research DGs (see Section 2.3.) for units involved in managing FP7 (and previous FPs). The study shows that 2,262.3 full time equivalents worked on managing FP7 in 2009. Confirming the above data, selection of

16 Electronic Proposal Submission System

proposals and negotiation of contracts represent about 20% of the cost each, while project management and audits account for about 50% and 10% respectively.

Table 5: Time spent by all Research DGs, 2009 in Full Time Equivalent (FTE)

EC study indicator	Time spent (FTE)	%
Selection of proposals	474.64	20.98
Negotiation of contracts	438.98	19.40
Project management	1,135.79	50.21
Audit (Ex-post auditors, recovery of audit results, and additional resources)	212.89	9.41
Grand Total	**2,262.30**	**100.00**

Source: European Commission, 2009

2.2.2. Effects and impacts of simplification measures

This sub-section focuses on providing an analysis of the effects and impacts of simplification measures. We quote a number of sources, including our own work.

- **EC staff**

The Interim evaluation of FP7 reported that officials responsible for different areas of FP7 attributed a score of 4 out of 4 to the quality of the systems and procedures. They also scored the clarity and transparency of the programme at 4 out of 4.

- **Stakeholders**

The Interim evaluation of FP7 reported that 55.7% of the respondents to a stakeholder consultation carried out for the evaluation consider that simplification measures have been "partially successful", 11.7% say "mostly successful" and 15.1% say they have been "unsuccessful".

- **NCPs**

NCPs' perceptions about the effects and impacts of simplification are monitored annually in the NCP survey and reported on in the annual FP7 monitoring reports, as one of the ten FP7 monitoring indicators is "simplification". This indicator is divided into three sub-indicators:

  - Do stakeholders perceive that the FP is getting simpler to use in terms of financial and administrative procedures?
  - How do stakeholders find the ease of use of the FP, compared to similar international research actions and large national schemes?

- Are there any aspects of FP procedures which are adversely affecting to a significant extent the quality of research carried out and the quality of participation in the FP?

According to the third FP7 monitoring report (covering 2009) NCPs' perception of FP7 administrative and financial procedures compared to FP6 is as follows:

- A majority of respondents consider FP7 is "easier than FP6", in particular in terms of finding information on FPs and open calls and application procedures (proposal submission) (respectively 49.8%, 53.1% and 55.9% of respondents);
- The ease of use of FP7 regarding grant negotiations, project management and communication with the Commission is rated "same as FP6" by a majority of respondents (respectively 35.5%, 42.2% and 45.0% respondents);
- A significant part of respondents (more than 15%) consider FP7 more difficult than FP6 regarding financial aspects of project management, project reporting and reviews and IT tools (respectively 23.2%, 19.4% and 16.6%).

- **Participants**

FP7 project participants interviewed for this study were quite positive about the degree of complexity of FP7. Although they all recognise that FP7 is relatively complex, they understand the reasons for the complexity of the rules, i.e.:

- the diversity of projects funded and funding schemes;
- the number of applicants and funded projects;
- the international dimension of FP7.

Our interviewees were somewhat more negative regarding the management of FP7 rules and their consequences in terms of:

- time to grant, especially for fast-moving sectors, such as IT or for the private sector;
- administrative user-friendliness: requirements vary from one project to the other (event within the same programme/call/research field) or the reporting tool is not intuitive.

When asked to identify issues both in the rules and their management, a minority of interviewees were able to provide concrete examples, but most of them were isolated problems.

These isolated cases, even if anecdotal and not representative, can have a high impact in terms of irritation. This impact is multiplied by word-of-mouth within the research community.

The table below lists a number of interviewee comments on effects and impacts of simplification.

Table 6: Participant views of effects and impacts of simplification measures introduced under FP7

FP7 simplification measures	Views of participants (coordinators/partners)
Continuity of FP6 instruments while providing more flexibility of use	Coordinators who have noticed the continuity also noticed "new naming and criteria". As a result, they see both continuity but also changes.
Improvements to the services and guidance documents for applicants	Many coordinators prepare short PowerPoint presentations to help partners, especially for financial reporting and for using the Participant Portal. A partner finds it "very good, better structure, but guidelines for applicants should be better written (description of works)". Participants still often rely on coordinators to guide them because they find current guidance targeting experienced participants, not new comers.
Introduction of two-stage procedures	Feelings about this measure are mixed: some partners say it "should be developed further" and "should be extended especially for big projects" while others say "it is ok to be rejected after the first stage, but it is frustrating to be rejected after the second stage" and "promising, but risk of rejecting good projects on the basis of a proposal on a few pages should be monitored" and "very good, even if more competition, because more chances of being successful". Coordinators say "it should be extended and a hearing should be organised systematically with evaluators" and "it makes sense, but competition is tougher". The two-stage procedure is "recommended in order to avoid wasted effort for a small company"
Introduction of a Unique Registration Facility	For Partners, the Unique Registration Facility "is a very good move" but it is sometime "difficult to find internally the registration code (PIC)". Coordinators also expressed warm appreciation for the introduction of the Unique Registration Facility
Progress towards optimised IT tools ("e-FP7" the Participants Portal)	Partners state "tools should be integrated" because the current Portal leaves the feeling of a collection of tools located at the same place but working together well, and not requesting information in the same way.
Streamlining of the project reporting requirements	About half of the partners say that 18-month reporting "is not in line with organisations' standard reporting (which is 12 months, especially for private sector organisations)" and "regular reporting is needed" as it has "added value" but for others it is "good to have 18 months reporting". Coordinators find it a "big improvement" Partners find that the reduced need for amendments is "useful" and "very good" but also "confusing". Coordinators find it "good to give more power to coordinators" especially when compared to "a bad experience during FP6". SMEs prefer 12 months reporting to "get a constant stream of funding".
Considerable reduction in ex-ante controls and revised protective measures for financially weak participants (SMEs and high-tech start-ups)	This measure concerns mainly small partners. Those concerned regard the measure very positively since it reduce the cost to participate in a FP7 project (no need to have a bank guarantee for small partners from the private sector that is usually very expansive)

FP7 simplification measures	Views of participants (coordinators/partners)
Major reduction of the number of certificates on financial statements to be provided with periodic cost claims (below EUR 375 000)	This measure mainly affects partners. They are extremely positive about this measure
Introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants	Few participants were aware of the measure. One coordinator finds it a "good idea but too complicated for big organisations, and therefore a risk. Actual costs are better and more transparent".
No need to obtain validation by the Programme Committee of those selected	NA
Revision of the Financial Regulation (to ensure broader flexibility of use of the budget dedicated to research policy)	NA
Extension of lumps sum financing for subsistence and accommodation costs	Partners find the extension of lump sums "useful", "very good because they (the Commission) could not control indirect costs in detail" and "would need to be extended" while others report that "they would not be able to participate and prefer actual costs instead". Coordinators reported that it "works well in attracting SMEs" and "makes things easier".
Simple cost reporting	The measure was appreciated where there was awareness of it, although it was seen to be "more complex than FP5" and "cost justification is still too detailed". One coordinator asked for "templates and PowerPoint guidelines". Another coordinator said that "reporting online is useful (and saves time), because partners can file the C-forms themselves (in the first year of the project, the C-forms were reported by the coordinator)".
Clearer definition of eligible costs	Clearer definition of eligible costs is "very good" although partners mentioned that "changes from FP6 are hard to understand" and even "more complex" for some. For coordinators, they are "much simpler, although there is room for improvement"
Simplified support rates per type of activity	Partners noted the simplification and one asked for a mandatory rule on financing "dissemination and management of activities" 100% (not leaving it up to the coordinator)". One coordinator did not notice the "difference" while another would appreciate having "online forms to help calculate activity costs" but had no opinion about it.

Source: Deloitte 2011

2.2.3. Measuring FP7 performance

Several measures exist or can be adapted in order to provide benchmarks or measurement of FP7 simplification.

- **"Cost of control" survey**

One of the existing sources of data is an internal study by DG RTD on the "cost of control"[17] carried out in 2009 which totals the time spent by Commission staff in the project stages (see data Section 2.2.1). Research DGs[18] (as well as the Research Executive Agency and Europe Research Council) were required to assess the volume of resources staffed for or assigned to each of the stages of the FP7 project cycle.

The limitations are that this study does not include the cost of the experts who evaluated the proposals, or the cost of external contractors conducting audits. In addition, the data do not identify the cost per thematic area of the Cooperation Programme, and do not distinguish between the management of FP6 and FP7 projects.

- **FP7 annual monitoring and interim evaluation**

The FP7 annual monitoring reports include a Time to Grant (TTG) indicator (indicator 3.3). This is defined as "the time elapsed from the deadline of the call for submission of proposals until the signature of the grant agreement"[19]. The average TTG for the whole FP7 is 350 days (median 335) for data extracted in April 2010. This figure is higher than those reported in previous Monitoring Reports (333 days in 2008, median 318 and 291 days in 2007, median 287). Although the indicator has methodological limitations[20], one explanation for such a high number is the inclusion of "several lengthier grant agreement negotiations"[21] that were not included in the previous years as the negotiations were not concluded. In addition, the experts who carried out the Interim Evaluation of FP7 found that the "TTG for projects

17 Based on the "Note for the attention of the Directors of DG RTD, REA and ERCEA: Tolerable risk of error and cost of control at DG RTD, REA, and ERCEA – data collection exercise 2009" of 10.10.2009. RTD.R5/ASB/JAL/ms D(2009) 574941.
18 DG EAC, DG ENER, DG ENTR, DG INFSO, DG RTD, DG MOVE (REA and ERCEA)
19 Third Monitoring Report, 2010
20 Time to grant (TTG) indicators are also measured in different ways by different services, judging by the self assessments, with some referring to 75% achieved, and others to 50% , see Interim Evaluation of the Seventh Framework Programme, Report of the Expert Group, Final Report 12 November 2010
21 Third Monitoring Report, 2010

funded in later calls has been falling. Consequently, it is hard to ascertain whether or not improvements are occurring"[22].

The table below provides the average TTG in days for FP7 grant agreements signed between 2007 and 2009, by thematic areas (extracted in April 2010). It shows major disparities in different areas.

Table 7: Time to Grant for FP7 grant agreements signed between 2007 and 2009

Thematic areas	Time To Grant (days)			
	Minimum	Median	Average	Maximum
Health	96	417	439	804
Food, Agriculture and Fisheries, and Biotechnology	282	450	448	650
Information and Communication Technologies	178	248	252	466
Nanosciences, Nanotechnologies, Materials and new Production Technologies	190	401	394	609
Energy	63	338	337	544
Environment (including Climate Change)	47	530	493	651
Transport (including Aeronautics)	223	541	525	926
Socio-economic sciences and Humanities	223	429	432	782
Space	94	533	478	724
Security	228	556	530	929
General activities	112	374	324	493
ERC	160	318	314	602
Marie-Curie Actions	122	322	324	650
Total (including EURATOM and CAPACITIES)	47	335	350	929

Source: European Commission, Third FP7 Monitoring Report (Monitoring Report 2009)

Several conclusions are drawn by the experts in the Interim Evaluation of FP7:

- "the procedures from negotiation to contract signature are at present very linear and sequential. The scope for having parallel procedures to quicken time to contract would be worth investigating".
- "it is hard to escape the conclusion that decisive management would sort out many of the inconsistencies."
- "The Expert Group finds it hard to explain why so many projects take so long to start, and is concerned that this reveals a lack of urgency or commitment to find solutions. Delays can even undermine the case for support: for example, research for the benefit of SMEs under the Capacities specific programme has a mean TTG of 456 days. Given that the nature of small business is inherently fast-moving, this is a disturbing statistic and also one which reinforces the complaints of small business about delays. Within Cooperation, the TTG in the (substantial) sub-themes of environment, transport and security (in order of time taken) is around double those of the sub-theme of ICT. The Expert Group

22 Interim Evaluation of the Seventh Framework Programme, 2010

has been unable to obtain convincing explanations for these disparities. Some difficult cases are inevitable, but not to this extent."

- **SCM v. KPIs**

In order to obtain funds under FP7 from the European Commission, research organisations have to allocate resources to administrative activities rather than investing them in their core activities. This might inhibit innovative research, and thus economic growth and prosperity in society. Therefore, there is a clear need to reduce the administrative burdens linked to FP7. The Standard Cost Model is one way to assess how to reduce this burden, but as indicated above, it has serious limitations for projects with a long life cycle and many participants.

Key Performance Indicators (KPIs) are suited, on the other hand, to this type of measurement, and there are existing tools which could be adapted so that more systematic use is made of KPIs in order to monitor:

- The administrative burden for FP7 participants,
- the extent to which simplification measures reduce the administrative burden for FP7 participants,
- provide insight into the flexibility and user-friendliness of FP7 tools.

As explained in Annex 2 (Evaluation and monitoring under FP7), FP7 is monitored annually based on a set of performance indicators. However, when seen in the context of the 'SMART regulation agenda' (see Annex 1), the simplification objective and related measures are only partially 'SMART' (Specific, Measurable, Achievable, Realistic and Timely).

The use of short voluntary online questionnaires attached to the tools that allow electronic submission of FP7 documents appears to be a feasible option for obtaining information from participants. The existing internal Commission study could be adapted to broaden the information obtained from Commission staff. In both cases, a balance would have to be struck between the value of the information in reducing future administrative burdens and the increase in the administrative in collecting the information.

The advantages of such an approach are:

- immediacy;
- continuity.

The table below illustrates what kind of KPIs could be used to monitor simplification within FP7.

Table 8: Monitoring of simplification: potential KPIs

KPI for EC staff	KPI for participants
Time to grant, to pay, etc. (included in annual monitoring reports)	Time spent by coordinators and project partners to manage each step of the life cycle
Time to reply	Time to reply
Time spent by EC officers (project/legal/financial) to manage each step of the project life cycle	Time to find the right information (calls, guidance documents, specific rules in these documents)

Source: Deloitte 2011

2.2.4. Conclusions

The conclusions in relation with this section are as follows:

- Time spent in FP7 activities in terms of administrative obligations (the time spent on scientific tasks is not included):
  - Overview of time spent:
    - The most time consuming project life cycle step on average for participants is project management, followed by application;
    - Coordinators state that – up until the time of the interview – they had spent almost as much time writing the application as they did managing the project[23];
    - Coordinators spend on average about 6 months of effort devoted to submit, negotiate and manage a project, project partners 3 months;
  - Administrative burden for participants depends on their previous experience with FPs:
    - From 1 to 10 hours to find a suitable call for proposal (respectively for experienced and non-experienced participants);
    - A coordinator spends 190 hours on average on writing a proposal;
    - Regarding the IT tools (EPSS and financial reporting tools) it takes on average much longer to get familiar with the tool than it does to use it in the normal course.
- Effects and impacts: there is a shared perception that FP7 simplification has brought many impact changes (including URF, IT tools), but that it is still very much work in progress:
  - Perception:

23 Most of the interviewees were still in the process of finalising their project.

        - EC officials: FP7 is efficient in terms of procedures and transparency
        - NCPs: FP7 simplification is:
            - successful in terms of finding information and applying for grants,
            - stable in terms of negotiation, project management and negotiation,
            - not successful in terms of financial reporting and user-friendliness of IT tools
        - Participants: are satisfied with some changes but still negative in terms of time to grant and administrative user-friendliness (finding information and time to reply)
- Monitoring
    - Existing monitoring is based only partially on SMART indicators. The effects and impacts of simplification are therefore difficult to measure;
    - A continuous and timely monitoring of time spent carrying out FP7-related activities before and after a simplification measure is implemented would help to draw conclusions about the effectiveness of simplification.

2.3. Key actors of FP7 simplification and their role in making it a reality

This section will present a mapping of the key actors in the simplification process and their respective role. It will also present the main barriers to simplification and the role played by these key actors to make simplification a reality.

2.3.1. Key actors of simplification in FP7

The main actors are:

- Project Applicants and Participants;
- the Commission;
- the European Parliament;
- the Council;
- the Member States.

Their respective roles in implementing simplification are described below.

- **Project applicants and participants**

Project **applicants and participants** (also sometimes called users or beneficiaries) are organisations carrying out research activities and applying for research funding. The persons involved are a diversified population of researchers, from coordinators to work package leader (or similar level of responsibility such as member of Advisory Group or Steering Committee of the project), and partners. These researchers:

  - Are from one of the 40 countries associated with the Framework Programme, and sometimes from another third country;
  - Work for a Higher Education Institution (HES), Non-Profit Research Organisation (REC), Public body (PUB), Private for Profit Organisation (PRC), or another eligible organisation. If from the private sector, they may have SME status;
  - Have or do not have experience with FP7, FP6 and previous programmes (as a coordinator or as a partner, for all responsibilities or for only one, for few or for several projects);
  - Take part in small or large projects (definitions used for this study: project size by funding from EUR 2-3 million to 8-13 million, or by number of partners from 8-12 to 15-37 partners).

Researchers and research departments are often supported by additional resources helping to manage the project:

- Their administrations / EU office in the organisation;
- Consulting companies (often associated as a partner);
- Dedicated project staff working with the researchers;
- Any hybrid of the above.

The role of the researcher in the project changes depending on the degree of centralisation:

- Centralisation at organisation level, i.e. whether (or the extent to which) the organisation centralises the scientific, administrative and legal tasks related to the project in the same departments/staff within their organisation;
- Centralisation at project level, i.e. whether (or the extent to which) the project coordinator takes care of the administrative and financial tasks of all project partners on their behalf.

Organisations that have an EU office are usually managing several EU projects or are aiming at upscaling their EU participation by providing a level of expertise able to help prepare project submissions and administer projects at the lowest possible cost. Such an organisation does not seem to be country-, or sector-dependent (public or private). Projects that provide a central administration are helping all partners in their administration, sometimes going as far as reporting the financial statements (FORM C online) on behalf of all partners in order to increase efficiency.

The table below presents eight theoretical participant organisation types[24].

Table 9: Eight theoretical types of organisation

Type of organisation	Project size	Centralised organisation (EU office), decentralised organisation (no specialisation in the organisation)	Centralised project (consulting company, staff dedicated to EU projects working with the researcher
I	Small	Centralised: researchers focus on research	Centralised: coordinators or dedicated staff manage the administration for all partners
II	Small	Decentralised: researchers do research and are responsible for the administration (financial reporting)	Decentralised: partners are responsible for reporting

24 In reality, partners are not similar within the same project, and a mix of the type of organisations is often closer to the reality

Type of organisation	Project size	Centralised organisation (EU office), decentralised organisation (no specialisation in the organisation)	Centralised project (consulting company, staff dedicated to EU projects working with the researcher
III	Small	Centralised: researchers focus on research	Decentralised: partners are responsible for reporting
IV	Small	Decentralised: researchers do research and are responsible for the administration (financial reporting)	Centralised: coordinators or dedicated staff manage the administration for all partners
V	Large	Centralised: researchers focus on research	Centralised: consulting company or dedicated staff manages the administration for all partners. Intermediary level of decision approves the project main steps but is less important
VI	Large	Decentralised: researchers do research and are responsible for the administration (financial reporting)	Decentralised: partners are responsible for reporting. Intermediary level of decision approves the project main steps: work package leader or project Advisory Group or Steering Committee
VII	Large	Centralised: researchers focus on research	Decentralised: partners are responsible for reporting. Intermediary level of decision approves the project main steps: work package leader or project Advisory Group or Steering Committee
VIII	Large	Decentralised: researchers do research and are responsible for the administration (financial reporting)	Centralised: consulting company or dedicated staff manages the administration for all partners. Intermediary level of decision approves the main steps but is less important

Source: Deloitte 2011

- **Commission**

The Commission is mainly represented by project officers in charge of managing contracts with the support of financial officers for managing the financial aspects of the project and legal officers for helping to solve legal issues that may arise. The Framework Programme is implemented annually via Work Programmes[25] that are the legal basis for future calls. Many Work Programmes are managed by bodies outside DG Research and Innovation. The table

25 http://cordis.europa.eu/fp7/wp-2011_en.html

below provides an overview[26] of the "research family". The two agencies manage projects but cannot define the annual Work Programmes.

Table 10: Organisations in charge of the Framework Programme 7

Work Programmes	Organisations in charge
Cooperation Programme (Health; Food, Agriculture and Fisheries, Biotechnology; Nanosciences, nanotechnologies, materials & new production technologies; Energy; Environment including Climate Change; Socio-economic Sciences and the Humanities), Capacities Programme (except SMEs)	DG Research and Innovation
Cooperation Programme (Information and communication technologies)	DG Information Society and Media
Cooperation Programme (Transport including aeronautics)	DG Mobility and Transport
People Programme (Marie Curie Actions)	DG Education and Culture
Cooperation Programme (space, and security)	DG Enterprise and Industry
Cooperation Programme (Energy)	DG Energy
Management of projects on behalf of the Scientific Council of the ERC for the Idea Programme[27]	ERCEA agency (European Research Council Executive Agency),
Management of projects on behalf of several DGs for the People Programme (Marie Curie Actions), Capacities Programme (only SMEs), Cooperation Programme (space and security)[28]	REA agency (Research Executive Agency)

Source: Deloitte 2011, on the basis of CORDIS website and EUROPA Portal

In addition, the Commission is assisted at national level by a network of National Contact Points (NCP). The network is "the main provider of advice and individual assistance in all Member States and Associated States". Researchers can contact their National Contact Points in the area of interest (about one contact point for each Work Programme). Although the structure of the network varies from country to country, the network aims to provide:

- Guidance for choosing thematic priorities and instruments;
- Advice on administrative procedures and contractual issues;
- Training and assistance on proposal writing; distribution of documentation (forms, guidelines, manuals etc.); and

26 See list of bodies in: MEMO/11/38, Brussels, 24th January 2011, EU research and innovation funding – immediate changes to cut red tape for researchers and SMEs, and see section on external sites at: http://ec.europa.eu/research/index.cfm?lg=en&pg=who&cat=a&tips=on
27 http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=15
28 http://ec.europa.eu/research/rea/index.cfm?pg=about

- Assistance in partner search[29].

In addition, National Contact Points provide information on their own website.

When asked about their contacts with NCPs, the majority of interviewees (participants) stated that they never contacted their NCPs, but obtained this type of information through their own network.

- **The European Parliament (EP)**

The EP follows annually how the research budget is spent. But its main role in relation to research and innovation is to vote new European legislation and the research and innovation budget is under co-decision procedure with the Council of Ministers.

- **The Council of Ministers**

The Council also votes the research and innovation European legislation and budget in co-decision with the European Parliament.

- **Member States**

Representatives of the ministries of research (or equivalent) also monitor how the research budget is spent through the different Programme Committees attached to the Work Programmes. Member States also take part in joint exchange of good policy practices in the context of the Open Method of Collaboration.

2.3.2. Role of the key actors

The actors, Applicants and Participants, Commission, European Parliament, and Council and Member States each have a role in implementing further simplification of rules and procedures:

- Applicants and Participants, especially coordinators, can play the role of interface between researchers and the Commission for the administration of the project;
- The Commission has an important role in tackling the lack of consistency in management of FP7 (interpretation, communication, performance, etc.), and the lack of timeliness in feedback (time to reply);
- The European Parliament and the Council of Ministers are responsible for the legal environment and in particular the question of control (vs. trust) (see next section) when deciding on a new programme and in particular its funding schemes, but also the revision of the Financial Regulation (and in particular but not only the Tolerable Risk of Error);

29 http://cordis.europa.eu/fp7/ncp_en.html

- The Council and Member States are engaged in a gradual process of convergence of national research systems into a European Research Area in order to avoid having 27 parallel national systems (or 40 if the countries associated with the FP are included).

Improvement to the procedures is continuous, while the development of the successor Framework Programme (Common Strategic Framework - CSF), and the revision of the Financial Regulation, and the coordination of the research efforts (the Innovative Union and the European Research Area) are dependent on EU and national approval procedures. The figure below summarises the roles of the players in achieving further simplifications.

Figure 1: The role of the key players in achieving further simplification

The areas of implementation of further simplification in which each of the key players play their role is:

- Coordinators: continuous improvements of project management rules and administration (at their organisations), as they gain experience with the Framework Programme, and procedures are put in place in many types of project organisation (see table above). They explain rules and procedures to the consortium while providing an overview of the difficulties participants face to the Commission for consideration in further simplification;
- Commission: continuous improvements and simplification of the current procedures, implementation monitoring (annual Monitoring Reports[30]);
- Parliament and Council: approval of the triennial revision of the Financial Regulation and its Implementing Rules launched by public consultation in 2009 and the Proposal

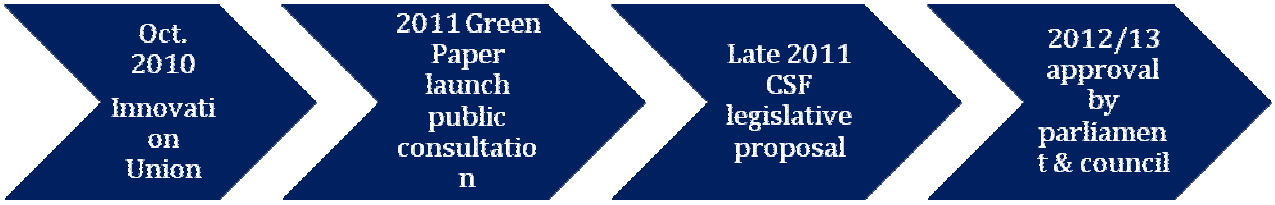
30 http://ec.europa.eu/research/evaluations/index_en.cfm?pg=monitoring

for revision presented by the Commission in May 2010[31]. The revision is due to be adopted by end of 2011, as illustrated below.

Figure 2: Towards the triennial revision of the Financial Regulation and its Implementing Rules

- The Parliament and the Council will also approve the CSF (next Framework Programme), a process which began with the Innovation Union Communication in 2010 and the Green Paper in 2011 which launched a public consultation, and will be completed in 2012/2013 with final approval.

Figure 3: Towards the CSF



- Member States "contribute to simplification, in the realm of their responsibilities, by considering adapting national rules and procedures with a view to facilitating the coordination of national and EU RTD&I funding initiatives" (Council Conclusions, 26/05/2010). The coordination of the research effort takes the form of the Innovation Union policy. The Innovation Union also pledges for the creation of a unified European Research Area by 2014 to overcome the current fragmentation of the European research systems.

31 Proposal for a Regulation of the European Parliament and of the Council on the Financial Regulation applicable to the general budget of the European Union; http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0260:FIN:EN:PDF

2.3.3. Main barriers to simplification

One of the main barriers to real change merits particular attention. It is the question of trust (vs. control) for funding research projects, which is discussed increasingly in relation to the topic of simplification. The concept is attracting a high level of attention because of the potential simplification opportunities that it may deliver. However, there is as yet no single approach to trust and different potential levels of the concept.

The table below provides an overview of the trust-based options and their main sources:

Table 11: Various insights into the trust-based approach and their sources

Sources	Various insights into the trust-based approach
COM (2010) 187[32] (see also LERU 2010[33])	"A high-trust "award" approach consisting of distributing pre-defined lump sums per project without further control by the Commission: (…) This scenario would be most appropriate in areas where the ... incentive mechanisms are strongest, i.e. in particular in the European Research Council. The advantages of the approach are obvious: no need for cost checking, minimised administrative effort, high speed. "
Third FP7 monitoring report (2010, see also EUROHORCS)	"Lack of trust" is often cited between the research project and the Commission leading to request more information than perhaps needed.
EP report on simplifying FP7 (2010)	"..the management of European research funding should be more **trust-based** and risk-tolerant towards participants at all stages of the projects..." EP is "concerned about the possible impact of **result-based** funding on the quality and nature of research, with possible constraints on scientific research and a negative impact on projects with non-measurable objectives or with an objective measurable using parameters other than that of immediate utility; is equally concerned about the potential outcome in terms of further ex-ante and ex-post evaluation of project output/results and about the pinpointing of the criteria necessary to define them..." "...recommends launching pilot tests of the 'result-based funding' with project-specific lump sums paid against agreed output/results for research and demonstration projects in specifically challenging areas; "...favours instead a **'science-based'** funding system, with emphasis on scientific/technical criteria and peer review based on excellence, relevance and impact, with simplified and efficient financial control, respecting the right of all sides to be heard"

32 Communication on Simplification, op.cit.
33 http://www.leru.org/files/publications/LERU_Advice_paper_FP8_final.pdf

Sources	Various insights into the trust-based approach
FP7 Interim Evaluation (2010)[34]	"Too high level of detail is required for audit certificates and the upshot is a 'zero-trust' policy" and "much more radical approach is now needed to attain a quantum leap in simplification. In particular, the risk-trust balance needs to be redressed, as the current risk-averse culture inhibits participation and may be undermining the research most likely to result in genuine breakthroughs" and "To increase the participation of industry and SMEs the Commission (…) has to switch from a low-risk, low-trust attitude to a more trust-based and risk-tolerant approach." "More trust should be placed in researchers to amend project work programmes and deliverables instead of sticking rigidly to plans established at the outset. In this regard, the Expert Group notes the groundswell of opinion articulated by the 'Trust Researchers'[35] campaign. At the time of writing, 13,684 researchers had signed a petition calling for a significant reduction in bureaucratic demands and for greater trust to be vested in researchers." "To give some examples (of trust): • The ESA[36] makes a distinction in risk tolerance between more applied research and basic research. Financing basic research is not current spending, but investment. The higher the risk, the higher the possible return, so that if 2% is the risk threshold, the investment is unlikely to yield very high returns. • For many purposes lump sum payments would be preferable in the interests of efficiency, even though greater financial risks might ensue. • It may be that 'one size does not fit all', for example in the context of indirect cost calculations for universities and SMEs, and that more discretion could be vested in scientific and financial officers in finding suitable compromises."
Green paper (2011) 048	"Simplifying participation by lowering administrative burdens, reducing time to grant and time to payment and achieving a better balance between cost and trust based approaches. The approach used in the CIP[37] could serve as an example"

Source: Deloitte 2011

The trust-based approach has several meanings - as the table illustrates - from the lack of trust between the research project and the Commission leading to requests for more information than perhaps needed, to achieving a better balance between cost and trust by reducing the administrative burden. But the most significant concept for simplification is the high-trust "award" approach consisting in distributing pre-defined lump sums per project without further control by the Commission. In between, there are several scenarios, such as trusting the consortium as a whole more and only controlling the coordinator.

