Report of the workshops on the Common Strategic Framework (CSF)\(^1\)
for Research and Innovation:

**Inclusive, Innovative and Secure Societies Challenge**

**Introduction**

Two workshops on the "Inclusive, Innovative and Secure Societies Challenge" were organised by the Directorate General for Research and Innovation in conjunction with the Directorate General Enterprise and Industry and Directorate General Information Society and Media. The workshop with Stakeholders took place on 27 June 2011 and the one with Member States and Associates States on 13 July 2011. These workshops complement the public consultation launched by the European Commission on the Green Paper 'From Challenges to Opportunities: Towards a Common Strategic Framework for EU research and innovation funding' – COM(2011)48.

The underlying logic of the CSF called "Horizon 2020" is to shift the emphasis of community activities in research and innovation from a diverse set of programmes with a range of different priorities towards programmes that work with common strategic priorities, specified by important societal challenges, competitiveness and research excellence. It implies also a shift from staged support to the phases of the innovation cycle (R&D, demonstration, market take up) to coherent support for projects and organisations across the innovation cycle from research to retail and lastly it implies a shift of emphasis from R&D towards stronger support for innovation, including non-technical innovation and market take up.

In this context the workshops aimed to provide insights for the future strategic priorities of research and innovation up to 2020 and in particular to refine the conception of the societal challenge “Inclusive, innovative and secure societies”.

The workshops were both structured in presentations and discussions about:

1. Research and innovation for inclusive societies
2. Responsible research and innovation
3. Scientific support to research and innovation policies
4. Research and innovation for inclusive and trustworthy digital societies
5. Research and innovation for secure societies

The first workshop was attended by a large variety of stakeholders coming from academia, research community, industry and civil society organisations. The second workshop was attended by representatives of Member States and Associated States coming from four committees: Social sciences and humanities, Science in society, Security, and information society.

\(^1\) This report is based on the speeches, presentations and discussion at the workshops. More information including the slides, the programmes and the lists of participants are available on: http://ec.europa.eu/research/social-sciences/. We thank the participants at the workshops for their valuable insights and the rapporteur, Prof. Nigel Lucas, for this synthetic work.
1. **Research and innovation for inclusive societies**

*New models of development and Innovation are complex processes that needs to be better understood*

The future of Europe is increasingly determined by the ability of its governments, industries and citizens to integrate and deploy innovation processes through economic, societal, and cultural measures capable to advance smart, sustainable and inclusive growth. Innovation today means more than purely traditional industrial innovation; it covers both technological and social innovation; it deals with the manufacturing sector, but also with the services sector. Innovation involves complex learning processes, “informal” or tacit knowledge, experimentation, testing and new product development. A first priority of research is better to understand these new or rediscovered processes of innovation. Empirical research is needed and greater theoretical clarity has to be achieved concerning the structure and function of innovation systems.

New technology is neither necessary nor sufficient for innovation. The human aspects are often the most challenging; social sciences have the tools that can help analyse the human dimension of processes and see how best to transfer new knowledge and ideas among individuals and cultures.

Research on the link between research and innovation suggests that its realisation relies on a diversity of sources of knowledge; successful innovations increasingly result from involvement of a wide set of stakeholders, often on an open access basis or from active engagement of users during the innovation process. Much remains to be done more effectively to comprehend the dynamics of these relationships: how does innovation occur, how is its character changing, what are the critical institutional conditions, what is the role of culture and values and why are some societies more innovative than others. It is essential that these processes are understood and that appropriate interventions are proposed, if Horizon 2020 is to succeed. Europe has a good track-record here as it excels in creativity and cultural debate. There are good opportunities for adding value from the social sciences to the development of technologies.

The reciprocal relationship between users and developers of innovation must also be better appreciated. Technologies are shaped and re-shaped by human intervention; innovations have to respond to the needs of industry and society and users ultimately determine their success. More effort (and funding) is desirable to manage social change in a way that motivates users to accept and uptake innovations that are helpful to the resolution of societal challenges. Behavioural change has the potential for effective and efficient intervention and social science has much to contribute in helping design the best interventions to encourage behavioural change, through specifying effective partnerships of public, private, voluntary provision, involving service users and devising indicators and measuring procedures for evaluation.

Overarching political aims to foster sustainable growth, secure jobs and boost competitiveness will demand not only technical creativity, but will rely upon social innovations that work through new forms of interactions, organisations and services to improve the quality of life. The appreciation of the workings and potential of social innovation is still in embryo. Social innovation is a new area to be addressed both as a field for research and as a field for application and demonstration. Research on social innovation should lead to better ways of encouraging and involving societal actors, incorporating social innovation into the public sector, developing innovative educational approaches and harnessing migration