The table below provides an overview of the main barriers to real change as seen by a number of key players and quotes in relation to those barriers.

34 Op.cit.
35 http://www.trust-researchers.eu/index.php?file=home.php
36 European Space Agency, http://www.esa.int/esaCP/index.html
37 See Fiche 4

Table 12: Possible barriers to real change

Barriers	Quotes
Variety of rules: multiple funding schemes and cost models, etc...	"The Expert Group also fears that that simplification measures implemented in the 'FP7 core' will be of limited value if additional instruments, each with their own specific rules and regulations, keep being introduced." (Interim Evaluation of the Seventh Framework Programme, 2010). "The 7th Framework-Programme contains a wide range of objectives, a multitude of intervention mechanisms with specific rules, diverse reimbursement rates and special conditions for certain types of organisation. Collectively, this diversified approach leads to a complex situation. The definition of a common set of basic principles rather than the current diversified approach, would undoubtedly lead to a considerable trimming and lightening of rules, processes and IT systems." (Assembly Of The Portuguese Republic[38]). "There is a need to establish a clearer, rationalised European R&I programme landscape." (RECH Council Conclusions 12 October 2010[39]).
Parallel national and EU systems	"Initiate a process to make the European, national, regional rules and procedures simpler and more consistent" (RECH Council Conclusions 12 October 2010[40])
Financial Regulation (Tolerable Risk of Error)	"The guiding principle in the public sector has traditionally been compliance with rules with "zero risk taking" and no explicit recognition of the level of error which controls do not correct or cannot correct in a timely fashion...In practice a certain amount of risk will be justified or "tolerable" as reducing error to "zero" is too costly or quite simply impossible. Until now, this acceptance of a justified risk of error has not been explicit. The Court applies a standard 2% materiality level for the legality and regularity of underlying transactions (a "green light"). Above this, if the error rate calculated by the Court is between 2% and 5% it gives a "yellow" assessment and if it is over 5% a "red" assessment." The Commission proposes to adopt a tolerable risk adjusted to the risk which "varies between the activities managed" through "a cost-benefit analysis" (COM (2010) 261)
Control (vs. trust) approach	See quotes the Table above

38 http://ec.europa.eu/dgs/secretariat_general/relations/relations_other/npo/docs/portugal/2010/com20100187/com20100187_assembleia_opinion_en.pdf
39 http://register.consilium.europa.eu/pdf/en/10/st14/st14980.en10.pdf
40 http://register.consilium.europa.eu/pdf/en/10/st14/st14980.en10.pdf

Barriers	Quotes
Lack of consistency in management of FP7 (Interpretation, communication, performance, etc.) and communication to applicants/ participants not adapted to new comers	Lack of "Consistent interpretation and traceable application of rules" between DGs and directorates (Leibniz Association). "It has become evident that due to the complexity of portfolio and intervention mechanisms there is a lack of coherence and consistency among DGs with regard to the interpretation and application of some rules and procedures." (ENEA) “Consistency of rules and their application throughout the different research programmes and coherence in policy implementation must ensure the right balance between project, programme and context.” “Ensuring consistency throughout the legal documentation and between EU funded programmes is not in contradiction with the need for appropriate suppleness in the implementation of these texts which is to be preserved.” “Moreover, regulatory and managerial rigidity and heterogeneity add to complexity for the beneficiaries applying for the different instruments or funding schemes and greatly increases the administrative effort and the risk of error.” (EUROHORCS 2009). There is a need for “a dedicated service or an e-mail address for Frequently Asked Questions concerning all financial/reporting issues" to uniform the interpretation of rules within the Commission. (CERN) “Communication to potential applicants is done through the Europa and Cordis portals. The Participant Portal of ‘Europa’ was created in 2009 and is integrating a series of pre-existing applications like the unique registration facility. These are valuable means of communication, but it is unclear why the two web-portals are kept separate. The CORDIS site should be improved to make it easier for first-time users, with no prior knowledge of the FP7 structure, to find what they are looking for.” (Interim Evaluation of the Seventh Framework Programme, 2010)
Lack of timeliness in feedback (time to grant and time to reply)	“The average amount of time needed from the end of a call to the signing of a research grant is nearly a year, which is high and undoubtedly offers room for improvement, but not grossly out of line with national practice. However, of more concern is diversity in time to grant (TTG) across different components of FP7. The conclusion drawn by the Expert Group is that this ought to be amenable to changes in practice in the Commission or the executive agencies, and that the areas currently exhibiting overly high TTG should be expected to converge on the best performers.” “Coherence of procedures and approaches between Commission Directorates General and the Executive Agencies responsible for administering FP7 is of crucial importance.” (Interim Evaluation of the Seventh Framework Programme, 2010)

Barriers	Quotes
Lack of interface role in project coordination	The coordinator can help to increase reach: “The complaints that the Expert Group has read and heard about the administrative burdens of involvement in FP7, despite the many worthwhile changes adopted since FP6 under the banner of simplification, testify to the continuing frustration in this regard.” “There is, however, still a wide range of evidence that small businesses are more easily deterred by ‘complexity’ in procedures and delays in contracts” “many proposals adjudged to be excellent are not funded and that this, coupled with the substantial effort needed to prepare a proposal, may deter some of the best researchers from applying.” (Interim Evaluation of the Seventh Framework Programme, 2010) “Of the more than 1500 final beneficiaries, approximately 2% account for more than 40% of the total EU funding” (2006 annual report of the Court of Auditors in Deloitte report for the European Parliament[41]). “Simplification of the research and innovation programmes is a crucial and urgent necessity to overcome the current complexity of funding which leads to excessive administrative burden and discourages potential beneficiaries in particular those with a limited administrative capacity” (COREPER report, 06.10.2010). "Probably the focus of most criticism of the Framework programme by both individual researchers and industry is the excessive bureaucracy that is counter to the culture of research and innovation" (LERU) "The very first, and crucial, step of all, however, is to regain the confidence of key FP players whose faith in the Commission as a competent administrator of EU research and innovation policy has been severely damaged by the Commission’s dysfunctional ex-post audit campaign of FP6 projects." (EARTO)

Source: Deloitte 2011

41 “Financial rules under research framework programmes”, op.cit.

The respective roles of the key players in implementing simplification and securing resulting change in relation to each of the barriers to real change (i.e. the composite picture) are presented in the table below.

Table 13: Roles of the key players in implementing (I) simplification and overcoming (O) possible barriers to real change

Barriers	Applicants and participants	Commission	EP	Council and MS
Variety of rules: multiple funding schemes and cost models, etc.		I	O	O
Parallel national and EU systems				I/O
Financial Regulation (Tolerable Risk of Error)		I	O	O
Control (vs. trust) approach		I/O	O	O
Lack of consistency in management of FP7 (Interpretation, communication, performance, etc.) and communication to applicants/ participants not adapted to new comers		I/O		
Lack of timeliness in feedback (time to grant and time to reply)		I/O		
Lack of interface role in project coordination	I/O	I/O		

Source: Deloitte 2011

2.3.4. Conclusions

Overall, the conclusions as to the role (to be) played by key actors in implementing further simplification and securing resulting change are as follows:

- Within the group of project applicants and participants, coordinators play a key role as interface between the Commission and project partners. The success rate of the project increases proportionately to the degree of involvement and dedication of the project coordinator.
- Within the Commission, project officers, as single points of contact for the project coordinators, and to some extent financial and legal officers play a key role at operational level. When asked about their contacts with project and other officers, interviewees indicated that:

    - Although there is an unwritten rule that project officers be in contact with the project coordinator only, some project partners either contact their current project officer directly, or a project officer in charge of another project (ongoing or closed).
    - Most coordinators are satisfied with the relationship they have with their project officers, but often criticise their limited availability. There is a shared feeling among project participants that projects officers are overloaded
    - Contacts with financial and legal officers are more limited than with project officers. Interviewees consider that keeping the project officer in the loop of any communication between project coordinator (or partners) and financial/legal officers is a success factor.
    - Due to the central role played by the project officer and considering the high turnover rate among project officers (who are often contract agents), interviewees perceive changes of project officers in the project life cycle (almost always once in projects covered by the interviews, sometimes twice or more) as having a negative impact on the management of the project.
- National government can play a key role through the coordination of national research systems with the European Research Area, and the alignment of national information obligations with the EU requirements;
- The Commission can continuously improve some of the current procedures without any need for political decisions;
- Other stakeholders such as national research councils should keep playing their role of facilitating participation in FP7 and communicating the needs of FP7 participants to the Commission;
- The revision of the Financial Regulation and the revision of the Financial Instrument of the Framework Programme in conjunction with CSF are both dependent on political approval by the Parliament and the Council.

Our conclusions about the main barriers and the role of key actors in overcoming them are as follows:

- The Commission can play an active role in addressing four of the seven main barriers:
    - Control (vs. trust) approach;
    - Lack of consistency in management of FP7 (Interpretation, communication, performance, etc.) and communication to applicants/ participants not adapted to new comers;
    - Lack of timeliness in feedback (time to grant and time to reply); and
    - Lack of interface role in project coordination.
- The other barriers need to be removed with the help of the participating countries and institutions involved in the decision-making process (Council and European Parliament):
    - Variety of rules: multiple funding schemes and cost models, etc..;
    - Parallel national and EU systems;
    - Financial Regulation (including Tolerable Risk of Error).

- Applicants, participants and other stakeholders need to point the Commission at possible simplification areas and openly and constructively communicate any issues, inter alia trough public consultations and debates;
- Most stakeholders agree that simplification in CSF should be based on a high-trust "award" approach consisting of distributing pre-defined lump sums per project without further control by the Commission.

2.4. Efforts already foreseen to further simplify FP7 and other simplification opportunities

The objective of this section is to:

- Provide an overview of further simplification measures;
- Assess their cost-effectiveness;
- Assess the balance between the risks and benefits linked to these measures.

Findings from previous sections will also be proposed as further ideas. The 3"I" framework designed for the Action Programme for Administrative Burden Reduction will be used to assess risks and benefits.

2.4.1. Potential to reach expected results at a reasonable cost

Further simplification measures proposed by the study are presented below, followed by simplification measures recently introduced by the Commission.

- **Simplification measures proposed by this study**

Based on findings from the previous sections, the ten simplification measures proposed by this study are likely to achieve good results. Their implementation cost is either low or medium. When low, the cost is negligible, while when medium, the measure will require some financial or human efforts.

The extent to which the further simplification measures proposed, or considered by this study, will create the desired results at reasonable cost is summarised in the table below. The possibility to implement them during FP7 is also assessed.

Table 14: Assessment of further simplification measures proposed by the study

Measures	Project life cycle phase	Expected result	Expected cost	Implementability within FP7
Tackle discrepancies of approach across Commission Directorates involved in FP7 (interpretation of rules, communication, training of EC staff, etc...)	Negotiation & Project management	Positive	Low	Neutral
Simplify the rules, rationalise and reduce the number of funding schemes and cost models, remove the obligation to open a specific	Application/ selection & Negotiation & Project	Positive	Low	Negative

Measures	Project life cycle phase	Expected result	Expected cost	Implementability within FP7
bank account for the project and implement the additional simplifications listed by the Council on 12 October	management			
Assess the feasibility of a "trust-based approach", implying strong control by the Commission at the application/selection phases and more trust during implementation and reporting (implying minimal reporting requirements)	Project management	Positive	Low	Neutral
Offer the option of a direct contractual relationship only with the major partners in the consortium (instead of collaborative agreements)	Negotiation & Project management	Positive	Low	Neutral
Develop user-friendly guidance document(s)	Transversal	Positive	Low	Neutral
Develop a single user-friendly web portal	Transversal	Positive	Low	Neutral
Align the administrative process of FP7 with typical internal business processes of the beneficiaries, where possible by linking information obligations more to the day-to-day business steps	Application/ selection & Negotiation & Project	Positive	Low	Neutral
Publish "deadline free" calls (calls that are continuously open and regularly assessed by an evaluation committee) in order to allow more flexibility for researchers	Application/ selection	Neutral	Medium	Neutral
Produce better communication about simplification	Transversal	Positive	Low	Neutral
Continuously monitor performance of FP7 and in particular the effects of simplification measures	Transversal	Neutral	Medium	Neutral

Source: Deloitte 2011

As simplification measures can sometimes create additional frustration rather than reducing irritation (see Section 2.5.), an important success factor of the abovementioned simplification measures will be the way their implementation is managed. Another point of attention will be a consistent implementation of the simplification measures across all the research Directorates and services implementing FP7 (see Section 2.2.3. on TTG).

In support of the abovementioned measures, the following simplification opportunities are feasible 'quick wins' with a potentially high (positive) impact on beneficiaries:

- Communication of the simplification measures already implemented in order to make them more visible;
- A more general FP7 communication strategy towards FP7 beneficiaries, in particular those who encounter difficulties in applying and participating: even if it is understandable that it takes them longer than experienced participants to carry out FP7-related activities, if the objective is to attract them, a specific communication strategy should target them;
- Better structuring and organisation of information about application and participation.

- **Further simplification measures introduced by the Commission in January 2011**

In response to the FP7 Interim Evaluation Report, the Commission[42] decided on 24 January 2011 to implement three measures immediately:

- Revised criteria for the acceptance of average personnel costs eligible under FP7;
- Application of flat-rate financing to SME owners and other natural persons who do not receive a salary;
- Establishment of a Research Clearing Committee to streamline the implementation of FP7, including ensuring uniform interpretation of the FP7 rules.

Of these three measures, the "average personnel cost" is a measure that is expected to lead to significant administrative simplification at a low cost. Beneficiaries of EU funds will be able to use their own accounting system to calculate personnel costs instead of setting up a parallel system to be able to calculate the actual cost for EU funding based on Commission prescriptions. The "average personnel cost" approach will make it possible to compute an average salary by category based on objective criteria (experience, seniority, level of salary, department, etc.). Then, the average salary is used to charge the number of hours worked on the project (for each category) regardless of the actual cost of the individual (which could be higher or lower)[43]. Although the cost of the measure is low, the transition period for all running contracts may be long.

The measure introducing the "flat rate for SME owners" will not bring about much simplification but is rather a new possibility for SME owners not receiving a salary to claim

42 C(2011)174 Final Commission Decision of 24 January 2011 "on three measures for simplifying the implementation of Decision No 1982/2006/EC of the European Parliament and of the Council and Council Decision No 970/2006/Euratom and amending Decisions C(2007) 1509 and C(2007) 1625". Re-formulated in the COM(2011)52 Final of 9 February 2011. "On the Response to the Report of the Expert Group on the Interim Evaluation of the Seventh Framework Programme"
43 MEMO 11/38 of 24 January 2011, and C(2011)174 Final.

costs for their own work. The measure does not require major changes, but rather resolves an issue affecting the limited number of SME owners taking part in EU projects.

The measure to introduce a "Research Clearing Committee" can potentially achieve simplification results at a low cost, but as the measure has only recently been announced, it is not possible to assess the scope of the measure, still less the decisions of the committee. However, the possibility to create consistency in the application of rules and procedures across Directorates General and Agencies has significant potential. The cost is medium because it is limited to internal coordination.

The Research Clearing Committee that plans to have four meetings per year could also play a role in monitoring the implementation of the simplification measures centrally.

The extent to which the three measures adopted by the Commission will create the desired results at reasonable cost is assessed in simplified form in the table below.

Table 15: Status of the three simplification measures proposed in 2011 by the Commission in response to the interim evaluation of FP7

Measures	Expected result	Expected cost
Average personnel costs	Positive	Low
Flat rate financing of SME owners and other natural persons not receiving salaries	Neutral	Low
Research clearing committee	Neutral	Medium

Source: Deloitte 2011

2.4.2. Risks and benefits linked to the simplification measures

The risks and benefits associated to the simplification measures are assessed in the next table.

Table 16: Risk, benefits, and balance of the simplification measures

Measures	Source	Risks (Implementability)	Benefits		Balance risk/benefit
			Impact	Image	
Average personnel costs	**2011 Decision**	+/-	**+**	**+**	Positive
Flat rate financing of SME owners and other natural persons not receiving salaries	**2011 Decision**	+/-	**+/-**	**+**	Neutral
Research clearing committee	**2011 Decision**	+/-	+/-	**+/-**	Neutral
Tackle discrepancies of approach across Commission Directorates involved in FP7	**2010 Mid-term evaluation**	+	**+**	**+**	Positive
Simplify the rules, rationalise and reduce the number of funding schemes and cost models, remove the obligation to open a specific bank account for the project and implement additional measures listed by the Council	**October 2010 Council Conclusions**	**+**	**+**	**+**	Positive
Assess the feasibility of a "trust-based approach", implying strong control by the Commission at the application/selection phases and more trust during implementation and reporting	**2010 Communication on Simplification**	**+/-**	+	**+**	Positive
Offer the option of a direct contractual relationship only with the major partners in the consortium (instead of collaborative agreements)	**Benchmarking exercise**	**+**	**+**	+	Positive
Develop user-friendly guidance document(s)	**Desk research**	**+**	**+**	+	Positive
Develop a single user-friendly web portal	**Benchmarking exercise**	**+**	**+**	+	Positive

Measures	Source	Risks (Implementability)	Benefits		Balance risk/benefit
			Impact	Image	
Align the administrative process of FP7 with typical internal business processes of the beneficiaries	**Deloitte**	**+**	**+**	+	Positive
Publish “deadline free” calls in order to allow more flexibility for researchers	**Benchmarking exercise**	**+**	**+/-**	+	Positive
Produce better communication about simplification	**Deloitte**	**+**	**+**	+	Positive
Continuously monitor performance of FP7 and in particular the effects of simplification measures	**Deloitte**	**+**	**+**	+/-	Positive

Source: Deloitte 2011

2.4.3. Conclusions

The conclusions of the section are as follows:

- Potential to reach expected results at a reasonable cost:
  - Of the three measures adopted by the Commission in January 2011, the measure on "average personnel costs" is a very important measure while the "Research Clearing Committee" has potential but cannot be assessed at this moment. The measure on eligible costs for SME owners will only affect a limited number of beneficiaries but should have a significant impact on them.
  - The ten simplification measures related to barriers to simplification are all likely to reach the expected results, at a reasonable cost.
- Risks (Implementability) and benefits (Impact and Image):
  - Most measures have a manageable or neutral risk, except the implementation of a trust based approach, which is risky in terms of continuity with previous research programmes and in terms of ensuring (the perception of) sound management of public money;
  - All measures are expected to have a benefit in terms of image and/or impact, except the Research Clearing Committee, for which the benefit is not clear (yet);
  - The five measures with the highest expected benefit (all targeting transversal issues) with limited implementation risks are:
    - Tackle discrepancies of approach across Commission Directorates involved in FP7 (interpretation of rules, communication, training of EC staff, etc…);
    - Simplify the rules, rationalise and reduce the number of funding schemes and cost models, remove the obligation to open a bank account for the project and implement the additional simplifications measures listed by the Council on 12 October 2010;
    - Assess the feasibility of a "trust-based approach", implying strong control by the Commission at the application/selection phases and more trust during implementation and reporting (implying minimal reporting requirements);
    - Offer the option of a direct contractual relationship only with the major partners in the consortium (instead of collaborative agreements);
    - Develop user-friendly guidance document(s).
  - The following were also flagged as important measures:
    - Develop a single user-friendly web portal;
    - Align the administrative process of FP7 with typical internal business processes of the beneficiaries, where possible;

- Publish “deadline free” calls (calls that are continuously open and regularly assessed by an evaluation committee) in order to allow more flexibility for researchers;
- Produce better communication about simplification;
- Continuously monitor performance of FP7 and in particular the effects of simplification measures.

2.5. Timeliness and clarity of communication about simplification measures under FP7

This section gives an overview of the perception by experts and stakeholders on the communication related to FP7 overall and simplification measures in particular.

2.5.1. Assessment of communication under FP7

There are two prerequisites communicating about the simplification measures:

- An agreed definition of what those measures are;
- A communication strategy incorporating the definition of target audiences, dissemination channels and timetable.

Neither of these minimum requirements was fully present in this case. As indicated above, the measures listed in this study are derived from the 2005 CSWD on Simplification, but they were agreed by the Commission for the purpose of this study.

Nor does there appear to really have been an information strategy as such. There is little evidence that officials made a priority of communication and/or used Info Days and similar events to explain and promote administrative simplification.

While the target group included both existing beneficiaries and newcomers, there does not appear to have been any systematic attempt to reach newcomers specifically, rather than as part of the Directorate-General's overall communication strategy. Heavy reliance was placed on word-of-mouth, and on newcomers finding the information online. A prerequisite for the latter, however, is a website which is user-friendly. This study has, therefore, necessitated looking at whether that is the case.

- **Finding information online about FP7**

The figure below presents the many different paths a newcomer to FP7 can follow to find information about FP7 (or more generally research) funding opportunities at European level, starting with three possible entry points: the institutions' Europa portal, the European Commission portal and the CORDIS research information service portal.

The green marking on the figure shows pages where users can find information about FP7 calls.

A variety of paths contributes to increasing awareness of the existence of FP7 and funding opportunities, as many visitors will obtain information about FP7 by chance. However, when it comes to finding specific information on FP7, and in particular on a call and the associated procedures, the diversity of sources of information can be confusing for applicants.

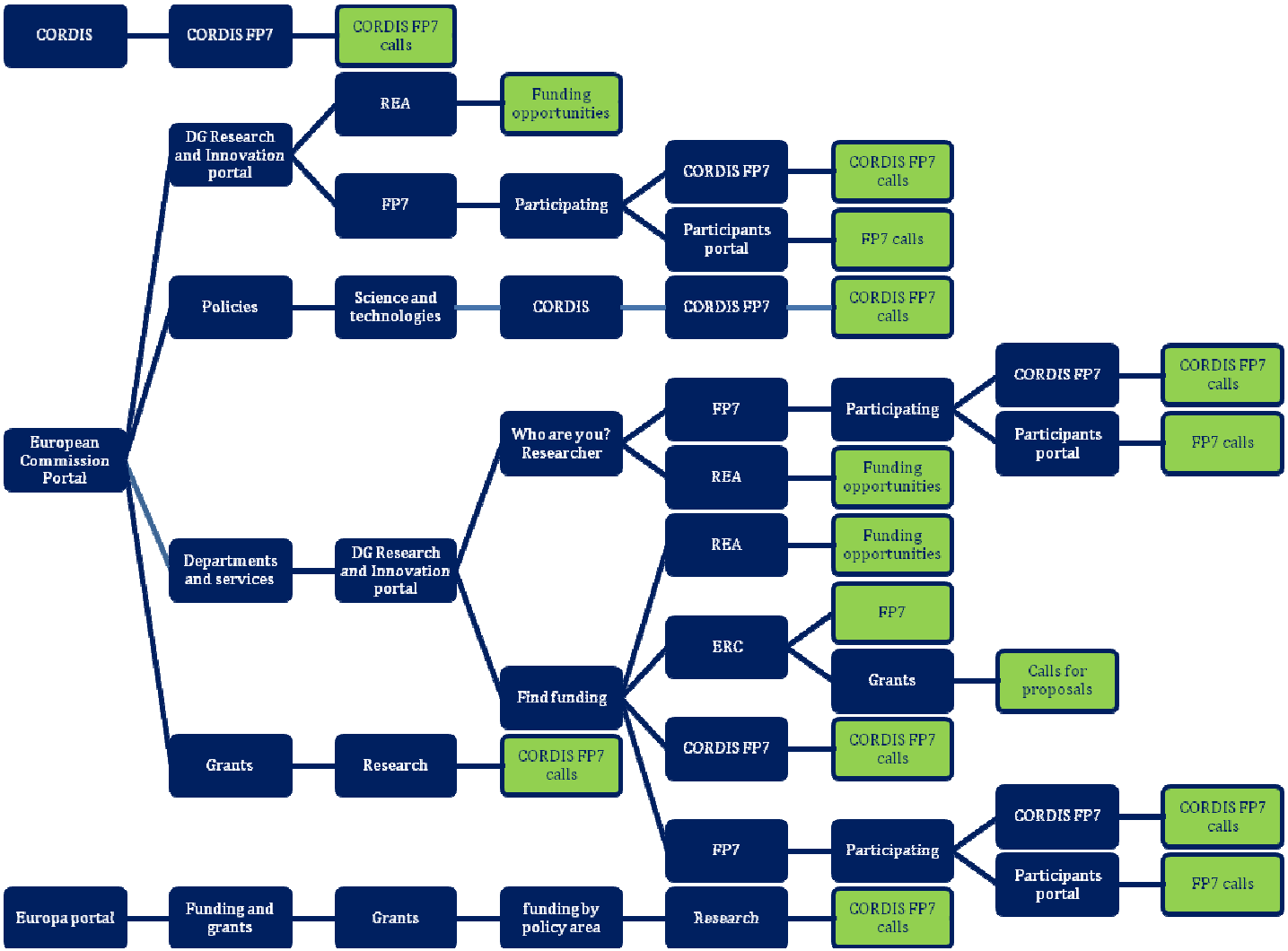


Figure 4: Paths towards finding information about FP7 calls

- **Obtaining guidance**

As stated above, the diversity of sources does not help participants to find suitable calls quickly. Most interviewees use CORDIS as the main source of information when they look for guidance online.

CORDIS provides a long[44] list of links to documents grouped by the following categories:

- FP7 legal basis
- Legal documents for implementation
- All Current Work Programmes
- Guidance documents
- Ethics Review
- Open Access Pilot in FP7
- Fuel Cells and Hydrogen Joint Undertaking (FCH JU).

Organisations such as NSF provide guidance in a single document available on the organisation's portal[45]. This 166-page document covers all the steps of the project life cycle and is the reference document for applicants, participants and NSF staff. The existence of this single point of reference, as well as its clarity and comprehensiveness, contribute to limiting differences in interpretation of rules and their application.

When asked about the added value of a single guidance document for FP7, both participants and EC staff had their doubts about the feasibility of such a document, the main reasons being the number of funding schemes multiplied by the diversity of participants profiles (and the different national contexts).

Nevertheless, the way information is presented online could be improved in many ways. Many interviewees would like to see the documents using a consistent format and structured according to project life cycle step and by profile. Financial guidelines should also be available in national languages and, ideally, ambiguities between the financial guidelines and the national specificities should be avoided.

44 The list of documents in CORDIS occupies three screens, while internationally recognised benchmarks recommend an overview on one screen only.

45 Proposal and Award Policies and Procedures Guide, January 2011 (http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/nsf11_1.pdf)

Accessibility in the national language and at national level

While many pages of the Europa portal are available in 22 languages, the FP7 web pages and the Participant Portal are available in English only. CORDIS is available in six languages (DE, EN, ES, FR, IT and PL) but most guidance documents are available only in English.

English is commonly used in science projects. The fact that information is available only in English is not problematic when the principal researcher takes care him/herself of the scientific, administrative and legal activities linked to project participation (this mainly the case for small or medium sized organisations, using a decentralised model[46]).

However, when the principal researcher works on the FP7 project with administrative and legal units within their organisation, as well as scientific assistants, they all need to be able to work in English in order to apply the rules. Interviewees often said that the need to speak English for all people involved in the project within the participating organisation was an obstacle to participation in FP7.

In addition to the sources mapped above, researchers can obtain information at national level. Most NCPs have websites in the national language (and sometimes another, often English). Some provide links to CORDIS (e.g. FNRS in Belgium); others provide an overview of calls and invite interested participants to contact their NCP. Amazingly, other NCPs do not mention FP7 or the EU on their website at all.

When asked about the contacts with NCPs, a majority of interviewees said they almost never contacted their NCPs and would rather contact their project officer (mainly for coordinators), project partners or other experienced participants in their network when they had issues with a rule.

46 See Section 2.3. respective roles of key actors.

2.5.2. Stakeholder perception of the quality, clarity and user friendliness of the information provided

- **Participants**

In the table below, a number of sample comments by participants (gathered during interviews conducted in the course of this study) are listed, linked to the four project life cycle steps listed at the left-hand side of the table.

These comments give an indication of the main problems participants encounter in finding information on FP7, and therefore by extension on simplification measures, for each step of the project life cycle.

Table 17: Comments from participants on the main problems with the four project steps of FP7

Project life cycle steps	Comments from participants (coordinators/partners)
Application/ selection of proposal	Participants often rely on their network to inform them about the calls and on coordinators to design the application because they think it is quicker and easier for them than using the FP7 information channel.
Negotiation of contracts	Consortium agreement: the Commission did not provide a model when FP7 started. Initiatives such as the Development of a Simplified Consortium Agreement for FP7 (DESCA) initiated by ANRT (www.anrt.asso.fr), the German CA-Team (represented by Helmholtz - www.helmholtz.de and KoWi - www.kowi.de), EARTO (www.earto.eu), Eurochambres (www.eurochambres.be), and UNITE (www.unite.be) are filling the gap http://www.desca-fp7.eu/
Project management	As information provided by FP7 channels is not straightforward, participants need help to manage contracts by unloading a share of the workload to: dedicated EU staff, consulting companies, and specialised software. This allows them to concentrate on research. Partners are "not educated" to cope with complex rules and procedures.
Ex-post audits	Participants receive conflicting information for an audit between the official letter from the Commission providing a list of items to prepare and the letter from the local audit firm selected by the Commission that will conduct the audit.

Source: Deloitte 2011

Interviewees also reported that "most of the simplification measures and as a consequence information related to these, are for coordinators" or people working "fulltime on FP7". They report "no real changes" or "nothing that really stands out". Many coordinators report that they "get used to the procedures". Once you are "used to the system (familiar with the rules), it works well".

The role of the coordinator (and the coordinator's team) is often highlighted. For example, an FP7 partner reported that "management is very much in the hands of the consortium, it is

much smoother (excellent and experienced coordinator of about 20 projects)" and another reported "the coordinator provides predefined inputs, he is well educated as a coordinator, and he is diplomatic, and formulates things to get through".

Other FP7 features contributed to communicate about simplification measures:

- "Participation of the project officer in annual meetings is important", their participation "could replace some project reporting" and "the project would be better understood".
- "The new IT system makes applications much smoother than before, the technical annex can be re-used, etc."
- EU Info Days for coordinators and national Info Days are "helpful because they help to meet other organisations (new and known) and meet the Commission", they provide an "overview of the main calls, and lots of tips on how to apply" and "help to find everything at once and get information in advance"

The table below provides an overview of the **availability**, **timeliness** and **perceived quality** of the information linked to simplification measures introduced under FP7. The assessment of quality reflects the main thrust of feedback collected from FP7 participants during the interviews.

Table 18: Overview of the availability, timeliness, quality and structure of the information linked to simplification measures introduced under FP7

Information about simplification measures	Availability	Timeliness	Quality
Continuity of FP6 instrument while providing more flexibility of use	Yes	2007	No improvement
Improvements to the services and guidance documents for applicants	Yes	Came during 2007, often late	Improvement *except terminology, acronyms and length*
Introduction of two-stage procedures	For some calls	2007	Divergent opinions
Introduction of a unique registration facility (URF)	Yes	Setup during 2007 during open calls	Improving
Progress towards optimised IT tools ("e-FP7" the Participant Portal)	Depending on the calls/ projects	2007-2011	Neutral opinion
Streamlining of the project reporting requirements	Depending on the projects	2007	Improving but annual reporting is still necessary for the consortium
Considerable reduction in ex-ante controls and revised protective measures for financially weak participants (SMEs and high-tech start-ups)	Yes	2007	Improving
Major reduction in the number of certificates on financial statements to be provided with periodic cost claims	Yes	2007	Improving

Information about simplification measures	Availability	Timeliness	Quality
(below EUR 375 000)			
Introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants	Currently under restrictive conditions	Not implemented	Not applicable
No need to obtain validation by the Programme Committee of those selected	No	Not implemented	Not applicable
Revision of the Financial Regulation (to ensure broader flexibility of use of the budget dedicated to research policy)	No	Depending on the approval by both Parliament and Council	Not applicable
Extension of lump sum financing for subsistence and accommodation costs	Depending on the projects	2010	No opinion
Simple cost reporting	Yes	2007	Improving for coordinators, no opinion for others
Clearer definition of eligible costs	Yes	2007	Improving for coordinators, no opinion for others
Simplified support rates per type of activity	Yes	2007	Improving for coordinators, no opinion for others

Source: Deloitte 2011

2.5.3. Conclusions

Our conclusions based on interviewees' perception of the availability of information, transparency and speed related to the implementation of simplification measures are as follows:

- Compared to other international practices, the number of clicks needed for an applicant to find information about funding sources and / or a call for proposal is too high (more than 3 clicks);
- The diversity of online sources for information about FP7 calls creates unnecessary confusion for applicants and participants;
- Considering the number of schemes and the diversity of rules a single guidance document covering all FP7 schemes seems very difficult to implement (while desirable);
- In terms of the organisation of information, the following are barriers to obtaining information on simplification measures:
    - The complex information structure and mapping of information sources for applicants/participants;

    - The failure to present and structure information in a user-friendly manner, e.g. by project life cycle phase and step, profile, etc.
    - The mass of information that is available (to which the simplification measures appear merely to be adding!).
- In terms of the support tools, the functionalities and performance of the Participant Portal are still work in progress (since 2007) and the Portal is not (yet) self explanatory (guidance is still needed for first-time users);
- NCPs are not seen as a key interface between researchers in their country and the European Commission;
- The majority of operational guidance documents are available in English only, which requires English language skills for staff involved in the project, including administrative and financial staff. This can represent a barrier to participation;
- There is a perception that FP7 is better adapted to experienced participants with a good command of English, de facto discouraging participation by specific categories of applicants (centralised organisations, SMEs, newcomers to the programme, etc.);
- The need for targeted communication about simplification is needed for both experienced participants (to highlight the changes) and newcomers (to attract new participants);
- Many simplification measures were implemented after FP7 had already started, which means that they were not fully included in the communication about the programme when it was launched and remained unnoticed by participants;
- As many measures are still work in progress, many applicants still do not understand the added value of some of the new features:
    - There is still room for (mis-)interpretation, in particular in relation to the eligibility of costs;
    - The (changing) terminology and manifold acronyms contribute to the administrative burden for users.
- More generally, there is a need for a communication strategy dedicated to simplification measures.

2.6. Ideas from other large research programmes: could different approaches deliver better results?

This section focuses on programmes managed by the three following research organisations:

- National Science Foundation (hereafter NSF), United States;
- German Research Foundation (Deutsche Forschungsgemeinschaft, hereafter DFG), Germany;
- National Research Agency (Agence Nationale de la Recherche, hereafter ANR), France.

In order to ensure a broader picture, the benchmarking exercise was further extended to other sources and organisations, in particular in relation to a Commission survey on result-based funding and simplification practices in research organisations worldwide. Following the publication of the Green Paper "From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding"[47] on 9 February 2011 (which was also included in the desk research), it was also decided to include the Competitiveness and Innovation Framework Programme (CIP) ICT/FET (Future and Emerging Technologies) in the benchmark.

Furthermore, FP7 participants interviewed for this study were also asked to identify good practices in other programmes and organisations and to what extent they would be applicable to FP7.

The perceptions of NCPs whose views were sought as part of the FP7 monitoring reports have also been taken into account. Data was also collected on the relevance of the negotiation stage in the project life cycle and the role of control in the project life cycle.

The key judgement criterion in considering the benchmark programmes and good practice was the comparison of the project life cycle of FP7 with benchmark programmes.

Findings from desk research and interviews are presented below per organisation, starting with the three research organisations selected, and continuing with the good practice examples which were collected using the additional data sources mentioned above.

47 Green paper "From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding", COM(2011) 48 of 9 February 2011

Benchmarking exercise

The data collected during the benchmarking exercise (desk research and interviews with representatives of the three selected research organisation) is summarised in the table below and discussed in detail in this section.

- **Overview ANR, NSF and DFG**

Table 19: Benchmarking organisations overview

	FP7 (EC)	NSF	DFG	ANR
Profile (2009 figures)				
Annual budget	€ 7.2 billion (€ 10bn in 2013)	€ 5.2 billion[48]	€ 2 billion	€ 0.8 billion
Number of proposals submitted annually	13,654	42,000	Not communicated	6,036
Number of grants awarded annually	3,286	10,000	Not communicated	1,334
Number of participants	15,291	About 10,000	Not communicated	5,200
Beneficiaries	Private companies, public organisations, individual researchers, as well as researchers and organisations outside the EU (Candidate Countries, Associated States, developing countries, emerging economies or	Individual or small groups of investigators, research centres and universities, instruments and facilities	Individual or small groups of investigators, research centres and universities, and facilities	Private companies, public research organisations and universities, individual researchers, and facilities

48Approx. $ 6.9 billion (exchange rate 6 December 2010)

	FP7 (EC)	NSF	DFG	ANR
	industrialised nations)			
Success rate (%)	22%	20% (untargeted calls)	50-55%	23%
Average grant duration	To be confirmed	3 years	Not communicated	3 years
Time to grant	11.5 months[49]	NC	6.0 to 6.2 months	6.0 to 8.0 months
Staff	2,500	2,100	Not communicated	240 at June 2011
Funding opportunities				
Funding schemes	Collaborative projects, networks of excellence, coordination and support actions, support for frontier research (ERC), support for training and careers development of researchers (PEOPLE), research for the benefit of specific groups (in particular SMEs)	Individual and small group of investigator grants. Grants to research centres and facilities	Individual Grants Programme, Coordinated Programmes, Excellence Initiative, Research Infrastructure, Scientific Prizes and International Cooperation	Collaborative projects ("Programmes blancs" and the 7 thematic area programmes) and support for young researchers, chairs of excellence, and post doctoral returns
Type of research	Applied research (Cooperation Programme)	Mainly focused on basic research	More focused on basic research[50]	More focused on basic research, 50% is non-thematic research
Disciplines	Pluri-thematic (Health Food, Agriculture and Fisheries, Biotechnology Information & communication technologies	Pluri-thematic (Biological Sciences, Computer and Information Science and Engineering, Engineering, Geosciences, Mathematics and Physical Sciences,	Pluri-thematic (not specified)	Pluri-thematic (not specified)

49 350 days average taking into account all FP7 projects since FP7 was launched (source: Third FP7 Monitoring Report)
50 See DFG "priority programmes" on
http://www.dfg.de/en/research_funding/programmes/coordinated_programmes/priority_programmes/index.html

	FP7 (EC)	NSF	DFG	ANR
	Nanosciences, nanotechnologies, materials & new production technologies Energy Environment (including Climate Change) Transport (including aeronautics) Socio-economic Sciences and the Humanities Space Security)	Social, Behavioural and Economic Sciences, and Education and Human Resources)		

Selection process[51]				
Description	"Excellence, Transparency, Fairness and impartiality, Confidentiality, Efficiency and speed, Ethical and security considerations": • **Eligibility** check; • **Peer individual evaluation**; • **Peer panel review**; • **Commission ranking**.	Proposal review and processing within the "Merit Review": "fair, competitive, transparent, and in-depth" selection: • **Peer review:** Intellectual Merit and Broader Impacts; • **Program Officer** recommendation; • **Division Director** review; • Recommendation sent to the **Division of Grants and Agreements**	"Quality-based differentiation": • **Expert review**: evaluation by voluntary reviewers against scientific criteria; • **Review Board** on the basis of the expert review; • Final decision taken by the **Grants Committee**.	"Transparency, equity and quality", ISO 9001 certified: • Two written reviews by **external expert reviewers**; • Assessment by a **specific panel of researchers** and recommendations to the programme's Steering Committee**;** • **Programme's Steering Committee** proposes a final list of recommended applications; • **ANR decision**

51 Based on self-description of the selection process on the organisations' websites

Programme management				
Project life cycle (see Table 20)	Proposal, Negotiation of contracts, Project management, ex-post audits	Merit review (including "Business Review"), Grant administration	Proposal, Project management	Programme planning, selection, follow-up and assessment
Control stress point	Financial reporting	Proposal selection	Proposal selection	Proposal selection
IT tools	URF, EPSS, NEF, FORCE and SESAME grouped under the Participant Portal (PADME)	FastLane[52]	elan - Electronic Proposal Processing System[53]	"Site de l'ANR de soumission e projets en ligne"[54]
Guidance documents	Multiple documents[55], multiple locations	Single document: Proposal and Award Policies and Procedures Guide (PAPP), single location	Multiple documents (linked to call), single location	Document provided for the call, differs according to the call to avoid long document
Performance measurement	Annual indicator-based assessment of programme implementation, interim (completed) and ex-post (planned) evaluations	Annual performance measurement	Annual performance measurement (annual report), statistics and funding programmes evaluation	Innovative policy to promote quality - certified ISO (annually monitored). International panels to evaluate programmes (2008, 2010)
User-friendliness	Part of the performance measurement	Part of the performance measurement	Part of the performance measurement	Part of the annual quality monitoring process
Simplification exercise	Ongoing	Part of performance measurement	Quality review (Quality Assurance and Programme Development team)	Yes, continuous through the annual review for keeping the ISO certification (see examples in the text)

52 https://www.fastlane.nsf.gov/index.jsp
53 https://elan.dfg.de/dana-na/auth/url_2/welcome.cgi
54 https://aap.agencerecherche.fr/
55 For an overview: http://cordis.europa.eu/fp7/find-doc_en.html

Source: Deloitte 2011, based on FP7 Third monitoring report, DFG, ANR and NSF websites, interviews with DFG, ANR and NSF staff

- **Project life cycles**

The table below presents the life cycle of NSF, DFG and ANR funding programmes.

Table 20: NSF, DFG and ANR funding programme life cycle

Project life cycle phase	NSF	DFG	ANR
Selection of proposals Merit review: submission, review and award	Merit review: • Proposal Preparation and Submission • Proposal Review and Processing • Award Processing	• Publication of a funding opportunity • Submission of proposals • Proposal evaluation (3 independent reviewers) • Programme officer review • Award (or decline) decision by Division Director • Award processing by DFG's Division of Grants and Agreements (DGA)	Programme planning and selection: • Programme planning (only for thematic programmes) • Submission of proposals • 2 stages proposal evaluation spanning over 3 months • Negotiation • Signature of contract with all partners
Negotiation of contracts	Not applicable	Not applicable	Included in the selection
Project Management (Issuance, administration and closeout)	• Annual reports (technical and financial) • Final report	• Annual reports (technical and financial) • Final report	Follow-up and assessment: • 6 monthly reporting (technical and financial) • Mid-term reporting • Final reporting
Ex-post	Ad hoc audit by Office of Inspector General (OIG)	Economics and auditing office	Ad hoc audit for about 5% of projects

Source: Deloitte 2011, based on FP7 Third monitoring report, DFG, ANR and NSF websites, interviews with DFG, ANR and NSF staff

- **Commission survey on result-based funding and simplification practices in research organisations worldwide**

The Commission conducted a survey[56] on research funding organisations, investigating a "result-based approach using lump sums" and "good practices on simplification" during 2010.

This survey identified the following "self-reported" good practice examples:

  - the Danish Agency for Science Technology and Innovation[57], chosen for its faster approval system: the e-application system in Denmark[58] is a new system designed to simplify and help participants but also peer reviewers and project officers;
  - the National Institute for Health (NIH)[59] in the United States, for its fast review of applications; and
  - the Technology Strategy Board (TSB)[60] in the United Kingdom for streamlined reporting requirements (1-page quarterly report every 3 months).

- **Trust-based approach currently run by the FP7 ERC and JTIs (IMI, Artemis, Clean Sky, ENIAC, FCH, GMES)**

Both the ERC and the Joint Technology Initiatives (JTIs) are new instruments under FP7. They entrust the principal investigator (ERC) and the dedicated structures implementing the JTIs with the management of funds.

- **CIP Eco-innovation market replication project and FP7 ICT future and emerging technologies (FET): Good practice examples for other research and innovation funding programmes**

The Green Paper[61] "From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding", published on 9 February 2011, proposed the CIP Eco-innovation[62] First Application and Market Replication Projects, and the FP7 ICT FET[63] as examples of "open, light and fast implementation schemes" for other research and innovation funding programmes to "allow flexible exploration and

56 ERAC Committee, Programme Committee for the Cooperation Programme, and EC scientific counsellors in third countries
57 http://en.fi.dk/
58 http://en.fi.dk/funding/e-application
59 http://www.nih.gov/
60 http://www.innovateuk.org/
61 COM (2011) 48. 09.02.2011. http://ec.europa.eu/research/csfri/pdf/com_2011_0048_csf_green_paper_en.pdf
62 http://ec.europa.eu/environment/eco-innovation/application_en.htm
63 http://cordis.europa.eu/fp7/ict/programme/fet_en.html

commercialisation of novel ideas", in particular by SMEs. This statement is based on findings from the CIP interim evaluation[64].

Both schemes are creative. The CIP/ Eco-innovation scheme provides funds in the form of grants to SMEs (which are faster than collaborative projects). The ICT/FET scheme is "topic-agnostic" and "deadline-free". The scheme also uses Specific Targeted Research Projects (STREP) and Community Support Action (CSA) funds instead of the collaborative projects approach (which is also faster).

2.6.2. Perception of FP7 in the international research landscape

- **Perception by National Contact Points (NCPs)**

The FP7 monitoring system uses ten "indicators" and 35 "sub-indicators"[65]. The tenth indicator, "simplification", includes three sub-indicators, of which one is "How do stakeholders find the ease of use of the FP, compared to similar international research actions and large national schemes?"

The question: "*based on your own observations and the feedback received from researchers and stakeholders in your country, how would you rate the ease of the use of FP7 [in 2008, 2009] compared with similar international research actions or large national schemes?"* was covered by the second and third monitoring report. The source of information was the respective annual survey of National Contact Points (NCPs). Data reported in these monitoring reports is presented in the table and figure below:

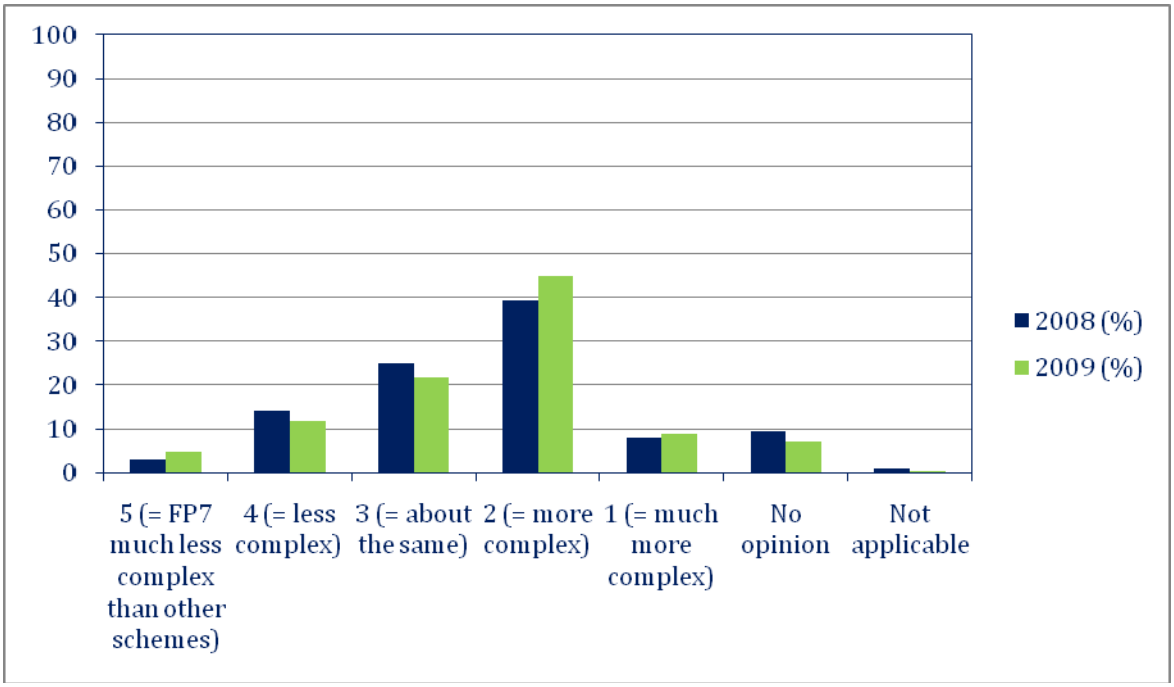
64 GHK and Technopolis, 9.03.2010. Interim Evaluation of the Competitiveness and Innovation Framework Programme (2007 – 2013). http://ec.europa.eu/cip/files/docs/interim_evaluation_report_march2010_en.pdf
65 Source: FP7 monitoring reports

Table 21: NCPs' perception of FP7 compared with other funding schemes

Comparison of ease of use of FP7 with other funding schemes	2008		2009	
	Number of respondents	% of total respondents (%)	Number of respondents	% of total respondents (%)
5 (= FP7 much less complex than other schemes)	9	3.11	10	4.74
4 (= less complex)	41	14.19	25	11.85
3 (= about the same)	72	24.91	46	21.80
2 (= more complex)	114	39.45	95	45.02
1 (= much more complex)	23	7.96	19	9.00
No opinion	27	9.34	15	7.11
Not applicable	3	1.04	1	0.47
Total	289	100.00	211	100.00

Source: Second & Third FP7 Monitoring Reports

Figure 5: NCPs perception of FP7 compared with other funding schemes



The graph shows that in 2008, 47,5% of NCPs considered that FP7 is more or much more complex than other funding schemes. One year later, 54% of the NCPs surveyed considered FP7 more or much more complex than other funding schemes.

- **FP7 participants**

FP7 project participants interviewed for this project were less negative than NCPs about the complexity of FP7. Although they all recognise the fact that FP7 is relatively complex, they seem to understand the reasons for this complexity.

When asked to name a national or international research funding programme which could inspire FP7 by its exemplary procedures, only a very small number of interviewees came up with good practice examples. The programmes most often mentioned are listed in the table below.

Table 22: Good practices by country from other programmes as reported by FP7 participants

Programme	Country	Good practice
SNSERC and CRSNG	Canada	Finances only individual managers http://www.nserc-crsng.gc.ca/onlineservices-servicesenligne/index_eng.asp
Agency for Science, Technology and Innovation	Denmark	Approval system is faster The agency administers research and funding to promote innovation for the Danish Council for Independent Research, the Danish Council for Strategic Research, the Danish Council for Technology and Innovation and the Danish Research Training Committee under the auspices of the Danish Research Coordination Committee http://en.fi.dk/
ANR	France	'Programme blanc'(topic-agnostic) devoted to SMEs http://www.agence-nationale-recherche.fr/
FP ICT policy support programme (PSP)	EU	The financial calculation is easy to understand with 50% participation reimbursed plus a unique overhead of 30%. http://ec.europa.eu/information_society/activities/ict_psp/index_en.htm
Swedish Research Council & VINNOVA	Sweden	Swedish funding system is much less detailed for each step of a project life cycle (trust principle) http://www.formas.se/default 529.aspx http://www.vinnova.se/en/
Technology Strategy Board (TSB)	UK	Streamlined and easier reporting with one page report every 3 months http://www.innovateuk.org/ Call procedure
EPSCRC[66]	UK	More difficult to get funding, but trust principle, time spent on research rather than bureaucracy http://www.epsrc.ac.uk/Pages/default.aspx
NIH Brookes Anthony J.	USA	The review of applications is far better than anything else in the world http://www.nih.gov/
NIH	USA	The reporting is more flexible for the scientific section. But it is different because few partners are involved http://www.nih.gov/

66 Engineering and Physical Science Research Council

Programme	Country	Good practice
NIH centers for AIDS research (CFAR)	USA	Equivalent to the EU networks of excellence. Allows re-applying for funding to continue the project. Provides administrative and shared research support to synergistically enhance and coordinate high quality AIDS research projects. http://www.niaid.nih.gov/labsandresources/resources/cfar/Pages/default.aspx
Department of Energy (DOE):	USA	Interesting in terms of selection where the criteria are: quality of project and methodology, while in Europe there is more paperwork, and more emphasis on the quality of the proposal

Source: Deloitte 2011

However, the majority of FP7 participants do not see these being good practices as applicable to FP7, because its complexity and international reach make these examples difficult to transfer to the EU context.

2.6.3. Simplification opportunities from other research programmes

Simplification opportunities from other research programmes are presented below.

- **Pertinence of the negotiation phase**

One of the main differences between the FP7 project life cycle and the three benchmarked organisations[67] is the negotiation phase.

In FP7, the negotiation phase aims to[68]:

- Agree on the scientific-technical details of the project;
- Collect financial and legal information needed for:
  - Preparing a Grant Agreement;
  - Project management;
  - Reporting on the project execution;
  - Checking the financial viability/capacity of the coordinator;
  - Checking subcontracting and third party participation.
- Follow-up on the ethics review (if relevant).

Depending on the size and nature of the project, the Project Officer in charge of the project negotiations may organise meeting(s) between the Consortium (coordinator, assisted by project partners if necessary) and the Commission/REA.

67 Also ERC
68 Negotiation Guidance Notes, Version 10 September 2010

Experienced FP participants are familiar with the negotiation phase and its contents. However, when interviewed, less experienced participants often claimed that the terminology used was misleading. The most striking fact for them was that almost all projects invited to the negotiation phase signed a Grant Agreement, while they expected the negotiation phase to reduce the number of successful applications. The second misunderstanding about the negotiation phase was that participants expected more discussion about the scientific aspects of the projects. Their perception of the negotiation phase was that the objective was really for the Commission to communicate to the project coordinators the conditions applying to their project:

- Administrative conditions, e.g. coordinators are asked to produce additional administrative documents or to clarify the administrative status of a partner;
- Financial conditions, e.g. the proposal is accepted, but with a reduced budget/EU contributions, or there are mistakes in the financial section. In the latter case, these mistakes need to be corrected and clarified in order to avoid consequences in financial reporting;
- Scientific conditions, e.g. the proposal was accepted, but with comments about the scientific scope or methodologies.

All participants agreed that the discussion that happens in the negotiation phase should be maintained and take place at some stage of the project life cycle. They perceive the negotiation phase as positive in as much as it provides an opportunity for project coordinators and the Commission/REA (project, legal and financial officers) to discuss and clarify important project points. Moreover, the main outcome of the negotiation phase is that the details of the grant agreements are finalised with the applicants and that all the necessary checks are carried out. That is why the negotiations take place before the grant agreement is signed, thus before the project starts.

The same type of discussion takes place in programmes managed by NSF, ANR and DGF, but not within the framework of a so-called "negotiation" phase. The discussion occurs at the end of the proposal submission phase (e.g. "Business Review" within the Award Processing phase at NSF) or at the beginning of the project management phase.

FP7 participants interviewed suggested that the EU negotiation phase could be improved by:

- a faster process for those with no scientific/financial negotiation, but only administrative checking and the signature of the grant agreement to prepare and sign (distinction between groups of proposals within the same call);
- moving from the sequential logic (with strict deadlines followed often by long periods of silence) to starting all procedures simultaneously for the consortium and the Commission, and not waiting in order to avoid wasted work (check on a partner that left, etc.);
- more generalised use of online tools (Negotiation Facility Tool on the Participant Portal, emails, etc);
- use of video conferences where possible, in lieu of meetings;

- clear contact points for the negotiation: project coordinator and project officer.

Although the benefits of changing the name and the positioning of the negotiation phase (clarity in terms of objectives and expected outcomes of the negotiation) are limited in the short term due to the difficulty of changing FP7, a major simplification step in future FPs would be to align the high level project life cycle with the project life cycle of the three benchmarked organisations: application/selection step, project management and ex-post.

Even if merely shifting the discussion that currently takes place in the negotiation phase to another phase would not reduce the administrative burden as such, it would reduce the 'perceived' burden by participants.

- **Project life cycle: Control**

Apart from the positioning of the "negotiation phase", the organisations we benchmarked with FP7 are often organised in line with the same high level project life cycle as FP7.

However, they do not have the same approach to control. The NSF, ANR and DFG, but also ERC, have a different trust/control balance.

All programmes considered in the benchmarking exercise are funding programmes using public money. The organisations managing these programmes are accountable to their taxpayers and need to ensure a minimum of control over public spending.

In programmes managed by NSF, ANR and DFG, the highest degree of control is in the application/selection phase. These organisations then consider that the researchers benefiting from the grants are responsible for and empowered to deliver the execution of the research project. The respective programme officers support the beneficiaries and deal with the grant administration.

This approach does not mean that NSF, ANR and DFG do not control the spending of the grant once it is awarded. Beneficiaries have to report on outcomes of the research projects and spending. However, the reporting requirements are much lighter than in FP7.

The outcome of the control operated by ANR, DFG and NSF is to detect errors and to avoid them in the future. Moreover, projects are not always audited – unlike in FP7.

None of the organisations benchmarked has carried out a formal simplification exercise. However, they all have strong quality policies and performance improvement processes.

- **Minimal reporting requirements**

Some of the organisations benchmarked are often cited as showing more trust in the participants during the project management life cycle. This is the case for:

- the TSB in the UK, with 1 page reporting every 3 months;
- ERC/ JTI, which only require reports to the principal investigator and the dedicated structure;
- NIH in the US, with flexible reporting;
- EPSCR in UK which, after a difficult selection process, largely trust the researcher during execution of the project to implement what has been approved.

- **Call expectation and "deadline free" calls**

Some programmes help researchers to prepare future funding projects by providing them with the forward planning for expected calls, or by using the same schedule of calls every year. Other programmes are continuously open:

- ANR publishes a calendar of expected calls on its website;
- ICT/FET is "deadline free".

- **Communication with applicants and participants**

NSF demonstrates good practice both in terms of guidance provided to participants and interactivity of the IT support tools.

The Proposal and Award Policies and Procedures Guide (PAPP) and *fastlane* tool make it possible for participants and applicants to find and submit application and project management related information in a user-friendly manner.

2.6.4. Conclusions

The conclusions are:

- Although FP7 has no comparators, it is possible to adopt good practices from other large research programmes.
- Recently launched EU research programmes such as the ERC and JTIs are using a simpler approach. There is an opportunity to reduce administrative fragmentation for EU researchers applying for and delivering research projects.
- Most programmes assessed allocate grants to a specific researcher instead of under cooperative agreements, and therefore have leaner operations (including better guidance), and a different balance between trust and control.
- Good practice examples collected that are applicable to FP7 include:
  - Quality certification engaging the operator in a continuous improvement process;

- Offer the option of a direct contractual relationship only with the major partners in the consortium (instead of collaborative agreements);
- Trust based approaches, with strong control at the application/selection phases and trust during implementation and reporting (implying minimal reporting requirements);
- Incorporation of the equivalent of the negotiation phase either as the closure of the selection step or at the start of the project-management step instead);
- Assess the feasibility of a single guidance document;
- Integrated interface portal;
- Forward communication planning of a calendar of expected calls or a standard annual schedule of calls, and “deadline free” calls;
- Aligning the FP7 high level project life cycle with the benchmarked organisation.

3. CONCLUSIONS AND OUTLOOK

While stakeholders understand that a programme such as FP7 is complex *per se,* and that the measures introduced to date are not a panacea, they still see significant room for improvement. Simplification remains a key challenge in their minds.

Of the 15 simplification measures introduced since FP7 was proposed in 2005, eight affect the project life cycle transversally, while seven affect one specific project life cycle step (either application/selection, negotiation, audit or project management).

Of these 15 measures, the most successful have been, according to participants and stakeholders:

- the introduction of a unique registration facility (URF);
- a major reduction in the number of certificates related to financial statements that must be provided with periodic claims;
- a considerable reduction in ex-ante controls and revised protective measures for financially weaker participants; and
- the extension of lump sum financing for subsistence and accommodation costs.

These measures should naturally be kept in place, and strengthened in the future where appropriate.

However, other measures (that were considered as potentially important by stakeholders) are not perceived as having been successfully implemented:

- the introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants (very few certifications were delivered);
- a clearer definition of eligible costs, and improvements to the services and guidance documents for applicants (the definition of eligible costs remains unclear, and the many documents available remain difficult for newcomers to understand);
- a simpler cost reporting system (reporting remains complex); and
- a simplified support rate per type of activity (participants may face several support rates depending on the type of funding scheme that applies to them).

Given the potential impact of these measures if implemented effectively, the Commission should continue to focus on improvements in these areas.

Following the study results, the most time-consuming project life cycle step for participants is project management, followed by application/selection, negotiation and audit in terms of administrative obligations (the time spent on scientific tasks is not included). Project coordinators spend almost as much time writing the application as they do managing the project[69]. Simplification efforts will obviously have most effect if they are targeted on these most time-consuming steps.

It is not surprising that participants with prior experience of the Framework Programme are at an advantage compared to newcomers, even beyond the "normal" learning curve effect. They have experience in the administrative processes and can therefore spend less time on them.

However, if the complexity of the Framework Programme is not significantly reduced, high-potential research projects from less- or non-experienced researchers or from smaller organisations (such as SMEs) may be "missed" by the Programme and its successors.

In addition to these findings, the study identified the following simplification areas that merit serious attention by the Commission:

- remove differences of approach between Commission DGs and Directorates involved in FP7 (e.g. interpretation of rules, communication, training of Commission staff, etc…). A dedicated change management strategy in this respect and a coherent and holistic Business Process Management approach should be put in place to assure future consistency in approach between Directorates;
- simplify the 'rules for participation' by rationalising and reducing the number of funding schemes and cost models, remove the obligation to open a specific bank account for the project and implement the additional simplification measures listed by the Council on 12 October 2010[70];
- assess the feasibility of different options proposed for a "trust-based approach" to achieve a better balance between science and administration;
- offer the option of a direct contractual relationship only with the major partners in the consortium (instead of collaborative agreements). Small organisations and/or newcomers would be attracted by lighter administrative procedures, whereby they would have the status of subcontractors in a project and avoid more complex contractual procedures. The financial threshold above which audits become

69 The data collection conducted by the Commission on time spent when participating in FP7 projects via the online consultation mentioned here above shows different results as compared to the findings of this study, due to methodological differences between both surveys. This study only covers projects of the Cooperation Programme (no mono beneficiary projects such as Marie Curie, Coordination and Support Action, etc.). The scope of the Commission's online consultation was much broader in this respect. Furthermore, this study only collects data on time spent for administrative obligations and does not include the time spent on scientific tasks (also for the preparation of the proposal), which is another clear difference as compared to the Commission's consultation. For further details, please see Section 2.2.1. and Annex 3.

70 Council Conclusions on raising the attractiveness of EU Research and Innovation programmes: the challenge of simplification, 14980/10 of 12 October 2010 (http://register.consilium.europa.eu/pdf/en/10/st14/st14980.en10.pdf)

mandatory (EUR 375 000) could be an appropriate level of grant income below which participants could be subcontractors;

- align the administrative processes of FP7 with typical internal business processes of the beneficiaries. Ideally the Commissions internal business processes should be reengineered in such a manner that they establish a 'natural' link with the day-to-day business of participants, thus avoiding double work, irritation and additional administrative burden;
- publish "deadline-free" calls (calls that are continuously open and regularly assessed by an evaluation committee) in order to allow more flexibility for researchers;
- ensure the right balance between simplification and stability of the rules. If further simplification measures are selected, they should be tested against their stability over the next funding programmes. Ever-changing rules are often a cause of additional administrative burden and irritation rather than a lever for removing the negative effects of red tape;
- ensure audit traceability throughout the project life cycle, so that certain project decisions can be explained and errors can be avoided in the future. Much discussion and confusion about project decisions could be avoided if any change or decision is well-documented throughout the project;
- ensure flexibility in the implementation of rules, taking into account country-specific financial rules;
- use communication as a powerful simplification tool. FP programmes should be supported by a user-friendly research participants' portal incorporating clear guidelines. In addition, all communication (e-mails, letters, phone calls, RTD magazines and publications, etc.) should be consistent and the terminology used should be harmonised.

Naturally, the Commission should be guided by continuous monitoring of the effects of simplification measures implemented to date. Useful indicators such as:

- time to grant;
- time to pay;
- time to reply;
- time to find the right information (calls, guidance documents, specific rules applying to these documents); and
- time spent by EC officers (project/legal/financial) as well as coordinators and project partners in managing each step of the project life-cycle

should be used to measure the impact of simplification measures already introduced – and to assess the likely effect of further steps. In order to achieve this, an integrated approach to internal performance management, linking clear performance indicators to the Commission's business processes, could be put in place.

The Commission introduced three further measures in January 2011[71], (averaging of personnel costs, flat rate financing of SMEs and natural persons, and the creation of an internal "Research Clearing Committee). These are evidence of the Commission's continued willingness to improve the processes. While the first two are likely to affect only a limited number of participants and the potential impact of the third step remains unclear, they are welcomed by the research world as evidence of continuing attention to the remaining issues.

One task for which the new Research Clearing Committee could become responsible is tackling discrepancies of approach within the Commission and for continuously monitoring the achievement of simplification objectives. A successful initiative in centralisation of standardised and consistent communication, training of EC staff, the participants' portal, and consistency of interpretation of rules would improve the quality of the interactions with applicants and participants.

71 C(2011)174 Final Commission Decision of 24 January 2011 "on three measures for simplifying the implementation of Decision No 1982/2006/EC of the European Parliament and of the Council and Council Decision No 970/2006/Euratom and amending Decisions C(2007) 1509 and C(2007) 1625".

ANNEXES

Annex 1 Simplification under FP7

This section sets out the overall EU policy context and the current status of simplification under FP7.

- **Simplification in the context of the Better/Smart Regulation agenda**

Simplification of EU programmes is part of the European Commission's Better/Smart Regulation agenda[72] including the Action Programme on Reducing Administrative Burdens[73] coordinated by the Secretariat General.

The European Commission has an ambitious strategy to reduce the administrative burden for business by 25%. The Action Programme is high on the political agenda of the Commission, successive Council Presidencies and the Member States. The Better Regulation agenda aims at:

- simplifying existing legislation through a rolling simplification programme composed initiatives in all policy areas;
- reducing administrative burdens by at least 25% by 2012;
- placing greater emphasis on the use of impact assessments and public consultations when drafting new rules and regulations;
- monitoring the application of Community law.

The Better Regulation agenda is monitored and reviewed/reported on annually.[74] The agenda was updated with the publication of the Communication "Smart Regulation in the European Union"[75], which takes stock of the achievements so far and presents the Commission's key messages on roles and responsibilities in ensuring that smart regulation is embedded in the Commission's working culture.

- **Simplification in FP7**

The need to further simplify research framework programmes was identified in 2004 by an expert group on the "Evaluation of the effectiveness of the New Instruments of Framework Programme VI"[76].

72 http://ec.europa.eu/governance/better_regulation/index_en.htm

73http://ec.europa.eu/enterprise/policies/better-regulation/administrative-burdens/action-programme/index_en.htm

74 Strategic reviews of Better Regulation in the European Union in Commission Communications COM(2006) 689 of 14 November 2006, COM(2008)32 of 30 January 2008 and COM(2009)15 of 28 January 2009

75 Communication "Smart Regulation in the European Union", COM(2010) 543 final of 8 October 2010

76 Evaluation of the effectiveness of the New Instruments of Framework Programme VI - Report of a High-level Expert Panel chaired by Professor Ramon Marimon of 21 June 2004; http://cordis.europa.eu/documents/documentlibrary/66674081EN6.pdf

Key recommendations from that report included a significant simplification of administrative procedures and financial rules to ensure "more efficiency and flexibility in implementing participation instruments". The expert group also saw a need for:

- clear strategic objectives for the instrument, and clear guidelines and criteria for their use;
- a focus on instruments that are adapted to risk-taking, industry, participants from new Member States and to smaller players in general, including SMEs;
- the introduction of a "well conceived" two-step application procedure, i.e. a short proposal first, with selected projects only being invited to submit a full proposal).

More generally, the report stressed the importance of finding the right balance between changing the rules and the stability of the instruments, whereas in the past "flexibility and simplification (had) either not (been) delivered or are (had been) the source of new challenges".

The Commission's stressed in response [77] that the conclusions reached by the expert group to a large extent matched its own findings and that these had already led to the adoption of "corrective measures" to make the 6th Framework Programme more flexible and easier to use. It said measures which could only be implemented by making changes to the legal framework would be considered in connection with the preparation of the 7th Framework Programme and its legal framework.

However, the Commission did not agree with leaving the proposed freedom of choice of objectives and instruments entirely to participants or with certain statements by participants regarding the quality of the procedure for evaluating proposals.

The Commission therefore launched a study of financing mechanisms in order to explore possible ways of further relaxing participants' obligations while guaranteeing the necessary transparency in terms of the use of public funds.

Although it was felt that significant progress had been made in simplifying research framework programmes, the assessment of the impact of the new instruments introduced in FP6, published in 2009[78], largely repeated the same recommendations, which remain valid for FP7 so far.

77 Communication from the Commission responding to the observation and recommendations of the high-level Panel of independent experts concerning the new instruments of the 6th Framework Programme, COM(2004)574 final of 27 August 2004; ftp://ftp.cordis.europa.eu/pub/fp6/docs/energy_eag_eerawog.pdf

78 Assessment of the impact of the new instruments introduced in FP6 - EPEC study for DG Research, Final Report of 28 September 2009; http://ec.europa.eu/research/evaluations/pdf/archive/fp6-evidence-base/evaluation_studies_and_reports/evaluation_studies_and_reports_2009/assessment_of_the_impact_of_the_new_instruments_introduced_in_fp6.pdf

The simplification objectives of FP7 and related measures were introduced in the Commission proposal for a Decision on the Seventh Framework Programme[79] and detailed in the impact assessment and ex-ante evaluation[80] annexed to the proposal.

The Commission Staff Working Paper (CSWP) "Simplification in the 7th Framework Programme"[81] annexed to the Commission's FP7 proposal[82] recognised the complexity of the Framework Programme and indicated what simplification measures needed to be taken in order to make FP7 less complex (including for non-administrators) and in particular for smaller players.

In the Communication "Simplifying the Implementation of the Research Framework Programmes[83] ('Communication on Simplification'), published in 2010, the Commission describes the simplification measures already implemented under FP7:

- Reduction of ex-ante controls and revised protective measures for financially weak participants designed to ease the participation of SMEs and high-tech start-ups;
- Reduction of the number of certificates on financial statements to be provided with periodic cost claims;
- Introduction of a unique registration facility;
- Introduction of the possibility of ex-ante certification of the accounting methodology for recurring participants;
- Streamlining of project reporting requirements;
- Optimisation of IT tools;
- Improvements to the services and guidance documents for applicants.

The Communication also included a list of further simplification measures to be considered, having been identified in consultation[84] with stakeholders. These focus on the following remaining issues:

79 Commission Proposal for a Decision concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007 to 2013), COM(2005) 119 final of 6 April 2005; ftp://ftp.cordis.europa.eu/pub/fp7/docs/fp7_proposals_en.pdf

80 Communication Staff Working Document - annex to the Proposal for the Council and European Parliament decisions on the 7th Framework Programme (EC and Euratom): Impact Assessment and ex-ante evaluation (Main Report: Overall summary), SEC(2005)430 of 6 April 2005, in particular Annex 1, Chapter 6

81 SEC(2005)431 of 6 April 2005;

82 Proposal for a Decision of the European Parliament and of the Council concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007 to 2013), COM(2005)119 final of 6 April 2005, op.cit.; ftp://ftp.cordis.europa.eu/pub/fp7/docs/fp7_proposals_en.pdf

83 COM(2010)187 of 29 April 2010; http://ec.europa.eu/research/fp7/pdf/communication_on_simplification_2010_en.pdf

84 Public consultation "Ideas for simplifying the implementation of the EU Framework Programmes", open from 24/07/2009 to 30/09/2009 (http://ec.europa.eu/research/consultations/fp-simplification/consultation_en.htm)

- Access to the programmes and preparation of proposals (still seen as too difficult, in particular for newcomers);
- The high administrative burden for project administration and accounting;
- Time-to-grant and time-to-pay (still seen as too long).

The Communication also raised the issue of the error rates detected in ex-post audits, in particular for personnel and indirect costs. These remained above the materiality threshold defined by the Court of Auditors.

The additional simplification measures the Commission proposes for the future are listed below:

- **Streamlining proposal management and grant management under the existing rules:** short term improvements and simplifications, to be implemented under the current legal and regulatory framework, including further practical improvements to processes and tools:
  - User support, guidance, transparency, IT tools and processes;
  - Uniform application of rules;
  - Optimising the structure and timing of calls for proposals;
  - Adapting sizes of consortia;
  - More extended use of prizes.
- **Adapting the rules under the current cost-based system.** It is expected that this would accelerate the processes and contribute to a reduction of the error rate in the cost based approach, by:
  - Accepting usual accounting practices;
  - Using average personnel costs;
  - Limiting the variety of rules and special conditions:
    - Reducing the variety of different funding rates, organisation types and activity types;
    - Reducing the number of methods for determining indirect costs.
  - Adapting the rules linked to interest on pre-financing;
  - Increasing the use of lump sum elements in the current cost-based approach, including provision for owner-managers of SMEs; and
  - Accelerating project selection.
- **Moving towards result-based instead of cost-based funding:** Long-term changes towards result-based funding using lump sums would shift the control efforts from the financial to the scientific-technical side. The proposed steps are:
  - Providing project-specific lump sums as a contribution to project costs estimated during grant evaluation/negotiation, and paid against agreed output/results;

- Publishing calls with pre-defined lump sums per project in a given subject area and selection of the proposals promising the highest scientific output for the specified lump sum;
- Putting in place a high-trust "award" approach consisting of distributing pre-defined lump sums per project without further control by the Commission.

The FP7 Interim Evaluation[85], published in November 2010, concluded that simplification under FP7 had been partially successful. The report also highlighted the areas where simplification had been "disappointing":

- Time-to-grant[86];
- Reporting requirements;
- Inconsistency in the interpretation of rules and procedures, and their implementation.

The expert group listed a number of remaining issues, including problems with the IT tools, and referred to the simplification priorities set out in the Council conclusions on the Communication on Simplification adopted on October 12, 2010[8788]:

- Take following actions already with regard to the FP7:
  - Finalize and improve the research participant portal as soon as possible and by 2012 at the latest;
  - Introduce further transparency and traceability throughout the project cycle in particular with respect to providing timely and complete information to the Member States and the beneficiaries for all programmes, instruments and funding schemes, in particular regarding the JTIs and article 185 initiatives;
  - Provide clear guidelines and further reduce paperwork e.g. by reducing the amount of documents and by radically simplifying them (e.g. regarding timesheets and other time-recording mechanisms);
  - Continue efforts for improving access to public delivery of information on participation and call results in a central repository, thereby avoiding duplication of efforts and increasing efficiency of means;
  - Complete and test IT tools and processes before launching the CSF, in order to maintain them stable during CSF implementation, taking into account the need for user friendliness and uniformity where possible;

85 Interim Evaluation of the Seventh Framework Programme – Report of the Expert Group, Final Report of 12 November 2010. (http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/fp7_interim_evaluation_expert_group_report.pdf).
86 Time to grant is the interval between the deadline for bidding for funding in response to a call for proposals and the signature of a grant agreement (Source: MEMO/10/156 of 27 April 2010).
87 Council Conclusions on raising the attractiveness of EU Research and Innovation programmes: the challenge of simplification, 14980/10 of 12 October 2010 (http://register.consilium.europa.eu/pdf/en/10/st14/st14980.en10.pdf)
88 At the time of the Interim evaluation report, only the draft conclusions, dated 31 August 2010, were available (http://register.consilium.europa.eu/pdf/en/10/st12/st12920.en10.pdf)

- Take further steps in order to ensure uniform interpretation and application of the rules and regulations throughout the whole project cycle by those responsible (Project Officers, Auditors or different Executive Agencies, across DGs and units within the same DG) and reconsider the personal liability of European Commission officers for the correct execution of projects;
- Develop an enhanced FP- Mediation mechanism for disputes with participants at all stages of the process;
- Consider the simplification potential of two-stage application procedures for calls, giving more room for bottom-up, trans-disciplinary approaches, while ensuring that it will not lead to longer time to grant periods;
- Consider extending the use of prizes;
- Introduce more flexibility in the composition of consortia and their size;
- Develop synergies with other programmes (e.g. CIP, Structural Funds) and instruments (e.g. JTIs), inter alia, by means of common rules and procedures, whenever possible;

- Perform an international benchmarking exercise and experiment (when legal framework allows) with a new 'science-based' approach to funding of research projects, still to be defined, whereby the scientific and technological objectives, work plan and performance, the notion of risk and all the efforts of researchers must be taken into account, and acknowledging that anticipated scientific results cannot be guaranteed;

- Take following actions with regard to the forthcoming R&I Programmes:

  - Maintain different funding rates, indirect cost calculation models for different types of beneficiaries (e.g. universities, research organisations, industry and SMEs) and continue to support universities and other research organisations that wish to move towards full-cost accounting;
  - Use lump sums, including standard scale of unit costs, as an option on a voluntary basis. Such grants should be based on the expected efforts and resources to be deployed by each participant, irrespective of the type of participant (including SMEs) or its country of origin and in conformity with the national standards;
  - Perform an ex post evaluation of the actions mentioned in 3. d) xii and hold a full consultation involving all stakeholders in order to determine the best funding approaches establishing clear rules and regulations and defining all funding rates. In this exercise it should be kept in mind that the R&I programmes should foster an acceptable degree of risk taking and excellence;
  - Pursue examining if, inter alia, value added tax (where non-deductible) can be considered as an eligible cost item.

In January 2011, the Commission announced three specific simplification measures[89]:

- Revised criteria for the acceptance of average personnel costs as being eligible in FP7;
- Flat-rate financing for SME owners and other natural persons not receiving a salary;
- A Research Clearing Committee to ensure uniform interpretation and application of the rules and procedures relating to FP7 projects.

The Commission Green Paper on Research and Innovation funding programmes[90], published in February 2011, the Hungarian EU Presidency Conference on the Interim Evaluation of FP7 organised on 24-25 February 2011[91], and the Council Conclusions[92] on the FP7 evaluation of 9 March 2011 all drew attention to how reducing complexity and simplifying participation are important in FP7 and in the wider context of the future Common Strategic Framework for EU Research and Innovation funding.

89 Re-formulated in the COM(2011)52 Final of 9 February 2011. « On the Response to the Report of the Expert Group on the Interim Evaluation of the Seventh Framework Programme »
90 Green Paper "From challenges to Opportunities: Towards a Common Strategic Framework for EU research and Innovation funding", COM(2011)48 of 9 February 2011
91 See http://www.tetalap.hu/fp7interim/
92 3074th Competitiveness Council of 09.03.2011 on "Conclusions on the evaluation of the Seventh Framework Programme for Research (FP7), including the risk-sharing finance facility".

Annex 2 Evaluation and monitoring under FP7

Evaluation and monitoring in FP7 aims to provide a reliable source of systematically collected information to support FP management, as described in Article 7 of the Decision on FP7. This foresees a Progress Report on FP7, the FP7 Interim Evaluation, and an ex-post evaluation, and that the Commission[93] will "systematically monitor the implementation of (FP7) and its specific programmes and regularly report and disseminate the results of this monitoring"[94].

Performance in FP7 is monitored annually against the operational objectives set in the Proposal for FP7[95] and the annexed Commission Staff Working Document "Impact Assessment and ex-ante evaluation"[96] and on simplification[97].

The characteristics that a monitoring system should have were described in detail in a special report in 2007 from the Court of Auditors[98]. In this report, the Court of Auditors recommends "a limited, but balanced, set of performance indicators to measure the efficiency and effectiveness of programme implementation for each specific programme (and sub-programme)."

The FP7 monitoring system includes ten "indicators" and 35 "sub-indicators"[99]. The sources of information for the indicators are mainly the Common Research Data (CORDA) warehouse[100] which contains data on applicants and participants, the annual survey of National Contact Points (NCPs)[101], and reports and contributions addressing a number of horizontal and thematic issues. With more and more information being encoded, the new

93 Research Executive Agency when relevant

94 Decision No 1982/2006 of the European Parliament and of the Council concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013) of 18 December 2006 (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:412:0001:0041:EN:PDF)

95 Proposal for a Decision concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007 to 2013), COM(2009)119 of 6 April 2005

96 Commission staff working paper - Annex to the Proposal for the Council and European Parliament decisions on the 7th Framework Programme (EC and Euratom) - Main Report: Overall summary - Impact assessment and ex ante evaluation -{COM(2005) 119 final}, SEC/2005/430 final of 6 April 2005

97 Commission staff working document - Simplification in the 7th Framework Programme {COM(2005)119 final}, SEC/2005/431 final of 6 April 2005

98 Special report no. 9/2007 concerning 'Evaluating the EU Research and Technological Development (RTD) framework programmes - could the Commission's approach be improved'? together with the Commission's replies (2008/C 26/01); http://eur-lex.europa.eu/LexUriServ/LexUriServ.do%3Furi%3DOJ:C:2008:026:0001:0038:EN:PDF

99 See pages 69-70, Third Monitoring Report, 2010

100 See FP7 Subscription, Performance, Implementation during the first two years of operation, 2007-2008 European Commission, June 2009

101 See Section 2.2.

reporting system for project participants will gain further importance in the forthcoming annual FP7 monitoring reports.

Three annual monitoring reports have been published since FP7 was launched[102], as illustrated below:

Table 23: Overview of FP7 annual monitoring reports

Monitoring report	Publication date	Year covered
First FP7 Monitoring Report	13 February 2009	2007
Second FP7 Monitoring Report	1 October 2009	2008
Third FP7 Monitoring Report	13 July 2010	2009

In addition to the monitoring reports, DG Research & Innovation published a report in 2009 on FP7 Subscription, Performance, and Implementation during the first two years of operation[103].

102http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports
103 FP7 Subscription, Performance, Implementation during the first two years of operation (2007-2008), June 2009 (http://ec.europa.eu/research/reports/2009/pdf/fp7-1st-two-years-subscription-performance.pdf)

Annex 3 Overview of the study methodology

The scope and work plan of the study have been adapted in order to provide relevant information for the ex-ante impact assessment of the Rules for Participation for the next Framework Programme[104]. The analytical framework was adapted accordingly. As a consequence, the sources of information for the study have been shifted to desk research, case studies, the benchmarking study with three international organisations and workshops (with EC officials, including project officers) as well as a roundtable (with a range of stakeholders). Hence the key sources of information have become the case studies that are mostly qualitative and cover 90 interviews of Framework Programme participants. The benchmarking study included interviews with three international organisations.

The Commission completes quantitatively these data by the public consultation on simplification with a much bigger sample. This section provides an overview of the sources of information and the set-up of their analysis. In addition, the results of an internal management cost survey conducted by the Commission (hereafter referred to as 'costs of control survey') are being included in the analysis.

- **Desk research**

The desk research was an important source of data for all evaluation questions. It allowed to:

- Identify, describe and analyse in detail the simplification measures introduced under FP7;
- Conduct the investigation and analysis of the implementation and impacts of simplification measures introduced under FP7;
- Link our data to various sources such as the annual monitoring of the Framework Programme conducted by the Commission, but also the internal management cost survey and the public consultation on simplification conducted by the Commission respectively in 2009 and 2011.

The desk research includes position papers from stakeholders and a Deloitte study for the European Parliament. The list of references is provided in Annex.

- **Case studies**

Two types of case studies were conducted with 'Type I Case Studies' addressing the full FP7 project lifecycle and 'Type II Case Studies' focussing on the most burdensome steps.

The interviews provided baseline quantitative data on the time spent on administrative tasks within the FP7 project life cycle for participants (applicants and participants) and qualitative data on participants' assessment of the simplification measures within FP7. It is important to

104 Called so far the "Common Strategic Framework" (CSF).

emphasise that ONLY the time spent on administrative tasks, e.g. assembling the consortium be emails or phone calls or meetings, preparing the proposal from the organisation and budget point of view, negotiating from the same angle, and managing the project is included. The time spent on scientific activities such as writing the proposal or conducting research is excluded.

93 interviews were conducted (55 Type I and 38 Type II). For each research project, 3 interviews were conducted: one with the coordinator (administrative one if two coordinators), and two work-package leaders (or equivalent).

The type I questionnaire provides a baseline measure for the full project lifecycle process (see Annex 6) while Type II looks at some of the most burdensome steps: IT tools; financial reporting, contacts with the Commission regarding requests for project related information and feedback from reports; and the negotiation phase.

The Commission provided the sampled population, all coming from the Cooperation Programme to focus on the most important section of the Framework Programme. The sample was divided between 'focused' and 'large' projects defined by project funding (from EUR 2-3 million to 8-13 million), or by the number of partners (from 8-12 to 15-37 partners). One coordinator and two work package leaders were interviewed for each project. As the tables below summarises, the results are based on 87 usable interviews.

Table 24: Sampled population

Case studies population	Interviews	Usable interviews (exclude outliers)
Type I	55	49
Type II	38	38
Total	93	**87**

Source: Deloitte 2011

Table 25: Sampled population by type of interviewees (coordinators or work package leaders

Case studies population	Coordinators	Work package leaders
Type I	23	26
Type II	7	31
Total	**30**	**57**

Source: Deloitte 2011

Table 26: Sampled population by size of project (focused or large projects)

Case studies population	Focused projects	Large projects
Type I	34	15
Type II	20	18
Total	**54**	**33**

Source: Deloitte 2011

Table 27: Sampled population by level of experience with the FP (FP6/FP7 experience or no previous experience)

Case studies population	FP6/FP7 experience	No previous experience	Did no reply
Type I	28	5	16
Type II	32	6	0
Total	**60**	**11**	**16**

Source: Deloitte 2011

Outcomes of the case studies and the SCM methodology are presented in Section 2.2.1. The tables below show further breakdowns of the data:

Table 28: Average time spent by participants in hours for focused and large projects, 2011

Project life cycle steps	Average time spent for focused project	Average time spent for large project
Application/ selection of proposal	211	219
Negotiation of contracts	122	99
Project management (whole project duration up to the date of interview)	325	307
Ex-post audits	74	62
Total	**732**	**687**

Source: Deloitte 2011

Table 29: Average time spent by participants (coordinators and work package leaders) in hours for focused and large projects, 2011

Project life cycle steps	Average time spent by coordinators per project phase		Average time spent by work package leaders	
	Focused projects (16)	Large projects (7)	Focused projects (18)	Large projects (8)
Application/ selection of proposal	348	403	89	58
Negotiation of contracts	215	153	34	51
Project management (whole project duration up to the date of interview)	423	320	237	296
Ex-post audits	52	107	95	32
Total	**1038**	**983**	**455**	**437**

Source: Deloitte 2011

The two above tables show only minor differences between focused and large projects in terms of administrative obligations (the time spent on scientific tasks is not included) suggesting that the administrative burden is equal irrespective of the actual size of the project.

Type I and Type II questionnaires are presented in the following Annexes.

- **Benchmarking study - interviews with 3 major (inter)national research funding programmes**

The study team interviewed three major national or international research funding programmes to analyse implementation and simplification issues according to five criteria:

  - Call-based open competition;
  - Type of funding: basic or applied research;
  - Significant size of the budget;
  - Innovative policy to promote quality;
  - Pluri-thematic programmes (added during the design phase).

According to these criteria, the following three research funding programmes were selected:

  - The National Science Foundation (NSF),
  - The German Deutsche Forschungsgemeinschaft (DFG)
  - The French National Research Agency (ANR).

They are presented in Section 2.6. and the interview questionnaire is presented in Annex 6.

- **Workshop and round table**

A workshop with Commission staff including project officers was organized on March 9, 2011 to present the preliminary results of the study, and collect feedback. A roundtable with FP7 stakeholders was organized on April 8, 2011 to test the study's emerging findings with a selection of well-informed FP7 stakeholders. The agendas are presented in Annex. Conclusions were integrated in the report.

In addition, several interviews were also conducted with Commission officials to understand better the internal cost survey, the portal developments, and the public consultation on simplification.

- **The set-up of the data analysis**

The evaluation team conducted the analysis on the data collected for the Type I and Type II case studies. We present a detailed analysis of the time spent per type of FP7 participants: coordinators and work package leaders. Cases studies also provide view of participants on simplification measures and their suggestions for improvement. Furthermore, we try to link - at a general level - our findings to the internal management cost survey on time spent on project management by the Commission.

As part of the analysis, the evaluation team developed a set of recommendations for further simplification or adjustment of current FP7 simplification measures. For the most interesting simplification ideas, the evaluation team conducted a brief so-called I3 analysis (Impact, Implementability and Image). This implies assessing the Impact (in terms of time spent by participants) and Implementability (quick win with limited efforts or structural change with large investments) of these simplification ideas. Besides Impact and Implementability, the way a certain simplification initiative or action would be perceived (Image) by the stakeholders – Commission, FP7 participants or policy makers - is a final element to be taken into account. Image is therefore a third criterion in our assessment as it refers to the perception by the stakeholders. In the end, stakeholders will be key players determining the success of implementation. An assessment of the Image of a recommendation helps to identify possible accompanying measures to build a good business case for implementation, taking into consideration the stakeholders' point of view.

Annex 4 Evaluation questions

This Chapter presents our approach to the six evaluation questions. As significant time elapsed between the submission of the study proposal and the start of the contract, the Commission asked Deloitte to take into account recent developments and new information which meanwhile became available including that from other studies and through work performed by the Commission. The analytical framework for the study and thus the evaluation questions have been adapted accordingly and have been agreed upon in the Inception Report.

The following sub-sections explain the structure of our analysis; analyse the data in relation to each question, and present our findings and conclusions.

The first question is: Is the term "simplification" adequately understood by different stakeholder groups, and how do they understand its measurement and impact? This question is further divided into sub-questions as follows:

- 1a. In detail, where and how have the simplification measures introduced under FP7 affected and shaped the project life cycle?
- 1b. Were the procedures for the implementation of the different simplification measures well managed in terms of availability of information, transparency and speed?
- 1c. How can simplification and the effects of related measures introduced under FP7 be identified and measured at multiple levels?
- 1d. What are the direct effects of the implemented simplification measures as regards FP7 project management (FP7 users and Commission Services)?
- 1e. What are the (broader) impacts of the implemented simplification measures at multiple levels, including so-called "soft factors[105]"?
- 1f. Overall, to what extent were the simplification measures introduced under FP7 successful so far?
- 1g. What is the application and management cost for participants and management cost for the EC of an FP7 project taking into account the full project life cycle (from preparing the call to auditing the results of the project)?

For the sake of clarity, and in order to follow the logical flow of the analysis, sub-questions related to measuring the effects and impacts of simplification measures introduced under FP7 have been clustered and re-ordered under Section 2.2. These sub-questions cover:

105 Such as communication and informal processes in the organisation.

- The current situation: application and management costs for participants and management costs for the European Commission of an FP7 project, taking into account the full project life cycle (Question 1g);
- The effects of simplification measures: direct effects (Question 1d) and broader impacts (Question 1e) of the implemented simplification measures;
- Recommendations on how to measure the effects of simplification (Question 1c).

Other sub-questions are answered individually.

While Question 1 deals with the simplification measures introduced under FP7, Questions 2 and 3 deal with mapping the actors in the simplification process and their respective roles:

Question 2: What are the respective roles of the key actors in implementing simplification and securing resulting change? including their role in overcoming barriers to simplification and actually implementing the simplification ideas.

Question 3: What are the barriers to real change and what is being done by the key actors and at multiple levels to address these?

Question 4 focuses on the way simplification is dealt with in a selection of programmes in the research landscape worldwide and on identifying good practices for future development of Framework Programmes, i.e. Although FP7 has no obvious comparators, assess how "simple" and "user-friendly" FP7 is in relation to other large research programmes, e.g. the National Science Foundation NSF? Are there different approaches which could deliver better results?

Question 6: What efforts are already foreseen to simplify FP7 further and are these likely to create the desired results at reasonable cost? covers the further simplification measures planned in a broader context (including the measures announced in January 2011, the Innovation Union, and the opportunity to shift research towards a more "trust-based" funding approach – see further).

Finally, Question 5: What are the risks associated with various forms of simplification and how have these been balanced against the benefits? assesses the risks and benefits linked to past, proposed and other possible simplification measures identified in the study, in particular through our benchmarking exercise (Question 4). This is the final question to be addressed because of its overarching nature: The simplification measures are assessed in terms of image, impact and implementability, following the "I3 methodology" developed by the Consortium of Deloitte, Capgemini and Ramboll Management Consulting as part of the Action Programme on Administrative Burdens[106].

106 http://ec.europa.eu/enterprise/policies/better-regulation/administrative-burdens/action-programme/index_en.htm

Answers to the evaluation questions can be found in the following sections:

Table 30: Answers of the evaluation questions in the Final report

Sections	Questions
2.1.	1 a, f
2.2.	1 g, d, e, c
2.3.	2, 3
2.4.	5, 6
2.5.	1b
2.6.	4

For each evaluation question, as clustered in the report, our understanding of the question and the main data sources are listed in the sections below

Questions 1 g, d, e, c: Measuring the relative time spent, effects and impacts of simplification measures under FP7

This sub-section aims at answering the questions related to measuring the effects and impacts of simplification measures introduced under FP7. They are addressed in the following order:

- Question 1g: "What is the application and management cost for participants and management cost for the EC of an FP7 project taking into account the full project life cycle (from preparing the call to auditing the results of the project)?".
- Question 1d: "What are the direct effects of the implemented simplification measures as regards FP7 project management (FP7 users and Commission services)?"; and Question 1e: "What are the (broader) impacts of the implemented simplification measures at multiple levels, including so-called "soft factors?"
- Question 1c: "How can simplification and the effects of related measures introduced under FP7 be identified and measured at multiple levels?"

These questions are part of the seven sub-questions under Question 1 "Is the term "simplification" adequately understood by different stakeholder groups? How do they understand its measurement and impact?". They have been grouped in order to follow the logic of the analysis, from the assessment of the current situation (Question 1g) to its effect (direct in Questions 1d and broader in Question 1e), to recommendations on how to measure the effect of simplification (Question 1c).

We have developed indicators for forming a judgment on the effects and impacts of simplification measures introduced under FP7 and how can they be identified and measured at multiple levels. They stem from the desk research, including process and organisation analysis, interviews using the Standard Cost Model (SCM) and expert panels.

The Standard Cost Model (SCM) is today the most widely applied methodology for measuring administrative costs. The SCM has been developed to provide a simplified, consistent method for estimating the administrative costs imposed on business by government. It takes a pragmatic approach to measurement and provides estimates that are consistent across policy areas. The SCM methodology is an activity-based measurement of the businesses' administrative burdens Results of Standard Cost Model measurements are directly applicable in connection with government simplification efforts.[107]

In order to be able to provide useable data, we have tailored the SCM methodology to the specificities of FP7.

Question 1b: Timeliness and clarity of communication about simplification measures under FP7

This sub-section aims to answer the question: "Were the procedures for the implementation of the different simplification measures well-managed in terms of availability of information, transparency and speed?"

This question is the second of seven sub-questions under Question 1 "Is the term "simplification" adequately understood by different stakeholder groups? How do they understand its measurement and impact?" which was taken as a starting point for subsequent discussion about the effectiveness of simplification measures under FP7.

This section focus on assessing the availability, timeliness, quality and structure of information about FP7 in general and in particular related to simplification measures. It implies taking into account the point of view of the beneficiaries, as well as other stakeholders such as organisations supporting beneficiaries, including National Contact Points (NCPs).

Our indicators for forming a judgment on whether the procedures for the implementation of the different simplification measures were well managed in terms of availability of information, transparency and speed come from: desk research; process and organisation analysis; FP7 participant case studies (interviews); and expert assessment. In order to ensure coverage of the different stakeholder groups, these sources of information were reinforced by data from the FP7 annual monitoring reports, in particular the NCP surveys, position papers from stakeholders (desk research and analysis of the public consultation on simplification[108]),

107 http://www.administrative-burdens.com/default.asp?page=122
108 Ideas for simplifying the implementation of the EU Framework Programmes (http://ec.europa.eu/research/consultations/fp-simplification/consultation_en.htm)

complementary interviews with EC staff[109] and validation of our main findings with stakeholders[110].

Questions 1a, f: Expert assessment of the success of simplification measures

This sub-section aims to answer the questions in the analytical framework:

- Question 1a: "In detail, where and how have the simplification measures introduced under FP7 affected and shaped the project life cycle?";
- Question 1f: "Overall, to what extent were the simplifications measures introduced under FP7 successful so far?".

While question 6 below focuses on additional simplification measures which have been announced and further simplification opportunities, this question focuses on the effectiveness of simplification measures implemented under FP7 so far. It provides:

- an overview of simplification under FP7 so far:
  - simplification objectives in FP7 (based on issues raised about FP6);
  - simplification measures implemented so far;
- a description of the FP7 project life cycle and an assessment of the effects of the simplification measures taken to date correlated with the project life cycle.

The information on the simplification objectives and related simplification measures implemented so far were identified from the 2010 Communication on Simplification. The project life cycle was established following the structure used by DG Research & Innovation.

The indicators for forming a judgment on where and how the simplification measures introduced under FP7 have affected and shaped the project life cycle come from desk research, including a process analysis, and FP7 participants' interviews (case studies). In order to ensure coverage of the different stakeholder groups, the sources of information were reinforced by position papers from stakeholders (desk research) and complementary interviews with European Commission staff.

The main desk research sources in addition to the above-mentioned policy documents were:

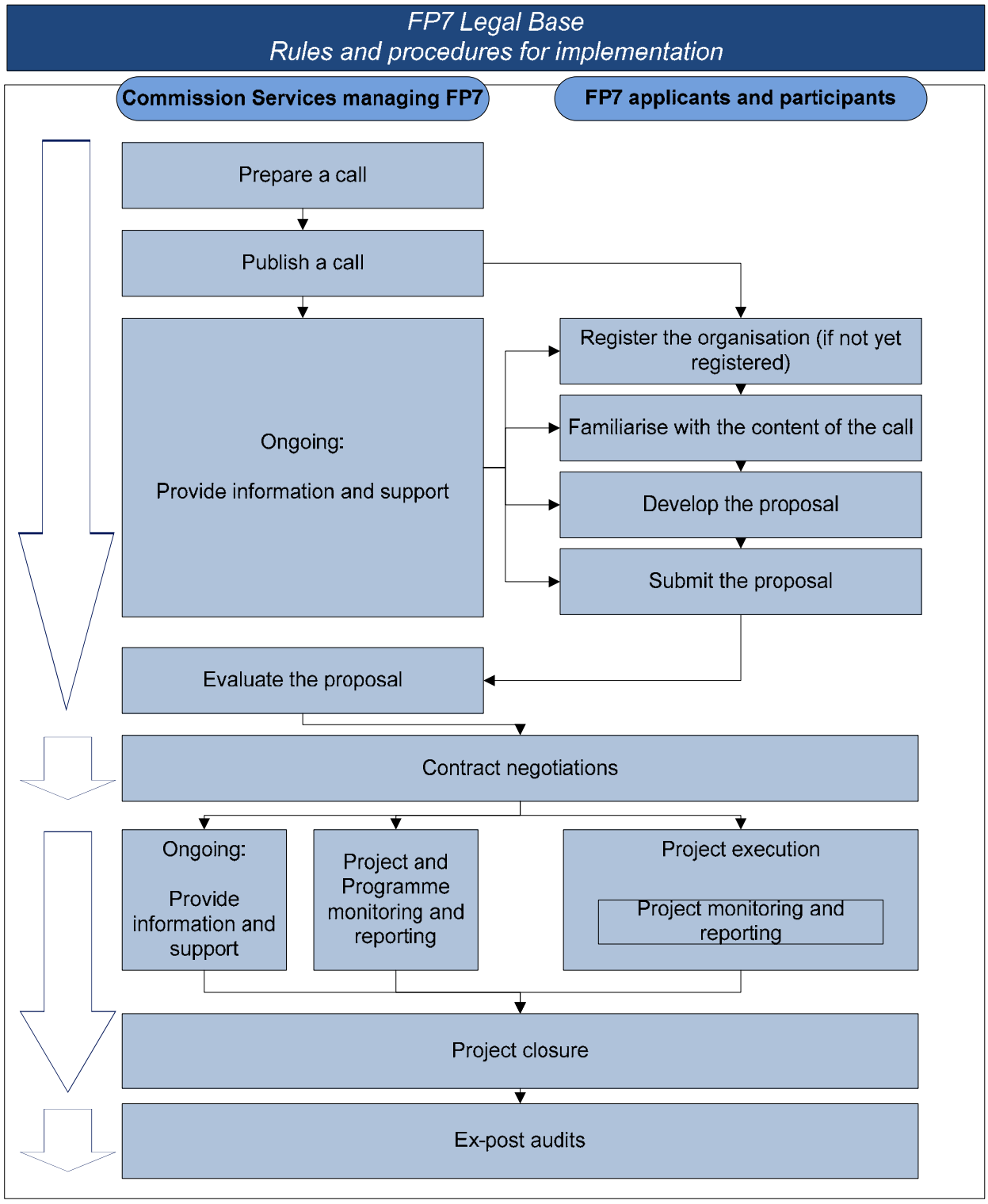
- Rules for submission of proposals, and the related evaluation, selection and award procedures[111];
- Specific guidance documents to be found on CORDIS[112].

A generic project life cycle view of FP7 was developed to serve as the framework for this study. It describes, from a functional point of view, the different steps within any project life

109 Interview with EC staff, and internal EC workshop organised on March 9, 2011 in Brussels.
110 The roundtable took place on 8 April 2011
111 Rules for submission of proposals, and the related evaluation, selection and award procedures, COM(2008)4617, Version 3, 21 August 2008 (ftp://ftp.cordis.europa.eu/pub/fp7/docs/fp7-evrules_en.pdf)
112 http://cordis.europa.eu/fp7/find-doc_en.html

cycle undertaken by the Commission services as well as by the FP7 applicants and participants. This is illustrated in the figure below.

Figure 6: FP7 Generic Project Life Cycle



Source: Deloitte

The activities carried out in parallel by the Commission and by project applicants and beneficiaries were set down in detail, as illustrated below.

Table 31: FP7 project life cycle and the related activities carried out by Commission and project participants and participants

European Commission[113]	Project life cycle phase	Project applicants/ participants (coordinator and partners)
• Prepare and define the annual work programmes • Plan and coordinate the calls • Evaluate proposals received • Carry out related work (including redress procedures) until the final list of approved proposals has been signed by the Director-General and submitted for inter-service consultation	**Applications/ Selection of proposals**	• Find a suitable call and partners • Register your organisation • If relevant (two-stage proposal only): second stage • Become familiar with the content of the call, and the application and submission rules • Develop proposal • Submit proposal • Hearing (if applicable)
All tasks performed during the detailed negotiation of the selected proposals up to the time when projects' draft contracts and the Commission decisions are sent to the applicants. This stage covers all controls until the favourable decision is obtained	**Negotiation of contracts**	• Redress procedure (if applicable) • Become familiar with negotiation mandate • Become familiar with the negotiation rules • Develop DoW (Description of Work) and GPFs (Grant Agreement Preparation Forms) • Negotiation meeting(s) (internal or with Commission) • Submit DoW (Description of Work) and GPFs (Grant Agreement Preparation Forms) • Grant agreement signature • Consortium agreement
• The financial operations related to expenditure defined in the Financial Regulation, i.e. the establishment of the Commission's individual and legal commitments in the form of a signed grant agreement • Financial management (pre-financing, intermediate and final payment) • All the scientific work necessary for the approval of the non-financial deliverables required to clear the payments	**Project Management**	• Contact with the Commission • Become familiar with project management rules • Project execution, monitoring and closure • Review by a group of independent experts (if applicable) and implementation of its outcomes • Amendments to contracts • Internal consortium/partnership management

113 Including external experts who participate in the selection process

European Commission[113]	Project life cycle phase	Project applicants/ participants (coordinator and partners)
• The work of the ex-post audit units M1 and M2. • Some work required from the operational units in terms of putting together documentation for selected projects, in preparation of the audits • Work on discussion points between the DG and the beneficiaries, until the audit results are finalised • The time spent dealing with forecasts of revenue, recovery orders, extrapolation, exchange of correspondence and contacts with the beneficiaries to deal with these issues	**Ex-post audits**	• Become familiar with audit rules • Gather information • Deal with requests for audit compliance • Audit follow-up

Source: Deloitte 2011, based on definitions used for a Commission "Internal management cost survey" (2010)

Questions 2, 3: Key actors of FP7 simplification and their role in making it a reality

This sub-section aims at answering two questions:

- Question 2: "What are the respective roles of the key actors in implementing simplification and securing resulting change?"
- Question 3: "What are the barriers to real change and what is being done by the key actors and at multiple levels to address these?"

These questions have been grouped in order to follow the logic of the analysis. The section on Question 2 will present a mapping of the actors in the simplification process and their respective role, while Question 3 will provide an overview of the main barriers to simplification and the role played by these stakeholders to make simplification a reality.

The indicators for forming a judgment on the respective roles of the key actors in implementing simplification and securing resulting change, and on the barriers to real change and what is being done by the key actors and at multiple levels to address these come from the desk research, including a process analysis complemented by an expert assessment.

The desk research included the results of the published consultations of stakeholders on FP7 issues by the Commission over the last few years. An overview of these consultations is presented in the table below.

Table 32: Overview of stakeholder consultation related to simplification in FP7

Title of the Consultation	Date	Objective	Outcome
Science and Technology, the key to Europe's future: Guidelines for future European Union policy to support research	2004	Preparation of FP7	Published[114]
FP7 – Rules for participation – simplification measures	2005	Collection of stakeholder feedback about the ten proposed measures for simplification contained in the staff working document on simplification that accompanied the Commission proposal on FP7 Collection of inputs from participants on other issues that would be addressed by the Rules for Participation, such as intellectual property provisions, evaluation criteria, collective financial responsibility and other participation principles.	Not published
Practical guide to EU funding for research, development & innovation	2008	Provision of the opportunity to potential users of the Practical Guide to provide comments and suggestions on how to make the text more practical and user-friendly.	Not published
Ideas for simplifying the implementation of the EU Framework Programmes[115]	2009	Preparation of the 2010 Communication on simplification.	Summary of outcomes published[116]; access granted to the position papers
Consultation on the Seventh Framework Programme[117]	2010	Preparation of the FP7 Interim Evaluation	Not published
Consultation on Green Paper – towards a Common Strategic Framework for EU research and innovation funding[118]	2011	Collection of views on bringing together the current Framework Programme for research, the Competitiveness and Innovation Programme, and the European Institute of Innovation and Technology.	NA

Source: Deloitte 2011

114 http://ec.europa.eu/yourvoice/results/research/future_fp7.pdf
115 http://ec.europa.eu/research/consultations/fp-simplification/consultation_en.htm
116 http://ec.europa.eu/research/consultations/fp-simplification/outcome_summary_en.pdf
117 http://ec.europa.eu/research/consultations/fp7/consultation_en.htm
118 http://ec.europa.eu/research/consultations/csfri/consultation_en.htm

Question 4: Ideas from other large research programmes: could different approaches deliver better results?

This sub-section aims to answer the question: "Although FP7 has no obvious comparators, assess how "simple" and "user-friendly" FP7 is in relation to other large research programmes, e.g. NSF. Are there different approaches which could deliver better results?"

The objective of this question is not to compare FP7 with other programmes or to rank them, but to assess its user-friendliness against relevant programmes in the research landscape worldwide and to identify good practice for future developments of FPs. We will focus here on the project life cycle, user-friendliness and simplification measures.

To answer this question, it was agreed with the Commission to focus on programmes managed by the three following research organisations:

- National Science Foundation (hereafter NSF), United States;
- German Research Foundation (Deutsche Forschungsgemeinschaft, hereafter DFG), Germany;
- National Research Agency (Agence Nationale de la Recherche, hereafter ANR), France.

The indicators for forming a judgment on how "simple" and "user-friendly" FP7 is in relation to other large research programmes and on whether there are different approaches which could deliver better results come from desk research and interviews with representatives of the above-mentioned organisations.

In order to ensure a broader picture, the benchmarking exercise was further extended to other sources and organisations, in particular in relation to a Commission survey on result-based funding and simplification practices in research organisations worldwide. Following the publication of the Green Paper "From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding"[119] on 9 February 2011 (which was also included in the desk research), it was also decided to include the Competitiveness and Innovation Framework Programme (CIP) ICT/FET in the benchmark.

Furthermore, FP7 participants interviewed for this study were also asked to identify good practices in other programmes and organisations and to what extent they would be applicable to FP7.

119 Green paper "From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding", COM(2011) 48 of 9 February 2011

The perceptions of NCPs whose views were sought as part of two FP7 monitoring reports have also been taken into account. Data was also collected on the relevance of the negotiation stage in the project life cycle and the role of control in the project life cycle.

Questions 5, 6: Efforts already foreseen to simplify FP7 further and further ideas

This sub-section aims to answer the questions:

- Question 5: "What are the risks associated with various forms of simplification and how have these been balanced against the benefits?"
- Question 6: "What efforts are already foreseen to simplify FP7 further and are these likely to create the desired results at reasonable cost?".

While Question 1a-f focused on the effectiveness of simplification measures implemented so far, the objective of this chapter is to:

- Provide an overview of further simplification measures as decided by the Commission and proposed by this study;
- Assess their cost-effectiveness;
- Assess the balance between the risks and benefits linked to these measures.

This section focuses on recommendations to both Applicants and Participants, and the Commission. These recommendations are achievable by improving current procedures and do not require the approval from the Council or the Parliament.

The indicators for these questions come from the desk research (including benchmarking) and FP7 participant interviews (case studies).

Preliminary findings were also discussed with stakeholders in a workshop[120] with EC officials and in a roundtable[121] bringing together representatives from the main national research organisations (see also Annex 3).

Findings from previous questions will also be used:

- Barriers to simplification as identified in Question 3: for four of the seven barriers identified, the Commission can play an active role:
    - Control (vs. trust) approach;

120 The workshop took place on 9 March 2011
121 The roundtable took place on 8 April 2011

    - Lack of consistency in management of FP7 (interpretation, communication, performance, etc.);
    - Lack of timeliness in feedback (time to reply); and
    - Lack of interface role in project coordination.
- In addition, further simplification measures identified in Question 4 will be analysed against their cost and expected results, risks and benefits.

The 3"I" framework designed for the Action Programme for Administrative Burden Reduction will be used to assess risks and benefits.

Annex 5 Desk research

The table below gives an overview of all documents taken into account for the desk research.

Document name	Author	Reference/Source	Publication date	Information category
Conclusions on the evaluation of the Seventh Framework Programme for Research (FP7), including the risk-sharing finance facility	Council	3074th Competitiveness Council	09.03.2011	Simplification/ FPs
From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding	EC	Green paper (2011) 048	9.02.2011	FP7
Commission Decision "on three measures for simplifying the implementation of Decision No 1982/2006/EC of the European Parliament and of the Council and Council Decision No 970/2006/Euratom and amending Decisions C(2007) 1509 and C(2007) 1625"	EC	C(2011)174 Final	24.01.2011	Simplification/ FPs
Interim Evaluation of the Seventh Framework Programme - Report of the Expert Group	Expert Group	NA	12.11.2010	FP7 Evaluation
Annual Report concerning the financial year 2009	CoA	NA	9.11.2010	Audit/TRE
Council Conclusions on Raising the attractiveness of EU Research and Innovation programmes: the challenge of simplification	Council	3035th Council meeting Competitiveness (Internal Market, Industry, Research and Space)	12.10.2010	Simplification/ FPs
Turning Europe into a true Innovation Union	Commission /Press	MEMO/10/473	6.10.2010	Innovation policy
Report on simplifying the implementation of the Research Framework Programmes	EP (Rapporteur: Maria da Graça Carvalho)	A7-0274/2010	6.10.2010	Simplification/ FPs
Making EU research and innovation programmes more attractive: the simplification challenge - Adoption of Council Conclusions	Council	13959/10 RECH 300	6.10.2010	Simplification/ FPs
Europe 2020 Flagship Initiative Innovation Union	Commission	COM(2010) 546 final	6.10.2010	Innovation
PROPOSAL AND AWARD POLICIES AND PROCEDURES GUIDE	NSF	NSF 11-1 OMB Control Number: 3145-0058	1.10.2010	Benchmarking

NEGOTIATION GUIDANCE NOTES	Commission	Version 10 September 2010	10.09.2010	FP7
Consultation on Simplification - Positions	Stakeholders (various)	DG RTD A3	1.09.2010	Simplification/ FPs
The Simplification of Framework - Programmes for research	Council (informal)	NA	20.07.2010	Simplification/ FPs
Draft Report on simplifying the implementation of the Research Framework Programmes - AMENDMENTS	MEPs		16.07.2010	Simplification/ FPs
Meeting of Research Ministers in Brussels: Simplify the European research programmes and trust researchers.	Council (informal)	NA	16.07.2010	Simplification/ FPs
Presentation to the Belgian Presidency event - Simplification Seminar	MEP Carvalho (EP)	www.eutrio.be	15.07.2010	Simplification/ FPs
Presentation to the Belgian Presidency event - Simplification Seminar	Paradis (EC-DG BUDG)	www.eutrio.be	15.07.2010	Financial Regulation/ Simplification
Presentation to the Belgian Presidency event - Simplification Seminar	Rod (EUROHORC)	www.eutrio.be	15.07.2010	Simplification/ FPs
Presentation to the Belgian Presidency event - Simplification Seminar	van Dijk (LERU)	www.eutrio.be	15.07.2010	Simplification/ FPs
Presentation to the Belgian Presidency event - Simplification Seminar	Coda (EUCAR)	www.eutrio.be	15.07.2010	Simplification/ FPs
Informal Research council on 15 and 16 July - The priorities	Council (informal)	NA	15.07.2010	Innovation policy/ simplification
The Research and Industry Ministers want to provide Europe with an ambitious and integrated strategy with regard to innovation	Council (informal)	NA	15.07.2010	Innovation policy
Invitation to a Belgian Presidency event - Simplification Seminar	Council	www.eutrio.be	1.07.2010	Simplification/ FPs
Draft Report on simplifying the implementation of the Research Framework Programmes	EP (Rapporteur: Maria da Graça Carvalho)	2010/2079(INI)	23.06.2010	Simplification/ FPs
Proposal for a Regulation on the Financial Regulation applicable to the general budget of the European Union	Commission	COM(2010)260	28.05.2010	Financial Regulation/ Simplification

Conclusions on simplified and more efficient Programmes supporting European Research and Innovation	Council	3015th COMPETITIVENESS Council meeting	26.05.2010	Simplification/ FPs
Conclusions on Creating an innovative Europe	Council	3016th COMPETITIVENESS Council meeting	26.05.2010	Innovation policy
Communication - More or less controls? Striking the right balance between the administrative costs of control and the risk of error	Commission	COM(2010)261 final	26.05.2010	Audit/TRE
Developing the tolerable risk of error concept for the research, energy and transport policy area	Commission	SEC(2010)641	26.05.2010	Audit/TRE
Financial Rules in the Research Framework Programmes - Streamlining rules for participation in EU research programmes	EP/Deloitte	PE 411.275	26.05.2010	Financial Regulation/ Simplification
CONSULTATION REPORT - Second triennial review of the Financial Regulation	Commission (DG BUDG)		1.05.2010	Financial Regulation/ Simplification
Communication "Simplifying the implementation of the research framework programmes"	EC/ DG RTD	COM(2010) 187	29.04.2010	Simplification/ FPs
Commission to boost research and innovation by making it easier to apply for and manage EU grants	EC/Press	IP-10-472	29.04.2010	Simplification/ FPs
Opening Remarks at the Press Conference on Simplification of Research Funding	EC/Press	SPEECH-10-194	29.04.2010	Simplification/ FPs
Commission to cut further red tape in research funding procedures - Questions and Answers	EC/Press	MEMO-10-156	29.04.2010	Simplification/ FPs
European Parliament resolution on the draft general budget of the European Union for the financial year 2010 as modified by the Council	European Parliament		17.12.2009	FP7
Simplification of the recovery process in the framework of the implementation of the audit strategy under the Framework Programmes (EC, Euratom) for research	European Commission/ Mr Potočnik in agreement with vice-president Kallas	SEC(2009) 1720 final	15.12.2009	FP7
Certificates issued by external auditors – Guidance notes for beneficiaries and auditors	Commission	version 3	1.09.2009	FP7

Communication on the progress made under the 7th European Framework Programme for Research	Commission	COM(2009) 209 final	29.04.2009	FP7 Evaluation
Commission Staff Working Document on Communication on the progress made under the 7th European Framework Programme for Research	Commission	COM(2009) 209 final	29.04.2009	FP7 Evaluation
Guide to Financial Issues relating to FP7 Indirect Actions	Commission	Version 02/04/2009	2.042009	FP7
Commission decision on flat rates	Commission	C(2009)1942	23.03.2009	FP7
FP7 “Negotiation Guidance Notes”	Commission	Version 27/01/2009	27.01.2009	FP7
Rules for submission of proposals, and the related evaluation, selection and award procedures	Commission	COM (2008) 4617, version 3	21.08.2008	FP7
Council Decision concerning the Specific Programme Cooperation implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)	Council	2006/971/EC	19.12.2006	FP7
Council Decision concerning the specific programme: Ideas implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)	Council	2006/972/EC	19.12.2006	FP7
Council Decision concerning the specific programme People implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)	Council	2006/973/EC	19.12.2006	FP7
Council Decision on the Specific Programme: Capacities implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)	Council	2006/974/EC	19.12.2006	FP7
Council Decision concerning the Specific Programme to be carried out by means of direct actions by the Joint Research Centre under the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)	Council	2006/975/EC	19.12.2006	FP7
Council Decision concerning the Specific Programme implementing the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)	Council	2006/976/Euratom	19.12.2006	FP7

Council Decision concerning the Specific Programme to be carried out by means of direct actions by the Joint Research Centre implementing the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)	Council	2006/977/Euratom	19.12.2006	FP7
Council Regulation (Euratom) laying down the rules for the participation of undertakings, research centres and universities in action under the Seventh Framework Programme of the European Atomic Energy Community and for the dissemination of research results (2007 to 2011)	Council	No 1908/2006	19.12.2006	FP7
Decision concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013)	European Parliament and of the Council	No 1982/2006/EC	18.12.2006	FP7
Council concerning the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007-2011)	Council	969/2006/EC	18.12.2006	FP7
Council Decision concerning the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)	Council	2006/970/Euratom	18.12.2006	FP7
Regulation (EC) laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013)	European Parliament and of the Council	1906/2006	18.12.2006	FP7
The effectiveness of the Design Studies and Construction of New Infrastructures support schemes under the Sixth Framework Programme for Research	CoA	ISSN 1831-0834	2.07.1905	Audit/TRE
Networks of excellence' and 'Integrated projects' in Community Research policy: did they achieve their objectives?	CoA	ISSN 1831-0834	1.07.1905	Audit/TRE

Annex 6 Questionnaires (for Type I & Type II Case Studies and international organisations)

Questionnaire for Type I Case Studies

Date of the telephone interview	
Time	
Name organization:	
Interviewee(s)	
Role in the organisation	
Role in the project	
Interviewer	
Phone number	
Mobile phone	
Email	
Comment(s)	

All information collected will be processed anonymously and presented in an aggregated way in the final report. This information will not be used for any other purpose than the study itself and will not be disclosed to third parties.

Introduction

Background

Deloitte Consulting was mandated by European Commission, DG Research, to carry out an analysis of administrative simplification measures under FP7.

Deloitte will interview 90 project participants. The objective of the interview will be to:

- Assess the time spent in FP7 project related activities from application to project closure/audit;
- Get interviewee's perception of simplification measures implemented so far and their suggestions for improvement in this area.

The Commission proposed a list of 60 ongoing or completed collaborative projects under the Cooperation programme. Deloitte contacted the project officers for these projects in order to know more about the project itself (background and status) and the project partners (roles, contact details). Based on these conversations with the Project Officers, Deloitte selected 30 projects for which the project coordinator and two project partners (priority will be given to work-package leaders) will be interviewed.

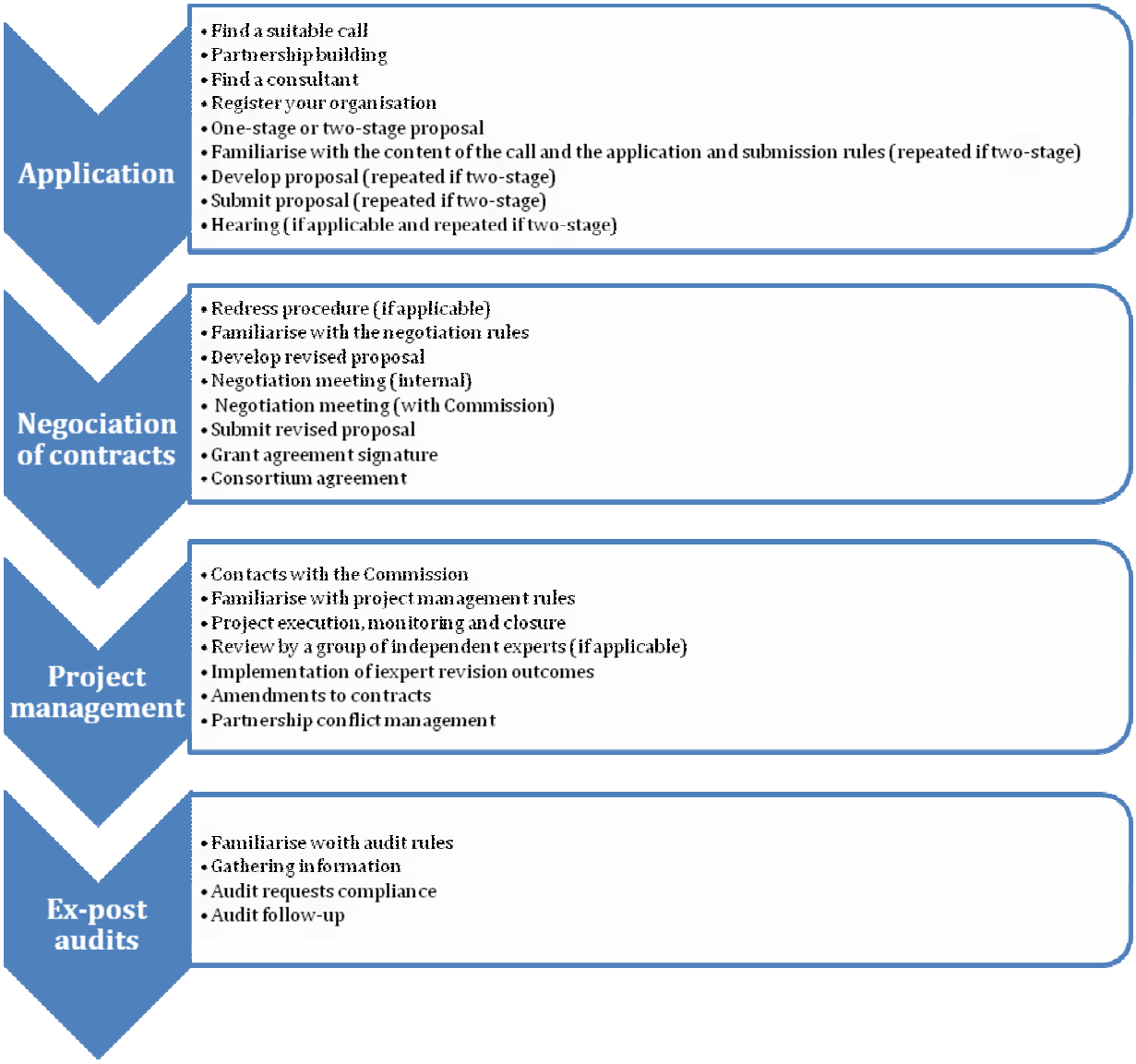
The success of the study assessing the effectiveness of simplification measures under FP7 and any resulting proposals for the reduction of the administrative costs related to the projects under FP7 or FP8 will be largely dependent on the quality of the data collected during this measurement phase.

The questionnaire below is addressed to organisations coordinating or having been involved in administrative activities (i.e. leading a work package or similar) in one of the 30 FP7 projects selected for the case studies.

In the organisation, the interviewee needs to be aware of the time spent in FP7 project related activities. Most of the time, the interviewee will be either the scientific coordinators in charge of the administrative management of the project for their organisation or the administrative coordinators of the project (or both). Overall, addressing these questions and engaging in the telephone interview should only take up a limited amount of your time (between 30 minutes and 1 hour).

Instructions

The interview guide is structured along the logic of the FP7 project lifecycle (see figure below), with additional questions about simplification.



Questionnaire

Application phase

- How long did it take you (your organisation) to search for a suitable call for proposal to address the research project needed?

	HOURS
Comments	

- How many hours did it take you (your organisation) for partnership building (including finding new partners, confirming known partners)

	HOURS
Comments	

- How many hours did it take you (your organisation) to find a consultant or short term contractor to develop proposal (if applicable)

	HOURS

Comments	

- How many hours did it take you (your organisation) to register your organisation / Unique Registration Facility (URF)

	HOURS

Comments	

- Was your proposal a one-stage/two-stage proposal?

First proposal stage

- How many hours did it take for you (your organisation) to familiarise with the content of the call for proposal and rules?
  - Access to information prior to call publication (CORDIS + NCPs + participants portal, programme committee, etc.)

	HOURS

  - Find the right information when the call is published

	HOURS

  - Understand the rules

	HOURS

  - Get additional information about the rules (CORDIS, NCP, EEN, REA, etc.)

	HOURS
Comments	

- How many hours did it take for you (your organisation) to develop the proposal?
  - Contents/technical agreement with partners (including DoW (Description of Work) and distribution of work packages/scientific and administrative tasks)

	HOURS

  - Ethical issues (if applicable)

	HOURS

  - Intellectual property issues (if applicable, in particular if industry onboard)

	HOURS

  - Gender issues (if applicable)

	HOURS

  - Security issues (if applicable)

	HOURS

  - External consultant / short term contractor time spent to develop proposals (if applicable)

	HOURS
Comments	

- How many hours did it take for you (your organisation) to:
  - Submit the proposal with the Electronic Proposal Submission Service (EPSS) (coordinator only)?

	HOURS

  - Insert changes in the proposal with the Electronic Proposal Submission Service (EPSS) (coordinator only)?

	HOURS
Comments	

- In case your organisation participated in a hearing, how many hours did it take you (your organisation) to:
  - Prepare the hearing

	HOURS

- Participate in the hearing

	HOURS
Comments	

Second proposal stage (if applicable)

- How many hours did it take for you (your organisation) to familiarise with the content of the call for proposal and rules?
  - Access to information prior to call publication (CORDIS + NCPs + participants portal, programme committee, etc.)

	HOURS

  - Find the right information when the call is published

	HOURS

  - Understand the rules

	HOURS

  - Get additional information about the rules (CORDIS, NCP, EEN, REA, etc.)

	HOURS
Comments	

- How many hours did it take for you (your organisation) to develop the proposal?
  - Contents/technical agreement with partners (including DoW (Description of Work) and distribution of work packages/scientific and administrative tasks)

	HOURS

  - Ethical issues (if applicable)

	HOURS

  - Intellectual property issues (if applicable, in particular if industry onboard)

	HOURS

  - Gender issues (if applicable)

	HOURS

  - Security issues (if applicable)

	HOURS

  - External consultant / short term contractor time spent to develop proposals (if applicable)

	HOURS
Comments	

- How many hours did it take for you (your organisation) to
  - Submit the proposal with the Electronic Proposal Submission Service (EPSS) (coordinator only)?

	HOURS

  - Insert changes in the proposal with the Electronic Proposal Submission Service (EPSS) (coordinator only)?

	HOURS
Comments	

- In case your organisation participated in a hearing, how many hours did it take you (your organisation) to:
  - Prepare the hearing

	HOURS

  - Participate in the hearing

	HOURS
Comments	

Negotiation phase

- In case your organisation decided to submit a request for redress, how many hours did it take in total to go through the redress procedure?

	HOURS
Comments	

- How many hours did it take you (your organisation) to familiarise with the negotiation rules?
  - Access to information

	HOURS

  - Find the right information

	HOURS

  - Understand the evaluation summary report

	HOURS

  - Understand the negotiation mandate

	HOURS

  - Get support (from EC /REA "Administrative office", online Negotiation Facility, CORDIS, NCP, EEN, REA, etc.)

	HOURS
Comments	

- How many hours did it take you (your organisation) to develop the revised proposal (administrative/legal/financial/scientific) and how many iterations were needed?
  - Negotiate with partners

	HOURS		times

  - Negotiate within organisation (internal negotiation)

	HOURS		times

  - Negotiate with EC

	HOURS		times

  - Get support (from EC / REA "Administrative office", online Negotiation Facility, CORDIS, NCP, EEN, REA, etc.)

	HOURS		times
Comments			

- In case your organisation participated in negotiation meetings (internal – with consortium member), how many hours did it take you (your organisation) to:
  - Prepare the meeting

	HOURS

  - Participate in the meeting

	HOURS
Comments	

- In case your organisation participated in negotiation meetings (with the Commission), how many hours did it take you (your organisation) to:
  - Prepare the meeting

	HOURS

  - Participate in the meeting

	HOURS
Comments	

- How many hours did it take for you (your organisation) to
  - Submit the new version of the proposal with the electronic negotiation tool (coordinator only)?

	HOURS
Comments	

- How many hours did it take you (your organisation) to get the Grant Agreement signed?
  - Preparation of the agreement

	HOURS

  - Signature of the agreement

	HOURS
Comments	

- How many hours did it take you (your organisation) to prepare the Consortium agreement?
  - Preparation of the agreement

	HOURS

  - Signature of the agreement

	HOURS
Comments	

Project Management

- Contacts with Commission/perception of follow-up by Commission
  - How many contact people have you had at the Commission regarding your project since the project started?

	Past	Present	Comment
Project Officer			
Financial Officer			
Legal Officer			
Internal Auditor			
Any other			

  - How often do you contact the Commission?

	Ad-hoc (when report due or problem)	Once a month	Once a week
Project Officer			
Financial Officer			
Legal Officer			
Internal Auditor			
Any other			
Comments			

- How many hours did it take you (your organisation) to **familiarise with** the project management rules?
  - Access to information

	HOURS

  - Find the right information

	HOURS

  - Understand the reporting requirements (technical and financial)

	HOURS

  - Prepare the audit certificate for the methodology to calculate personal costs and/or indirect costs (if applicable)

	HOURS

  - Get support (from EC / REA "Administrative office", CORDIS, NCP, EEN, REA, etc.)

	HOURS
Comments	

- How many hours did it take you (your organisation) to **carry out** project execution, project management, reporting and closure (if applicable)?
  - Project factsheet (summary)

	HOURS

  - Project deliverables

	HOURS

  - Scientific/Technical reports

	HOURS

  - Financial statements including timesheets

	HOURS

  - Time to recruit relevant staff

	HOURS

- Audit certificate (only for those not certified)

	HOURS
Comments	

- How many hours did it take you (your organisation) to have your project reviewed by independent external expert(s) (if applicable) – (excluding reporting)?

	HOURS
Comments	

- How many hours did it take you (your organisation) to negotiate/ implement with the Commission the outcomes of the review by independent expert(s) (administrative/legal/financial/scientific):
  - Negotiate with partners

	HOURS		times

  - Negotiate with organisation (internal negotiation)

	HOURS		times

  - Negotiate with EC

	HOURS		times
Comments			

- How many hours did it take you (your organisation) to amend contracts
  - Negotiate with partners

	HOURS		times

  - Negotiate within organisation (internal negotiation)

	HOURS		times

  - Negotiate with EC

	HOURS		times
Comments			

- How many hours did it take you (your organisation) to deal with possible conflicts (with partners or EC) about project performance and their consequences in terms of:
  - Negotiation with partners

	HOURS		times

  - Negotiation with organisation (internal negotiation)

	HOURS		times

  - Negotiation with EC

	HOURS		times

Audits (if applicable)

- Is you project currently being audited (during project, after completion, by Court of Auditors)?

YES	NO
Comments	

- How many hours did it take you (your organisation) to familiarise with the audit rules?
  - Access to information

	HOURS

  - Find the right information

	HOURS

  - Understand audit requirements

	HOURS

  - Understand the financial report requirements

	HOURS

  - Get support (from EC / REA "Administrative office", CORDIS, NCP, EEN, REA, etc.)

	HOURS
Comments	

- How many hours did it take you (your organisation) to gather information for the audit?

	HOURS

Comments	

- How many hours did it take you (your organisation) to comply with the audit requests?

	HOURS
Comments	

- How many hours did it take you (your organisation) to complete the audit follow-up?

	HOURS
Comments	

Simplification measures

- Please describe the main problem(s) with the four project steps:

Project step	Problem(s)	Description(s)	Proposed solution(s)
Application			
Negotiation of contracts			
Project management			
Ex-post audits			

- Please compare your project with previous situation before simplification (if relevant)

Simplification theme	**Link with simplification objectives**[122]	**Quantify time saved (+/-25%, 50%, 75%)Related activities**	**Comments**
Funding schemes	Simple set of funding schemes		
	continuity with the instruments of FP6		
	flexibility of use		
Consistent, high-quality communication	user friendly documents		
	succinct publication in official journals		
	work programmes and call for proposals are adopted at the same time of the year		
Rationalisation of the requests for information addressed to the participants	web-based unique registration facility with the participant identification code		
	introduction of two stage procedures		
	extended period between reports from 12 to 18 months		
	no need for amendments for simple changes to the grant agreement and contract that the coordinator can validate		
	no need for audit certificate below EUR 375 000		
Reducing a-priori	guarantee fund for participants		

122 Based on SEC (2005) 431 « Simplification in the 7th FP » of 06.04.2005

Simplification theme	Link with simplification objectives[122]	Quantify time saved (+/-25%, 50%, 75%)Related activities	Comments
controls to a bare minimum (guaranteeing the protection of the Community's financial interest without imposing an undue burden on participants)	asking more than EUR 500 000		
Full operational autonomy entrusted to consortia	certification of the beneficiary on the method for calculating personal costs		
	certification of the beneficiary on the method for calculating indirect costs		
A more extended use of **flat-rate** financing within a simplified framework of forms taken by Community financial contributions	extended use of **flat-rate** financing		
	simplified framework of forms taken by Community financial contributions		
Removing the need for complex cost reporting models and clarifying definition of eligible costs	Simple cost reporting		
	Clearer definition of eligible costs		
Simplified support rates per type of activity			

- Please identify specific features of FP7 that you perceive as helping saving time (i.e. info days, participants portal, NCP, etc.):

- Please identify good practice examples (from international programme or other source) that could be used to simplify FP7:

Source	Programme/initiative	Description	Added value	Contact person – name	Contact person – email	Contact person – phone

- Other enriching experience (good practices from other projects, your simplification ideas, ...)

Questionnaire for Type II Case Studies

Date of the telephone interview	
Time	
Name organization:	
Interviewee(s)	
Role in the organisation (scientific, administrative, financial)	
Role in the project (coordinator, partner)	
Phone number	
Mobile phone	
Email	
Interviewer	
Comment(s)	

All information collected will be processed anonymously and presented in an aggregated way in the final report. This information will not be used for any other purpose than the study itself and will not be disclosed to third parties.

Introduction

Deloitte Consulting was mandated by European Commission, DG Research, to carry out an analysis of administrative simplification measures under FP7.

Deloitte will interview 90 project participants. The objectives of the interview will be to:

- Assess the time spent in FP7 project related activities from application to project closure/audit;
- Get interviewee's perception of simplification measures implemented so far and their suggestions for improvement in this area.

The Commission proposed a list of 60 ongoing or completed collaborative projects under the Cooperation programme. Deloitte contacted the project officers for these projects in order to know more about the project itself (background and status) and the project partners (roles, contact details). Based on these conversations with the Project Officers, Deloitte selected 30 projects for which the project coordinator and two project partners (priority will be given to work-package leaders) will be interviewed.

The success of the study assessing the effectiveness of simplification measures under FP7 and any resulting proposals for the reduction of the administrative costs related to the projects under FP7 or FP8 will be largely dependent on the quality of the data collected during this measurement phase.

The questionnaire below is addressed to organisations coordinating or having been involved in administrative activities (i.e. leading a work package or similar) in one of the 30 FP7 projects selected for the case studies.

In the organisation, the interviewee needs to be aware of the time spent in FP7 project related activities. Most of the time, the interviewee will be either the scientific coordinators in charge of the administrative management of the project for their organisation or the administrative coordinators of the project (or both).

This interview will be based on the Standard Cost Model (SCM) methodology. SCM aims to calculate administrative cost directly linked to 'Information Obligations'[123] (IOs), i.e. information citizens or businesses have to provide to comply with legislation. In the context of this study, SCM is used to estimate the time spent on activities directly linked to participation in a FP7 project (application, negotiation, project management and audit). The measurement unit is the hour (other units used during the interview will be converted into hours).

Overall, addressing these questions and engaging in the telephone interview should only take up a limited amount of your time (between 30 minutes and 1 hour).

Preliminary questions:

- Are you familiar with the IT tools supporting participants during the FP7 project lifecycle[124]?
    - Registration (URF)
    - Application (EPSS)
    - Negotiation (NEF)
    - Reporting (NEF, SESAM and FORCE)

  If **yes** (to at least one): please click here

  If **no**: please provide us with contact details of the person in your organisation that could answer questions related to the above.

  Target: Administrative officer, coordinator

- Are you in charge of financial reporting for your FP7 project(s)? Are you familiar with financial reporting in FP7 financial reporting rules?

  If **yes**: please click here

  If **no**: please provide us with contact details of the person in your organisation that could answer questions related to the above.

  Target: Financial or administrative officer, coordinator or project partner
  Population most at risk: SME/ big companies/ EU 10 Member States with accounting department encountering difficulties in understanding documentation and guidelines in English, new participants (avoid universities and research centers).

- Are you in direct contact with the Commission regarding:
    - Requests for project-related information?
    - Feedback related to periodic reporting?

  If **yes** (to at least one): please click here

123 Information Obligation is a term stemming from the Standard Cost Model framework which represents the standard methodology in Europe for measuring Administrative Burdens imposed on businesses. Information Obligations are the obligations arising from legislation to provide information and data to the public sector or third parties. An Information Obligation does not necessarily mean that information has to be transferred to the public authority, but may include a duty to have information available for inspection or supply on request. One piece of legislation may contain many Information Obligations.
124 These tools are grouped under the Participant Portal and not visible (anymore) during navigation (PADME)

If **no**: please provide us with contact details of the person in your organisation that could answer questions related to the above.

Target: Administrative or scientific officer, coordinator

- Have you been directly in contact with the Commission in the negotiation phase?

  If **yes** (to at least one): please click here

  If **no**: please provide us with contact details of the person in your organisation that could answer questions related to the above.

  Target: Administrative or scientific officer, coordinator or project partner

Questionnaire

IT tools within the Participants' portal

Quantitative questions

- Time spent using the IT tools within the participants' portal:
  - Registration (URF)
  - Application (EPSS)
  - Negotiation (NEF)
  - Reporting (NEF, SESAM and FORCE)

Questions	Registration (URF)	Application (EPSS)		Negotiation (NEF)		Reporting (SESAM, FORCE, NEF)	
		FP6	FP7	FP6	FP7	FP6	FP7
How long did it take to find the tool?							
How long did it take to register (ECAS) to get into the system (if required)?							
How long did it take to get familiar with the tool's requirements/understand what information is needed (Familiarising with the IO)?							
If relevant, how long did it take to train members and employees about the information obligations (IO)?							
If relevant, how long did it take to your own adjust existing data so that it fits the requirements of the form?							
If relevant, how long did it take to design new information material specifically to fill the form?							
If relevant, how long did it take to fill forms and tables?							
If relevant, how long did it take to hold meetings (internal and external)?							
How long did it take to submit the information?							

Qualitative questions

- User-friendliness of the tools (existing functionalities)

Questions (please rate 1-5, 5 being the most user-friendly)	Registration (URF)	Application (EPSS)		Negotiation (NEF)		Reporting (SESAM, FORCE, NEF)	
		FP6	FP7	FP6	FP7	FP6	FP7
Portal sophistication level (rating from 1-5) – see Annex 1							
- Comments							
Easy Access							
- Per project							
- Per profile within project (coordinator/partner)							
- Per organisation							
- Comments							
Portal functionalities							
- Self status check (opportunity to see state of play of your submitted documents and to update them online)							
- Status change notification (receive an email to notify that the status has changed)							
- Subscription to targeted news feeds (opportunity to receive news feeds or newsletters in accordance with profile)							
- Submission of information in an online form (vs. Word or pdf document upload only)							
- Download template in order to be prepare answers offline							
- Pre-filled forms							
- Pre-filled forms: Information re-used from a form to another within one system							
- Pre-filled forms: Information re-used from one system to another							
- Pre-filled forms: Information updates taken into account from a form to another within the same system							
- Pre-filled forms: Information updates taken into account from one system to another							
- Wrong data entry pop-up							
- Discussion forum							
- Save draft documents							
- Submission of draft documents for feedback (pre-application)							

Questions (please rate 1-5, 5 being the most user-friendly)	Registration (URF)	Application (EPSS)		Negotiation (NEF)		Reporting (SESAM, FORCE, NEF)	
		FP6	FP7	FP6	FP7	FP6	FP7
- Training (tutorials, webinars, videos, ...)							
- Comments + accessibility/retrievability of submitted information							
Portal support							
• Support services (**technical** questions)							
- By email							
- Via an online form							
- By phone							
• Support services (**content** questions)							
- By email							
- Via an online form							
- By phone							
• Relevant guidance documents							
• FAQ (Frequently Asked Questions)							
• Good practice examples							
- Comments							
Overall comments							
• User-friendliness							
• Administrative burden reduction opportunities							
• Irritation factor (0-5, 5 being very irritating)							

- Added value of new functionalities in terms of administrative burden reduction:

Questions (please rate 1-5, 5 being the most significant administrative burden reduction)	Registration (URF)	Application (EPSS)		Negotiation (NEF)		Reporting (SESAM, FORCE, NEF)	
		FP6	FP7	FP6	FP7	FP6	FP7

- Overall, would you use the following to qualify the IT tools within the participants' portal?

The IT tools under FP7...	Yes	Somewhat	No
Effectiveness (+)			
Room for improvement (+/-)			
Trust (+)			
Control (+/-)			
Burden (-)			
Security (+)			

- Overall comments (including the impact of familiarisation on future use) about the IT tools within the participants portal

Financial reporting

Quantitative questions

Activity	Working time	
	FP6	FP7
How long did it take to get familiar with the financial reporting requirements/understand what information is needed (Familiarising with the IO)?		
If relevant, how long did it take to train members and employees about the information obligations?		
How long did it take to retrieve relevant information from existing data?		
If relevant, how long did it take to your own adjust existing data so that it fits the requirements of the form?		
If relevant, how long did it take to design new information material specifically to fill the form?		
If relevant, how long did it take to modify pre-filled data in the EU IT tool?		
If relevant, how long did it take to design new information material?		
How long did it take to fill forms and tables?		
If relevant, how long did it take to hold meetings (internal and external)?		
How long did it take to submit the information?		

Qualitative questions

- Overall questions

Financial reporting	Current status	Desirable change	Comments
Administrative burden reduction opportunities[125]			
• certification of the beneficiary on the method for calculating personal costs			
• certification of the beneficiary on the method for calculating indirect costs			
• flat-rate financing			
• cost reporting form			
• cost eligibility			
• support rate per type of activity			
• support rate per type of organisation			
• pre-defined lump sums (high trust "award" approach)[126]			
• Other comments			
Overall user-friendliness			
Irritation factor (0-5, 5 being very irritating)			
• Complex rules			
• Changed rules compared to FP6			
• Changing rules			
• Conflicting interpretation			
• Application more strict than the rule itself			

- Please fill in the table below with information (report periodicity) about the financial reporting requirements your organisation deals with at different levels (project, organisation, national, etc.):

Reporting period	Current	Desirable	Comments
Project level - External (Coordinator's financial reporting to EC)			
Project level - Internal (Partners reporting to coordinator)			
National level (Participant reporting to national authorities)			
Organisation level (Participant reporting to their organisation)			

- Please use the table below to identify where incompatibility or conflicts among different sets of financial rules arise:

Financial rules	EU level	National level	Organisation level	Project level	Auditors
EU level					
National level					
Organisation level					
Project level					
Auditors					

- Overall, would you use the following words to qualify the financial reporting in FP7?

The financial reporting under FP7...	Yes	Somewhat	No
Effectiveness (+)			
Room for improvement (+/-)			
Trust (+)			

125 Please see definitions used in Communication "Simplifying The Implementation Of The Research Framework Programmes" COM(2010) 187, 29 April 2010

126 Please see definitions used in Communication "Simplifying The Implementation Of The Research Framework Programmes" COM(2010) 187, 29 April 2010

The financial reporting under FP7...	Yes	Somewhat	No
Control (+/-)			
Burden (-)			
Security (+)			

- Overall comments (including the impact of familiarisation on future use) about the financial reporting in FP7

Timeliness and quality of information

Quantitative questions

- How long did you have to wait between the proposal deadline and the signature of the grant agreement (time to grant[127])

Activity	**Actual time** (compared to previous activity)	**Desired time** (compared to previous activity)
Acknowledgement of receipt for the proposal (first stage or single stage)		
Feedback about first stage or single stage proposal		
Acknowledgement of receipt for the proposal (second stage – if relevant)		
Feedback about second stage proposal – if relevant		
Invitation to negotiate (negotiation mandate)		
Invitation to negotiation meeting – if relevant		
Feedback from negotiation		
Signature of the grant agreement by EC)		

- How long did you have to wait to get a reply in the following project life-cycle stages (time to reply):

Activity	Acknowledgement of receipt	First element of reply	Satisfactory reply	
			Actual	Desired
Proposal stage				
• URF				
• EPSS				
Negotiation stage				
• NEF				
• Commission (please specify)				
PM stage				
• NEF/SESAM/FORCE				
o Financial reporting				
o Technical reporting				
o Amendments				
• Commission (please specify)				
o Financial reporting				
o Technical reporting				
o Amendments				
Audit stage				

127 Time to grant is the interval between the deadline for bidding for funding in response to a call for proposals and the signature of a grant agreement

128 Time to reply is the interval between the submission of a question to the Commission and the reply from the Commission, including:

- Acknowledgement of receipt
- First element of reply (partial reply, forward to another contact, unsatisfactory reply, etc.)
- Satisfactory reply: reply that the applicant/participant accept as final answer

Activity	Acknowledgement of receipt	First element of reply	Satisfactory reply	
			Actual	Desired
• Commission (please specify)				
• Auditors				

- How long did you have to wait in to receive EU co-funding (time to pay[129])? Please do not take into account delays due to consortium management

Activity	Actual time	Desired time
Pre-financing payment		
Interim payment		
• Report approved		
• Payment received		
Final payment		
• Report approved		
• Payment received		

Qualitative questions

- Please use the table below to identify where incompatibility or conflicts among different set of rules arise (excluding financial rules):

Financial rules	EU level	National level	Organisation level	Project level	Comments
EU level					
National level					
Organisation level					
Project level					
Comments					

- Please specify the kind of incompatibilities or conflicts and their impact on your project:

- Overall, would you use the following words to qualify the timeliness and consistency of information in FP7?

Timeliness and consistency under FP7...	Yes	Somewhat	No
Effectiveness (+)			
Room for improvement (+/-)			
Trust (+)			
Control (+/-)			
Burden (-)			
Security (+)			

- Overall comments (including the impact of familiarisation on future use) about the timeliness and consistency of information in FP7

Negotiation Phase

Quantitative questions

Activity	FP6			FP7		
	Scientific negotiation	Administrative negotiation	Number of iterations	Scientific negotiation	Administrative negotiation	Number of iterations
How long did it take you						

129 Time to pay is the interval between submission of a cost claim (accompanied by a report) and the actual payment to the beneficiaries.

Activity	FP6			FP7		
	Scientific negotiation	Administrative negotiation	Number of iterations	Scientific negotiation	Administrative negotiation	Number of iterations
(your organisation) to familiarise with the negotiation rules?						
• Access to information						
• Find the right information						
• Understand the evaluation summary report						
• Understand the negotiation mandate						
• Other comments						
How many hours did it take you (your organisation) to develop the DoW (Description of Work) and the budget distribution including the GPF (Grant Preparation Forms)?						
• Administrative						
• Legal						
• Financial						
• Scientific						
In case your organisation participated in negotiation meetings (internal – with consortium members), how long did it take you (your organisation) to:						
• Prepare the meeting ?						
• Participate in the meeting?						
In case your organisation participated in negotiation meetings (with the Commission), how long did it take you (your organisation)?						
• Prepare the meeting ?						
• Participate in the						

Activity	FP6			FP7		
	Scientific negotiation	Administrative negotiation	Number of iterations	Scientific negotiation	Administrative negotiation	Number of iterations
meeting?						

Qualitative questions

Financial reporting	Current status	Desirable change	Comments
Administrative burden reduction opportunities			
• Reduced number of iterations			
• Meeting(s) in Brussels			
• Other?			
Overall user-friendliness			
Irritation factor (0-5, 5 being very irritating)			
• Complexity of the negotiation rules			
• Changed rules compared to FP6			
• Changing rules			
• Conflicting interpretation			
• Application more strict than the rule itself			

- Do think the negotiation phase could be simpler?
- What would you suggest to streamline the negotiation phase?
- Could you propose any good practice?
- Do you think the grant agreement model used for funding basic research (see for example the European Research Council) is applicable?
  The negotiation phase will only look at administrative information and management information (if needed). Reference: page 45 of the "ERC Grant Schemes Guide for Applicants for the Advanced Grant 2011 Call" version 11/11/2010. "The grant preparation involves no negotiation of scientific/technical substance. Applicant legal entities and Principal Investigators are expected to provide, if requested, further information on the project and its envisaged management in view of the rules applicable to ERC grants and if needed on the legal and financial capacity of the legal applicant entity."
- Overall, would you use the following words to qualify the negotiation phase?

The negotiation phase in FP7...	Yes	Somewhat	No
Effectiveness (+)			
Room for improvement (+/-)			
Trust (+)			
Control (+/-)			
Burden (-)			
Security (+)			

- Overall comments (including the impact of familiarisation on future use) about the negotiation phase

Annex: Sophistication level

Sophistication level	Description	Underlying functionalities
Level 1 – Provide info about the IO	Basic information provided to beneficiaries; passive website where information can be read	L1.1: Support: general information, guidelines and/or a F.A.Q; L1.2: E-learning and tutorials.
Level 2 – Downloadable IO forms	One-way interaction for beneficiaries to fill in information; downloadable forms on the website	L2.1: Downloadable forms.
Level 3 – IO submission	Two-way interaction (electronic forms that allow two-way information exchange, i.e.	L3.1: Forms can be electronically submitted; L3.2: Provide ALL requested information

	information can be uploaded into the system as well)	through the portal; L3.3: Avoiding for information submitted electronically, to having to resubmit it on paper; L3.4: Automatic system to exchange between the Beneficiary and the Managing Authority; L3.5: electronic authentication; L3.6: Allowing attachment and submission of relevant documents in electronic format.
Level 4 – IO status monitoring	'Full' electronic handling (e.g. self status follow-up)	L4.1: Email support.
Level 5 – IO workflow automation	Personalisation: pro-active and automatic handling (e.g. pre-filled forms, deadlines, alarms, etc.)	L5.1: Submitting information continuously, at the point in time of occurrence. E.g. sending invoices when they are processed; L5.2: Personalised forms (pre-filled forms).

Source: European Commission, 2009 benchmark study performed by CapGemini, Rand Europe, IDC, Sogeti and DTi for the European Commission, DG Information Society and Media on European eGovernment services.

Questionnaire international organisations

Date of the interview	
Time	
Name organization	
Website	
Interviewee(s)	
Role in the organisation	
Phone number	
Mobile phone	
Email	
Other recommended contact	
Comment(s)	
Interviewer	

Introduction

Background of the study

Deloitte Consulting is mandated by the European Commission, DG Research, to carry out an analysis of administrative simplification measures under the Seventh Framework Program (FP7).

As part of this exercise, Deloitte was asked to carry out a study analysing implementation and simplification issues for three major national or international research funding programmes, one of them being your organisation.

Our objective is to assess how "simple" and "user-friendly" FP7 is in relation to other large research programs and to assess whether there are different approaches which could deliver better results.

Definitions

Simplification

For the purpose of this interview, **simplification** should be understood as defined in the Commission Staff Working Document "Simplification in the 7th framework programme"[130]:

- Flexibility - providing the necessary tools to achieve FP7 objectives efficiently;
- Rationalisation - establishing a better balance between risks and controls, avoiding procedures, rules and requests that have no added value, and aiming for the reduction of delays;
- Coherence - clarifying rights and obligations, ensuring consistent and user-friendly communication, matching objectives and means, and taking into account participants' own practices and pre-existing rules as far as possible.

Simplification measures under this definition are described in the Communication on simplifying the implementation of the research framework programmes[131].

130 SEC(2005) 431 of 6 April 2005
http://cordis.europa.eu/documents/documentlibrary/72661501EN6.pdf
131 COM(2010) 187 of 29 April 2010
http://ec.europa.eu/research/fp7/pdf/communication_on_simplification_2010_en.pdf

FP7 Project life-cycle

The life cycle of an FP7 project can be described as follows:

Project life cycle phase	Steps included
Selection of proposals	• The preparation and definition of the annual work programmes • The planning and coordination of the calls • The evaluation of proposals received • The related work carried out until the final list of approved proposals has been signed
Negotiation of contracts	• All tasks performed during the detailed negotiation of the selected proposals, until the projects' draft contracts are sent in batches and a Commission decision is returned. The stages covers all controls until the favourable decision is obtained
Project Management	• The expenditure financial operations defined in the financial regulation, i.e. the establishment of the Commission's individual and legal commitments in the form of a signed grant agreement, • The financial management (pre-financing, intermediate and final payment) • All the scientific work necessary to the approval of the non financial deliverables required to clear the payments
Ex-post audits	• The work of the ex-post audit units • Some work required from the operational units in terms of putting together documentation for selected projects, in preparation of the audits • Work done on contradictory procedures with the beneficiaries, until the audit results are finalised • The time spent dealing with forecasts of revenue, recovery orders, extrapolation, exchange of correspondence and contacts with the beneficiaries to deal with these issues

General questions regarding your programme

Type of Programme and funding model

- Please describe the type of funding programme and funding model your organization is managing:
  - Basic research funded by grants or scientific prizes (European Research Council type)
  - Applied research funded by cooperative agreements (Framework Programme type)
  - Mix of both

General data for each type of research

- Please provide the broad numbers for each type of research your organization is managing:

	Budget	Number of proposals	Number of grants	Number of participants	Number of payments
For comparison: EC (FP7) in 2013[132]	€ 10 billion	30 000	6 000	36 000	10 000
Basic research					
Applied research					

132 Source : mid-term review of FP7

Total					

Applied research Programme management (basic if no applied programme)

- Please describe how your programme is managed and detail the main components of the project life-cycle:
  - Selection of proposals
  - Negotiation of contracts
  - Project Management
  - Ex-post audits

Policy to promote quality

- Please describe any policy to promote quality your organization is adopting:
  - ISO certification
  - Other certification
  - National (or EU) quality charter
  - Other
- Are there ongoing / finalised internal quality projects?
- Do you have quality procedures in place?
- Do you have quality control?
- Do you measure quality? And if so, how?

Collaboration with other EU funding programme (not for NSF)

- Please describe any collaboration with other EU funding programme your organisation is adopting:
  - Participation in the "EU joint programming" initiative[133] or similar
  - Recognition of ERC evaluation
  - Other collaboration with Member States leading to harmonisation or joint initiative
  - Other

Simplification

simplification measures

- Did you study / quantify the administrative burden / irritation for applicants that is related to your programme?
- What simplification measures have been undertaken over the last years, related to the following project phases:
  - Selection of proposals
  - Negotiation of contracts
  - Project Management
  - Ex-post audits
- Do you have ideas for future simplification measures?

Drivers of simplification

- What has driven the simplification efforts?
  - EU competition
  - EU collaboration
  - Participants to programmes (irritation, complaints, ...)
  - Others

Process of simplification

133 See http://ec.europa.eu/research/era/areas/programming/joint_programming_en.htm

- How is the simplification process being monitored within the funding programme?
    - External review
    - Internal review
    - As part of a continuous improvement process
    - Others

Managing the implementation

- Which measures have been fully implemented, which are ongoing?
- How have the simplification measures been implemented within the funding programme?
    - External implementation (using an external contractor)
    - Internal implementation
    - Others
- Where these measures successful or unsuccessful?

lessons learned

- What lessons can be drawn from your experience with simplification initiatives?
- What good practices in terms of managing the simplification process can be identified?
- What are the barriers, risks, challenges related to the simplification process?
- What problems, issues have been encountered during the implementation of the simplification measures and have they been overcome?

Effectiveness and impact of the simplification measures implemented

- What is your perception of the effectiveness and impact of the simplification measures implemented for the participants in terms of:
    - Availability of information;
    - Transparency of information and procedures;
    - Complexity of the processes to be implemented by the applicants/users;
    - Systematic and efficient reuse of available data;
    - User-friendliness and quality of the supporting systems and instruments;
    - Clarity on roles and responsibilities;
    - Support offered by the managing services during the process;
    - Quality of the services delivered by the managing services.
    - Other
- Have you carried out any monitoring and evaluation / measurement exercise to assess the effectiveness of the simplification measures in your organization/under your programme? And how? If so, is it possible for us to access the data and/or evaluation report(s)?

Simplification in FP7

This section requires that the interviewee knows FP7 and FP7 simplification background.

- Do you identify any problem(s) within the four project steps in FP7?
    - Selection of proposals
    - Negotiation of contracts
    - Project Management
    - Ex-post audits
    - Transversal issues
- Do you have any suggestions for further simplification in FP7?
    - Selection of proposals
    - Negotiation of contracts

- Project Management
- Ex-post audits
- Transversal issues

- Could you recommend any good practice example to inspire further FP7 simplification (international, national, or regional)?

Programme/initiative	Description	Added value	Contact person – name, phone, email

ANNEX 3 - FUTURE PARTICIPANTS GUARANTEE FUNDS AND EX-ANTE CONTROLS OF THE FINANCIAL VIABILITY

Future Participants Guarantee Funds and ex-ante controls of the financial viability

1. Duplication of the FP7 Participants Guarantee Funds onto the CSF

1.1. State of Play

The FP7 EC and EURATOM Participants Guarantee Funds (PGF) have proven to date to adequately live up to the expectations set in their mission. Their mission consists in the protection of the EU budget against financial losses caused by bankruptcies and comparable deficiencies of beneficiaries on the one hand. On the other hand, the PGF protect the financial interests of grant beneficiaries, allowing projects to continue by reimbursing to consortia amounts lost to bankruptcy and comparable deficiencies of one of their members.

By 31 March 2011, the contributions to the PGF were in excess of 931 million euros. The EIB's investments of these assets had yielded net 32.7 million euros as interest. To date, 25 interventions of the PGF following bankruptcies and liquidations of beneficiaries have cost 2.5 million euros. At 31 March 2011, after deduction of costs and fees, 28.4 million euros remained available for future interventions.

The projections of the financial evolution of the PGF suggest that the intervention capital (interest) generated will well match the intervention needs. The EIB expects an average interest rate on its investments of 1.5% over the life time of the PGF, amounting to some 185 million euros. The intervention needs throughout FP7 have been estimated at an amount of between 130 and 150 million euros.

The positive experiences made with the PGF until now fully justify the recommendation to duplicate this financial instrument onto the CSF.

Apart from the benefits of the PGF's principal mission it must be borne in mind that the existence of this instrument has positive secondary side effects.

The PGF allow decreasing the intensity of ex ante controls of the financial viability of project participants (see also point 3 below). SMEs in particular find easier access to successful project consortia.

On the other hand, the PGF make the Commission's former requests for the submission of bank guarantees obsolete. The positive financial effects for those participants who would have had to present such a guarantee are obvious: They preserve their credit margin and must not pay bank fees, which is of considerable benefit for SMEs in particular. For illustration purposes: In the period from 2002 to

2006, the Commission had received 560 bank guarantees for a total financial volume of more than 160 million euros.

1.2. Scope and administrative/accounting setup of a CSF PGF

Instruments such as JTI, etc. cannot participate in the FP7 PGF as they are not subject to the FP7 Rules of Participation. Possible alternatives have been explored with certain JTI, but to no avail. However, as the activities of these instruments are and will be financed by the EU to a large extent and as the nature and structure of the participants to these instruments is largely congruent with the participant population in traditional FP7 actions, it seems appropriate to include these instruments as well as Art. 185 Initiatives, CIP and EIT in the CSF PGF in order to ensure the same protection level for the participants benefiting from grants in those instruments and the EU budget just as in all other activities under the CSF.

The financial risk of extending the CSF PGF to the instruments mentioned above cannot be quantified at this point in time since it will depend on the apportionment of budget to the different funding schemes under the CSF, specifically concerning the funding schemes for SMEs. However, as the population of participants in the instruments in question does not represent major differences to the population of traditional research project participants, the increase of the financial risk should be minimal and covered by the additional contributions received from the instruments.

The financial and accounting infrastructure including the ABAC interface of the FP7 PGF may as such be duplicated to the CSF PGF. However, DG Budget will have to examine to which extent the infrastructure needs to be adapted to the extended circle of participants in the CSF PGF.

The administrative costs of this exercise are not quantifiable at this point in time. The investment in human resources on the side of DG Budget will however not be negligible.

The legislation on the FP7 PGF only foresees to entrust the financial management of the PGF either to the European Investment Bank or to another appropriate financial institution as depository bank. It is recommended to broaden notion of depository bank in order to explore suitable alternatives for the CSF PGF.

Lastly, it should be examined to propose that the net operating surplus of the CSF PGF at the end of its operations should not return to the EU budget, but, if possible, be made directly available to future EU RTD programmes.

2. Analysis of the impact of a reduction of ex ante controls of the financial viability (FVC) on the CSF PGF

As mentioned above, the intervention needs of the PGF throughout FP7 had been estimated at an amount of between 130 and 150 million.

At the end of 2013, which marks the end of FP7, the assets of the PGF should attain 1.7 billion euros. The assets will from then on melt down to zero by the end of 2021[1]. As mentioned above, the assets will generate a total of some 185 million euros in interest.

On the basis of data extracted from CORDA as per 7 April 2011, 10,598 grant agreements have so far been financed under FP7 for a total EU budget of around 25 billion euros.

1,599 distinct coordinators (excluding public bodies and universities) have been checked for their financial viability[2] to date.

Of the beneficiaries not being coordinators having requested an EU contribution of 500,000 euros and more, 1,378 (being private entities without public guarantees) have been checked for their financial viability to date.

As per 30 April 2011, it is possible to state that the extent of ex ante controls of the financial viability of coordinators and large beneficiaries has been fully justified:

- Of the 25 interventions concerning 17 different beneficiaries only 2 beneficiaries were coordinators. One of these went bankrupt immediately after the start of the project and took the entire prefinancing with him.
- The remaining 23 interventions concerning 15 different beneficiaries were limited to amounts of between 3,000 and 241,000 euros. None of the beneficiaries concerned had requested a contribution of 500,000 euros or more and were consequently not checked for their financial viability.

These circumstances suggest in principle continuing such checks in the CSF. The ex-ante check of the financial viability of private body coordinators enhances the security for the Commission that the prefinancing paid to coordinators will correctly be paid on to the other beneficiaries (annex 3, option 1).
It is nevertheless recommended to assess the financial exposure of the EU "vis-à-vis" any beneficiary by calculating its total EU contribution for all on-going and new projects, and to proceed with systematic FVC for cumulative EU contributions in excess of 500,000 euros. This would only affect marginally the current number of validations, but would increase tremendously the robustness of FVC for the smaller beneficiaries, participating in many small contracts.

Other options however are conceivable.

Another option (annex 3, option 2) could be to check the financial viability of coordinators as well as for beneficiaries requesting a cumulative EU contribution in excess of 1,000,000 euros.. In the reference period up until 30 April 2011, such an increase would have spared an additional 35% of financial viability checks compared to option 1. Taking a maximum risk of a 4,5% loss as suggested by detailed financial analysis of a representative portfolio of projects and a maximum materialisation level of 50%, the modification proposed represents an additional financial risk for

[1] NB! The end of all financial transactions in relation to the FP7 PGF is expected a number of years later (last waiver or cashing of the last recovery order of the PGF).
[2] For all background data please refer to annex 1.

interventions of the PGF that could be covered in maintaining the current contribution level of 5%.

A further option is to modify the payment scheme to the individual projects to yield a further decrease of financial viability checks (annex 3, option 3). Instead of making the pre-financing, intermediate and final payments to the coordinators, it can be envisaged to make those payments individually to each beneficiary. The technical set-up of ABAC makes this feasible by regrouping several payment requests under one single payment order, but this option needs a more integrated IT support.

Apart from the benefit of easier traceability of payments and their recovery, individual payments to beneficiaries offer the advantage of eliminating coordinators as cash buffers and therefore excluding the financial risk associated with this role. In consequence, coordinators – just as other ordinary beneficiaries - would only have to be controlled for their financial viability if they request a cumulative EU contribution in excess of 1,000,000 euros.

As under these circumstances, and extrapolating results up to the end of FP7, only 1,734 beneficiaries and coordinators in total would be subject to a financial viability check – 73% less than under the scheme in force –, the administrative burden would decrease considerably for all parties involved, including coordinators that would no longer distribute payments within the consortium.

The larger the requested EU contribution becomes, the more their requesting beneficiaries will be large and very large organisations that intrinsically represent a much lesser – if non-existing – financial risk for the EC. Under the FP7 PGF, all interventions were made for small and very small defaulting participants that had had requested EU contributions already exempt from financial viability checks under the present rules.

This circumstance, together with the relatively small quantity of beneficiaries and in conjunction with the fact that financial viability checks do not always render fully reliable results, make it worthwhile to consider the most far reaching option that is the abandon of financial viability checks altogether (annex 3, option 4). This option requests as well direct payments to all beneficiaries in the consortium.

Both options 3 and 4 may increase the risk exposure to amounts that could no longer be covered by a contribution percentage of 5%, but would have to be increased to a quota of between 5% and 7,5%.

In consequence, if option 3 or 4 were to be chosen for the CSF PGF, it is proposed to draft the future legislation foreseeing a maximum contribution rate of 7.5% with the aim to gain the necessary flexibility, although it can be anticipated that the very high level of risk materialization (50%) used in all simulations is unlikely to be reached and that therefore this margin of manoeuvre should not be exhausted.

Largely decreased or abolished financial capacity checks should be replaced by the control of beneficiaries' operational and co-financing capacity, i.e. their overall capacity to perform the work to which they subscribe in the work programme. Such checks could be facilitated by the future existence of a common inter-DG back office,

in which the results of such checks could be compiled, accessed, exchanged, and updated.

3. Conclusions

This paper proposes the **duplication** of the FP7 Participants Guarantee Funds onto the CSF, since they have proven to adequately live up to the expectations set in their mission, and to extend its coverage to the participants benefiting from grants in all instruments of the CSF.

The legislation on the FP7 PGF only foresees to entrust the **financial management** of the PGF either to the European Investment Bank or to another appropriate financial institution as depository bank. It is recommended to broaden the notion of depository bank in order to explore suitable alternatives for the CSF PGF.

Lastly, it should be examined to propose that the net **operating surplus** of the CSF PGF at the end of its operations should not return to the EU budget, but, if possible, be made directly available to future Guarantee Fund schemes.

Of course the performance of the PGF strongly depends on the ex-ante controls of the **financial viability checks** (FVC) of the participants.

This paper proposes 4 options with regard to FVC that will be carried out depending on the cumulative EU contribution to beneficiaries:

- **Option 1** is "**business as usual**" without major changes to the current setup. With the view to improve the robustness of FVC "vis-à-vis" smaller beneficiaries, it is recommended to assess the financial exposure to any beneficiary by calculating its total EU contribution for all on-going and new projects.

- **Option 2** allows **reducing FVC by 35%** with an increase of the threshold for the FVC of participants in projects to 1,000,000 euros[3]. In this case, coordinators continue to distribute payment and remain thus fully submitted to FVC

- **Option 3** enables **saving 73% of FVC** by increasing the validation threshold for coordinators and participants to 1,000,000 euros. In this case, the administrative burden of coordinators will be reduced, since they will no longer distribute payments to the other members in the consortium and will improve the service to participants in the CSF. This option will not entail more payment orders to be prepared and validated, but more bank account files to be validated. This additional clerical work that is quite straight forward will be balanced by the expected improvement with regard to income management.

- **Option 4** proposes to **abandon the current FVC** since the larger the requested EU cumulative contribution becomes, the more their requesting

[3] Inflation not taken into account

beneficiaries will be large and very large organisations that intrinsically represent a much lesser – if non-existing – financial risk for the EC.

Both options 3 and 4 may increase the risk exposure to amounts that could no longer be covered by a contribution percentage of 5%, but would have to be increased to a quota of between 5% and 7,5%.

In consequence, if option 3 or 4 were to be chosen for the CSF PGF, it is proposed to draft the future legislation foreseeing a maximum contribution rate of 7.5% with the aim to gain the necessary flexibility, although it can be anticipated that the very high level of risk materialization (50%) used in all simulations is unlikely to be reached and that therefore this margin of manoeuvre will not be used.

Largely decreased or abolished financial capacity checks should be replaced by the control of beneficiaries' operational and co-financing capacity, i.e. their overall capacity to perform the work to which they subscribe in the work programme. Such checks could be facilitated by the future existence of a common inter-DG back office, in which the results of such checks could be compiled, accessed, exchanged, and updated.

In any case, all these processes need to be fully supported by the adequate IT tools.

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ANNEX

OPTION 1

FVC REMAINS UNCHANGED FOR COORDINATORS AND LARGE BENEFICIARIES

- All coordinators remain subject to FCV
- Beneficiaries requesting a contribution >€ 500,000 remain subject to FCV

PROS: - Gives highest assurance on PGF risk coverage in relation to existing data
- No impact on existing structures of PGF

CONS: - No decrease of administrative burden for beneficiaries and EC services

Impact on PGF - None

OPTION 2

INCREASE OF THRESHOLD FOR FVC FROM €500,000€ TO €1,000,000 - COORDINATORS REMAIN PAYMENT RECIPIENTS FOR THE CONSORTIUM

- Coordinators continue receiving payments and distributing to their partners (beneficiaries)
- FVC for all coordinators needs to be maintained

PROS: - Less FVC (-35%)

CONS: - Imbalance between coordinators and participants with regard to FVC

Impact on PGF - Under the assumption of 4.5% of the total budget being at risk and a level of materialisation of 50%, there is no need to increase the 5% contribution to the PGF

N.B. The decrease of FCV should be mitigated by increased checks of the co-financing capability and operational capacity, and this in unified form for all grant participations at central level.

Percentage of risky beneficiaries (SMEs) decreases with increasing FCV threshold.

OPTION 3

INCREASE OF THRESHOLD FOR FVC FROM €500,000€ TO €1,000,000 FOR ALL BENEFICIARIES AND DIRECT PAYMENTS

- Coordinators will no longer be recipients and distributors of EU contribution, but contributions will be paid to beneficiaries individually, according to a breakdown provided by the coordinator.
- Significant decrease of financial risk at the level of coordinators.
- Less sense to maintain FVC with increased threshold since percentage of risky participants decreases

PROS:
- Less FVC (-73%)
- Less administrative work for coordinators
- No retention of cash by coordinators
- Payment date ("date de bonne valeur") and amount known for each participant
- No involvement of coordinators in recovery procedures that do not concern them directly

CONS:
- More BAF (bank account files) to be created and managed
- Same amount of Payment Orders containing more Payment Requests
- More transactions managing the PGF

Impact on PGF
- Under the assumption of 4.5% of the total budget being at risk and a level of materialisation of 50%, an increase of contribution to between 5% and 7.5% is necessary.

N.B. This option requires a full IT support. That allows automatic generation of Payments Orders (PO) and Payment Requests (PR) for each member of the consortia.

OPTION 4

NO FVC FOR ANY OF THE PARTICIPANTS

- Full acceptance of all risks relating to financial viability

PROS:
- Significant decrease in administrative burden for EC services

CONS:
- Radical change in the approach accompanied by loss of feedback on the financial standing of the participants

Impact on PGF
- As there is no measurable impact on risk exposure in this option, and under the assumption of 4.5% of the total budget being at risk and a

level of materialisation of 50%, an increase of contribution to between 5% and 7.5% is necessary.

N.B. The abandon of FCV should be mitigated by increased checks of the co-financing capability and operational capacity, and this in unified form for all grant participations at central level.

ANNEX 4 - ANALYSIS OF GREEN PAPER CONSULTATION

Analysis of Green Paper consultation

Q1. How should the Common Strategic Framework make EU research and innovation funding more attractive and easy to access for participants? What is needed in addition to a single entry point with common IT tools, a one stop shop for support, a streamlined set of funding instruments covering the full innovation chain and further steps towards administrative simplification?

Main messages

- Strong support for all simplification measures proposed in the Green Paper.
- Widespread view that calls need to be less prescriptive and the evaluation more transparent, with "excellence" as the main criteria. In that line, researcher-driven schemes (as ERC) based on excellence should be promoted.
- Projects need to allow for smaller consortia and be more flexible during the implementation.
- Many suggestions to reduce paper work at all stages: pre-application (shorter, clearer guidance), application stage (including through 2 stage process), grant agreements (avoid micromanagement), and reporting.
- Requests for significantly improved IT portal – more user-friendly, more functionalities, etc.
- Improve communication and support to potential applicants including promoting networking for creation of new consortia and participation of newcomers.
- Reduce the number of instruments, removing overlapping, and improve coordination with other EU funds (eg. Structural Funds) and national funds.

Specific points

- Many requests for more open, flexible topics and for more small projects (fewer participants) with simpler rules and procedures.
- Support for single EU portal, and several requests for better IT systems, more user-friendly, easy access to previous projects and results, intelligent support to find partners, alert service for new calls.
- Support for uniform rules across all activities and reduction of funding schemes avoiding duplicities.
- Many suggestions for clearer communication e.g. exec summaries of calls; shorter, clearer guidance (including on-line guidelines); more training especially at the beginning of a new programme and better support for applicants also at national/regional level. Less EU jargon.
- Strong support for 2 stage calls with much shorter application forms, and higher success rates in the second stage (large oversubscription is perceived as a waste of resources).Some suggestions for continuously open/ rolling calls.
- Several requests for faster evaluations and faster time to contract and time to payment; overall, time elapsed from the publication of the call to the start of the project is perceived as too long.
- Many requests for less prescriptive grant agreements, with fewer milestones, deadlines, deliverables etc. Calls for more trust-based funding.
- Regarding financial rules, continuity of the cost-reimbursement logic is preferred to a radical change toward output-based grants. The message is clearer in the position papers than in the on-line replies where opinions are less homogeneous.
- Several request for lower reporting burdens, less frequent, less detailed.
- Several requests for more attention and accountability for project results, open-access and more visibility of EU funded projects.
- Some suggestions to follow national practices more closely and/or promote harmonisation of rules.

- Several respondents complain that expensive consultants are needed to prepare proposals likely to succeed. In general, more transparency is asked for the evaluation.
- Some concerns that "insider knowledge"/ contacts are needed to get funding.
- Promote participation of industry to boost innovation and market results.
- Continuity of successful programmes.
- Strengthen the National Contact Points network to promote access to the grants and to support participants.

Q6. How could the Commission ensure the balance between a unique set of rules allowing for radical simplification and the necessity to keep a certain degree of flexibility and diversity to achieve objectives of different instruments, and respond to the needs of different beneficiaries, in particular SMEs?

Main messages

- More flexibility is needed:
  - *More flexible rules including flexibility for project implementation; allow for adaptability of the research work.*
  - *Open, or at least wider, calls with flexible evaluation principles based on "excellence".*
- Unique and simpler (but flexible) set of rules:
  - *General perception is that simpler rules mean also more flexible rules. The concept of "unique set of rules" is however not equally understood by all beneficiaries; in most cases the "unique set of rules" include calls for "options" for the beneficiaries (like flat-rates or actual costs) or dedicated rules/reimbursement rates for specific groups of beneficiaries or type of research (fundamental /applied).*
  - *A unique set of rules should not lead to a one-size-fits-all situation.*
  - *Homogeneous interpretation of the rules.*
  - *Where possible fewer instruments.*
- Fewer and simpler reporting requirements:
  - *Fewer reports to be submitted, less information to be provided in the reports, some voices against the request for time-sheets.*
- Further promotion of SMEs participation:
  - *Via dedicated instruments and schemes or by setting a set of rules specific for SMEs with faster procedures and less onerous applications.*

Specific points

- Several calls for a more trust-based approach. Funds granted on proved expertise, past results, excellence, etc. Some views favourable to controls based on output not on input (output-based grants).
- Simpler procedures for submission of proposals and a more transparent (and flexible) evaluation process. Heavy requirements for proposal preparation act as an entry-barrier for new participants, especially SMEs.
- Several requests for the use of two-stage calls. In general, better communication of the calls among stakeholders is demanded.
- Allow for smaller projects with fewer participants and ad-hoc simplified rules and procedures.
- Project implementation should be more flexible which may need redefining the personal liability of Commission officers.
- Certain respondents call for a reduction of the audit controls, trusting national audit systems or internal controls of the entity and accepting the usual accounting practices.
- Certain beneficiaries warn the Commission about the risk of abuse behind too simple rules and/or too little control (attention to the "professional grant seekers").
- Remove EU jargon, make rules understandable for researchers.

- More assistance and one-to-one guidance by the Commission, NCPs and/or national services. In addition, dedicated support for SMEs on IPR related issues.
- Harmonised implementation within the Commission and, where possible, integration between EU programmes and national programmes.
- Some suggestions for the Commission to carry out benchmark analysis on national or international research programmes.
- Granting funds for the whole cycle of research (from the idea to the market) for further promoting participation of industry and SMEs. Support innovation to attract participation from private sector.
- Other requests: easier amendment procedures, granting funds also for project preparation and/or subsequent exploitation of results, quicker payments, more JU initiatives, only electronic submission of proposals and reports, single reimbursement rate for all activities.

Q19. Should new approaches to supporting research and innovation be introduced, in particular through public procurement, including through rules on pre-commercial procurement, and/or inducement prizes?

Main messages

- About 58% of the interviewees do not send any written comments or express a lack of awareness with regard to the topic of this question (mainly research centres and higher education institutes).
- Public procurement receives a wider support than the introduction of inducement prizes and awards. Roughly 18% of the respondents, representing the entire spectrum of stakeholders involved in the consultation (more than 32% considering only industry-related answers), recognize the large, untapped potential of the public sector purchasing power to drive innovation and stimulate private R&D and stress that the adoption of public procurement schemes would provide public sector bodies with innovative solutions to perform their public tasks more effectively and to better address societal challenges. Among those comments, several ones specifically call for supporting pre-commercial procurement as a tool to foster innovations in technologies and services and address societal challenges.
- Less than 10% of the contributions highlight that inducement prizes can be an effective way to stimulate research and innovation, provided that they are highly visible, attractive and well marketed as a Europe-wide acknowledgement of achievement.
- Among the negative feedbacks (around 9%), a major part does not consider the introduction of prizes as an efficient and beneficial instrument for industrial innovation and express scepticism about the capability of prizes in fostering research and innovation. Some comments believe that the introduction of prizes could distort the market and be counterproductive as it could lead to a narrowing of applications to chase those prizes. Several remarks from private companies highlight that prizes for innovation do not look attractive and rewarding because the chances of success are too small.

Specific comments

- Demand-driven innovation policies have significant potential that has not been fully utilized at EU level. New approaches need to be developed in this direction.
- Around 5% of the contributions (16% considering only the industry-related ones) highlight that pre-commercial procurement (PCP) can be a powerful tool for driving innovation and the Commission should encourage Member States to develop PCP schemes. PCP could be an efficient instrument because of its capability to shorten the process "from idea to market" and can therefore speed up the deployment of the results of research activities. Several remarks stress the need to clarify some legal issues related to PCP, especially IPR.
- Instruments like Green Public Procurement (GPP) should be promoted to increase the use of innovative green technologies in order to build best practices and increase market replication.
- Follow the example of USA in the field of public procurement (SBIR model) and learn from best practices.

- EU co-funding in the context of the Structural Funds could be used to stimulate procurement of innovative solutions.
- Prizes should cover all fields of research and if possible should specifically target young researchers, helping them to start their activities. Specific support to inducement prizes as a tool to promote curiosity-driven research.
- There is a strong need to support entrepreneurship, create a stronger connection between universities and entrepreneurs and make research careers more appealing (suggestion coming from research and higher education institutes).

Q20. |How should intellectual property rules governing EU funding strike the right balance between competitiveness aspects and the need for access to and dissemination of scientific results?

Main messages

- As far as research is publicly funded, the free dissemination of its results (at least after a delay) should be the rule.
- A specific case by case-approach depending on the subject matter (e.g., software, medication, scientific articles, etc.) as well as on the kind of research concerned (basic, pre-market) seems suitable.
- The design and the practice of the current system appears to be balanced in the sense of question 20 and adequate, in particular the approach of solving problems mainly at the individual level (GA, CA) while having a State institution as a safeguard; though, also MCA should be adopted. In any event, a future system should remain flexible.
- Open access, open source and patenting (probably with a deadline for a registration) seem to be adequate instruments for the dissemination of results and their promotion; more awareness-rising and more assistance as to IPR could be useful, though.
- An at least partial harmonisation of the legislation should take place (e.g., above all through an EU Patent). Furthermore, IPR Rules should be more consistent throughout all EU Programmes.

Specific comments

- Patent periods could be shortened or fees decreased or IPR could be limited to industry-specific EU Research Programmes; if no exploitation within a defined period takes place, it could be released.
- Patenting can slow down technical progress, as apparent from the US system; patents which prevent marketing should be avoided; there is no need for strict IPR or for IPR at all, on the contrary they form an obstacle. On the other hand, the US 'first to invent' instead the 'first to file' could be useful.
- Some exclusive rights necessary for the amortisation of private investment (not least for the sake of SMEs which can build on results); regarding multinational enterprises for instance, no limitation of access rights to the EU.
- Successful market introduction is the best publicity for EU Research Programmes.
- Certain thoughtfulness towards SME (though, very differing proposals for the implementation, from having very strict up to no binding rules, enhanced funding of their IPR activities, providing advice, ownership of all IPR, etc.)
- Different treatment of small and large (and (strategic) projects and particular consideration of sensitive areas.
- More exchange of best practice in protection; tutoring instead of imposing IPR rules could be better; more support and training throughout the whole cycle.
- Dissemination and exploitation of EU research results after projects end is not sufficient; EU should prevent this in order to avoid loosing valuable research outputs.
- More publicity for the projects.
- Large shares of EU funding for innovative, patent and open source oriented projects; higher funding for agreements to make IPR produced generally accessible.

- Licensing should be also as open as possible (according proposals already in the ex-ante phase) and cheap (at least for EU companies); more smaller projects.
- Promotion of licensing agreements as much as IPR; gratis licensing of unexploited IPR.
- IPR rules are more relevant for marketing than for R&D; moreover, if competitiveness should be improved, EU should focus on the research community, i.e., the people, but not on formalities like number of patents, IPR, etc.
- Adaptation of IPR to the collaborative work instead of joint ownership.
- Improving the exploitation plans and the project follow-up.
- Restore the FP5 mandatory Technology Implementation Plan and making it mandatory throughout the whole lifecycle.
- Different treatment of the different phases, i.e., "pure" or basic and applied research with making the first one generally available (e.g., IMI, Human Genome Project) and focussing IPR Rules more on the latter.
- Creation of a dedicated EU body to encourage dissemination (and to discourage individual exploitation).
- IPR protection created by EU-funded projects by law.
- Adoption of the European IP Charta or taking it at least into consideration.
- Provision of more EU-wide databases (so far, project results are too split) – e.g., CORDIS.
- All EU citizens should own IPR created with the help of EU funding.

Specific comments as to 'Open Access' in particular:

- A clear definition of "open access" is needed, whereby a distinction must be made between access to background material and research data, and access to publications.
- Open access may have a positive impact for faster exploitation.
- EU should 'move towards an open access/open source/creative commons bias' and 'err on the side of openness'.

Sensitive points

- Too mighty scientific journals (in terms of market power, price, etc.).
- IPR Piracy.
- IPR must not negatively affect common and crucial agricultural heritage.
- There should be no patents on life.

Q26. How should international cooperation with non-EU countries be supported?

Main Messages

- **Global problems and common strategic interests are important drivers of international cooperation**
  e.g. *"International cooperation activities should address the global challenges allowing Europe to participate to global solutions".* (APRE – Italian Agency for the Promotion of European Research)
  e.g. *"…the contributions of partners from outside Europe significantly enrich the research conducted under FP7, thereby delivering for Europe and its partners mutual benefit, including the enhancement of their respective economic competitiveness , a strengthening of knowledge generation capacities, as well as the harnessing of science and technology to address global challenge".* (INCO NCP coordination project INCONTACT)
- **Use international cooperation to support EU interests (competitiveness, economic development)**
  e.g. *"The European added value expected from cooperation should form the basis of specific international collaborations beyond Europe. The international competitive*

situation should be taken into account so as to take advantage of innovation opportunities for Europe."(German Federal Government)
e.g. *"…il est nécessaire de veiller à ce que le transfert et la valorisation des résultats de la recherche soient plus favorables à l'économie européenne notamment lors de partenariats avec des équipes situées dans des pays industrialisés ou émergents qui sont ou seront nos principaux concurrents".* (CNRS)

- **EU international cooperation should pursue a strategic approach and pursue reciprocity (i.e. participation and funding)**
  e.g. *"The international dimension of the next Common Strategic Framework should be supported by a strategic approach taking into consideration the non-EU countries' specific strengths and strategies and based on equal partnerships and reciprocity."* (Romanian National Authority for Scientific Research)
  e.g. *"[EU] international cooperation programmes, notably with organisations from emerging economies, must imperatively be based on the principle of reciprocity" (European Alliance for Innovation)*

ANNEX 5 - RESULTS OF THE SURVEY ON THE ADMINISTRATIVE EFFORT REQUIRED BY THE FUSION ASSOCIATIONS TO PARTICIPATE IN THE CURRENT FP7 IN THE FRAMEWORK OF THE IMPACT ASSESSMENT ON THE "RULES FOR PARTICIPATION" FOR THE 7TH EURATOM FRAMEWORK PROGRAMME

RESULTS OF THE SURVEY ON THE ADMINISTRATIVE EFFORT REQUIRED BY THE FUSION ASSOCIATIONS TO PARTICIPATE IN THE CURRENT FP7 IN THE FRAMEWORK OF THE IMPACT ASSESSMENT ON THE "RULES FOR PARTICIPATION" FOR THE 7TH EURATOM FRAMEWORK PROGRAMME

On the 14 of March 2011, within the exercise of the Impact assessment on the Rules for Participation of the 7th EU and Euratom Framework Programmes, the Commission launched a survey addressed to the 27 Euratom Fusion Associations to collect information on their administrative efforts required to participate to the current FP7, mainly the various processes to manage the Contract of Associations and EFDA tasks, in particular the Euratom financial contribution.

The deadline to answer to this survey was fixed to the 31st of March 2011 and the Commission received 19 responses out of 27.

The information from the survey (excel table enclosed) will be used in the preparation of the nuclear energy research Community Programme that will start from 2014, and more specifically to assess the potential effect of the revision to the Euratom "Rules for Participation".

INTRODUCTION ON THE FUSION ASSOCIATIONS

All 27 EU Member States participate in the Euratom Fusion research programme, as well as Switzerland which has had an agreement with Euratom to take part since 1979.

The principal mechanism of participation in the programme is the “Contract of Association”. Each state, or organisation within a state, concludes a contract with Euratom, creating a “Euratom Association”. This contract specifies the programme of work to be undertaken by the Association within the overall Work Programme for fusion in the Euratom Framework Programme, and provides the mechanism for funding from Euratom. A Steering Committee, made up of members from the national and Euratom sides has responsibility for guiding the activities of the Association.

All EU Member States have fusion Associations, except three of the newest, Cyprus, Estonia and Malta, plus Luxembourg, where the level of activity is presently too low to justify the formation of an Association. They participate as “trans-national research units” of the Association in a neighbouring Member State.

Researchers from all EU Member States can therefore participate in the programme through the 26 fusion Associations.

Some of the Associations have large-scale experimental facilities, while the smaller Associations generally do not. In return for a significant contribution to the capital cost of

building large facilities, the financing rules in the Contracts of Association oblige the Associations running them to give access to researchers from other Associations.

An additional financial contribution is also provided to encourage the smaller Associations to participate in the larger experiments by developing and installing auxiliary hardware such as plasma diagnostics. Clustering of several Associations who take joint responsibility for an experimental device or programme of work also helps smaller Associations to make a significant contribution.

To assist the exchange of personnel between Associations involved in collaborations, a "Mobility Agreement" provides support for travel and subsistence costs. The extensive network of collaborations between Associations has been a key element in the development of a programme which is unique in being fully integrated at the European level.

Further coordination of research activities, including for the joint exploitation of JET, is ensured by the European Fusion Development Agreement (EFDA), through which Euratom provides additional financing for activities considered as priorities.

The structure of the European Fusion Programme is aligned to the medium and long term objectives i.e. realisation of ITER and creation of prototype reactors for fusion power plants.

The budget for the Euratom fusion research under the 7th Euratom Framework Programme (2007-2011) is of EUR 1,947 million (EUR 390 million per year on average). During the first 4 years of FP7 (2007-2010), Euratom has committed a total of EUR 1393,5 million for fusion R&D. About 56% of the expenditure was dedicated to ITER construction (Europe is the largest contributor, accounting for about 45% of the total construction cost) and remaining part was spent on research activities (17% for research coordinated by EFDA, 37% for other research activities in the European fusion laboratories, and 46% for the joint exploitation of JET).

THE MAIN RESULTST OF THE SURVEY

The survey was structured in 5 sections covering:

- General information on the Associations
- The administrative tasks of legal and financial nature
- The administrative tasks covering the planning, programming and EFDA
- Auditing of the Association
- Simplification options for future Euratom programmes

1. GENERAL INFORMATION ON THE ASSOCIATIONS

The majority of the Associations are composed by either Higher or Secondary Education establishments or by non-profit research organisations. It is significant to underline that only two participants in an Association are Small and Medium Size Enterprise (NRG in the Netherlands and the Institute of Applied Mechanics Brno Ltd. in the Czech Republic).

18 of 19 Associations that have answered the survey indicated that they had already participated in past Euratom Framework Programmes and thus, they were familiar with the

Euratom fusion Associations procedures and funding mechanisms. Only the Bulgarian Association had no previously participated in a Euratom Framework Programme.

The composition of the Associations is very different from one to the other: 6% of the Associations are composed of only one institution while 10% of the Associations are composed of more than 5 institutions.

2. THE ADMINISTRATIVE TASKS OF LEGAL AND FINANCIAL NATURE

The Associations spent around 2 to 5 person-days to become registered and validated as a legal entity in the EU data base (Legal Entity Form and Bank account documents). However Romania reported that they needed to get this task done up to 30 person-days.

As regards the management of the distribution of the European funding the Associations reported that they have devoted from 3 to 5 person-days to carry out this task, while the Romanian Association reported a much higher amount, up to 100 person-days.

Concerning the preparation and submission of the financial statements to the Commission, the responses of the Associations vary enormously from 2-3 person-week to more than 50 person-days, with Belgium the Association reporting less person-days (only 5) and the United Kingdom, the Association reporting more person-days (up to 70).

Also, the Associations have reported important differences on the person-days devoted to carrying out related legal and financial administrative tasks that may be needed under the Contract of Association as for example, instructing the staff on Euratom requirements and ensuring compliance with time-recording, sub-contracting procedures, etc. The differences can go from 1 or 2 person-days (Greece and Poland) to 100 person-days (Romania).

As regards the use of a recording system, almost all the Associations declare its use for researchers and only very few have responded that they only use it if it is requested by the customer or institution funding the entities of the Association.

In addition, the Associations identified the audits and on the on the spot cost control missions, the IPR management, the administration of the Mobility and responding and managing EFDA calls for priority support, as additional processes and tasks of legal or financial nature which required significant administrative effort. Specifically, some Associations experienced difficulties in coping with the financial, legal and administrative requirements imposed by the Fusion schemes, notably on the reporting and the management of the different instruments, notably EFDA.

The corresponding effort in person-days of these additional tasks and process can vary a lot among Associations and can be up to 0,5 person-year.

3. THE ADMINISTRATIVE TASKS COVERING THE PLANNING, PROGRAMMING AND EFDA

The working time devoted by each Association for the overall implementation of the work of the association is above 5 person-days with a maximum of 35 person-days reported by Germany (IPP) which is the biggest Euratom Association.

This number increases drastically when the Association is preparing the progress report, the mobility plan, the annual work programme and all those other reports which are reviewed annually during the Steering Committee of the Associations. The time spent in preparing these documents and reports are easily above 20 person-days. This is also the case for the preparation of proposals to be submitted to the EFDA calls and the management of the EFDA Implementing Arrangements which are in general above 5 person-days and more than 35 person-days in the case of Slovenia, Romaina, KIT (Germany), Denmark and UK.

The Associations have also devoted an important amount of working time to communication activities, including dissemination of results. Most of the Associations exceeded the 5 person-days and some of them like Slovenia and Romania have largely exceeded the average with 30 person-days.

It is interesting to note that some Associations have showed concern about the lack of tools to keep track of the EFDA tasks and the time necessary to prepare these tasks for each work programme.

Finally, the Associations underlined that the fragmentation of EFDA, the Baseline support and the different systems for funding fusion research complicated the management of the fusion activities by the Association. In addition, the Associations indicated that the delays between the planning and the response to the EFDA calls, and the delays to receive the Community funding complicated the management of the fusion activities by the Association.

4. AUDITING OF THE ASSOCIATION

Most of the Associations have devoted more than 10 person-days as working time required to interact with the auditors, with the United Kingdom, being the Association devoting more time with 25 to 30 person-days and Denmark and Belgium the Associations using less person-days (2 person-days each). The Associations reported that they are also devoting more than 5 person-days per year to collect the necessary information and documentation for the audits, withy 10 person-days, being the most common number indicated by the Associations. However Romania was only devoting 1 person-days, Belgium 2 person-days, Denmark 3 person-days and IPP (Germany) up to 75 person-days.

The implementation of the audit results required less person-days than the working time required to interact with the auditors. Between 1 and 5 person-days were reported by most of the Associations, with the exception of Hungary and CNR (Italy), both reporting 10 person-days.

In addition to the above administrative tasks, some Associations stated that the audits by the Commission services, the financial certificate and the introduction of the time sheet recording created additional significant administrative efforts in their participation to the fusion part of the Euratom Programme.

Finally, some Associations showed concern on the additional time needed to explain the fusion mechanisms to the auditors and the need to collect the required old data for the audits, as the costs incurred far back in time.

5. SIMPLIFICATION OPTIONS FOR FUTURE EURATOM PROGRAMMES

All Associations, expect Hungary, indicated that they would like to continue with the current system of Contract of Associations in future Euratom Framework Programmes. These Associations considered that the Contract of Association proved to be a good tool that works quite well. However, the Associations considered it necessary to introduce some improvements and to guarantee at least the 20% of Baseline support from the Community to the fusion activities.

Some Associations indicated that they would prefer to increase the use of the "Implementing Agreements" or the use of "Project-specific lump sums", instead of the current funding mechanism.

In general most of the Associations would like to see simplification on the financial rules, the administrative procedures and to have fewer audits.

As regards the position of Hungary, its Euratom-Fusion Association would like to change to a different system based on simpler rules.

Finally, as the top priority for simplification measures to be introduced in the programme starting in 2014, the Associations indicated that the most important measure would be the increase of projects and the participation to the EFDA priority support and putting the financial support given under EFDA outside the Baseline support. Also, the Associations indicated that measures should be introduced to simplify the financial rules, including those applying to F4E, avoiding micro-management and respecting the deadlines for the Community payments.

Annex

Survey of Euratom Fusion Associates on the Administrative Effort required to Manage their Participation under the 7th Euratom Framework Programme for Nuclear Research and Training Activities

This survey is addressed to the Euratom fusion Associates participating in Euratom FP7. We would be very grateful if you could take a few minutes of your time to respond to the enclosed questions.

The purpose of the survey is to gather information on your Association's participation in Euratom FP7 (including the extension till end 2013). This information will be used in the preparation of the programme that will start from 2014, and more specifically to assess the potential effect of revisions to the Euratom 'rules for participation'.

The questions are intended to identify the administrative effort needed in the various steps and processes of your Association's management of its obligations under the Contract of Association, and in particular the Euratom financial contribution. In your responses please exclude all effort required to manage other sources of funding such as from F4E or the ITER Organisation. However, effort required for EFDA tasks should be included.

The survey is structured as follows: Section 1 covers general information, Section 2 covers administrative tasks of a legal and financial nature, Section 3 covers administrative tasks related to planning / programming / EFDA, Section 4 covers auditing and Section 5 covers simplification options for future programmes. The survey also offers the possibility to add comments and provide opinions.

When responding, please note the following:

- The responses should be, to the extent possible, those of your Association (or organisation) and not you personally.
- You should answer all questions; should you lack the relevant information or should your Association not be concerned, please indicate 'don't know' or '0 person-days (N/A)' – i.e. not applicable.
- In estimating the effort required, please consider only the administrative effort related to your obligations under the Contract of Association and EFDA and managing the related funding from Euratom. The scientific & technical management of the different projects within the Association's work programme should not be considered as part of this administrative effort.

If you have any questions you may contact Mrs Rosa ANTIDORMI at the following e-mail address: rosa.antidormi@ec.europa.eu

Many thanks for your contribution!

1 General information on your Association and participation under Euratom FP7

1.1 Number of organisations (i.e. separate legal entities and/or institutes) in the Association: ……

1.2 Your Association is composed of the following types of organisation:

O Higher or Secondary Education Establishment

O Non-profit Research Organisation

O Public body (excluding Research Organisations and Secondary or Higher Education Establishments)

O Private for-profit entities (excluding Higher or Secondary Education Establishments)

O Other (please provide more details: ……...)

1.3 Are any of these organisations a Small or Medium-Sized Enterprise (SME)?

O Yes (please specify which: ……)

O No

1.4 What is the country of establishment of your Association? ……

1.5 What is the average annual Euratom contribution (in Euros) to the activities of your Association over the 4 years 2007-2010? ……

1.6 Is this your Association's first Euratom Framework Programme (FP)?

O Yes – 1st participation during Euratom FP7

O No – participation also in previous FPs

2 Administrative tasks of a legal and financial nature relating to the Contract of Association

2.1 How much working time did your Association (or organisation) require to become registered and validated as a legal entity in the EU data base (Legal Entity Form and bank account documents)?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

2.2 If your Association comprises several organisations (i.e. legal entities and/or separate institutes), how much working time per year is required by your Association in managing the distribution of Euratom funding?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

2.3 How much working time per year does your Association typically require to prepare and submit financial statements to the Steering Committee (annual accounts, mobility, EFDA, JET) and deal with other possible requests from the Commission for refinement/correction/completion after the Steering Committee meetings?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

2.4 How much working time per year is required to carry out related legal and financial administrative tasks that may be needed under the Contract of Association (e.g. instructing staff on Euratom requirements and ensuring compliance with time-recording, sub-contracting procedures, etc.)?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

2.5 Does your Association implement a time recording system for researchers?

O Always

O Only if requested by the customer/funder

O Only for Euratom-related effort

O Never

O Don't know

2.6 Can you identify any other process / task of a legal or financial nature as part of Euratom participation that has required significant administrative effort by your organisation?

O Yes, please provide details: …….

O No

2.7 How much working time did your organisation require to complete this other process / task?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

2.8 Please provide below any comment that you may have regarding the administrative effort related to these legal and financial aspects in general required by your organisation: ……..
……
……..

3 Administrative tasks related to planning, programming and EFDA

3.1 How much working time does your Association devote per year to the direct interaction with the Commission as part of the overall implementation of the work of the Association (attendance of Steering Committee meetings, other related meetings)?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: …..

3.2 For the Steering Committee meetings, how much time is needed by the Association per year to prepare the progress / annual reports, the mobility plan and report, the annual work programme under the Contract of Association, the multi-annual work plan and all other relevant documents?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

3.3 For the participation in EFDA, how much time is needed by the Association per year to prepare the proposals for the EFDA calls (including setting up of collaboration networks, etc.) and in managing involvement in EFDA Implementing Arrangements?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: …..

3.4 How much working time does your Association require per year to deal with communication activities (e.g. dedicated Website, Association 'open days', dissemination of results, etc.)?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

3.5 Can you identify any other process / task in the phase of administrative management related to planning, programming and EFDA that has required significant administrative effort by your organisation?

O Yes, please provide details: …….

O No

3.6 How much working time did your organisation require to complete this other process / task?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

3.7 Please provide below any comment that you may have regarding the administrative effort related to planning, programming and EFDA in general required by your organisation: …….
…….
…….

4 Auditing of the Association

4.1 How much working time does your Association require per year for interaction with auditors?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

4.2 How much working time does your Association require per year to gather the information / documentation necessary for audits?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

4.3 How much working time does your Association require per year to ensure audit follow-up and implementation of audit results?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

4.4 Can you identify any other process / task related to auditing that has required significant administrative effort?

O Yes, please provide details: ……

O No

4.5 How much working time does your Association require to complete this other process / task?

O Don't know

O 0 person-days (N/A)

O 1 person-day

O 2 person-days

O 3 person-days

O 4 person-days

O 5 person-days

O More than 5 person-days. Please indicate: ……

4.6 Please provide below any comment that you may have regarding the administrative effort related to audits in general required by your Association under FP7: ……..

……...
…….....

5 Simplification options for future Euratom programmes

5.1 What would be the preference of your Association as regards the system of funding for the Euratom fusion programme starting 2014?

O Don't know

O Continue with the current system of Contracts of Association (scenario 1)

O Set up other funding mechanisms for fusion research activities (scenario 2)? Please give details: ……
……
……

5.2 Please provide any comments you may have on scenario 1: ...…….
……
……

5.3 If you consider another system of providing research funding to be particularly simple and efficient, please indicate the name of this programme and if possible the funding organisation: ……..…….
……
……

5.4 When compared to FP7, this research funding programme has:

O Simpler financial rules

O Better IT tools

O Quicker procedures

O Fewer reporting requirements

O Fewer audits

O A higher level of funding

5.5 What would be your Association's top priority for one concrete and feasible simplification measure to be introduced in the programme starting 2014?

……...
……...…
……...……...

Administrative survey FP8 Fusion.xls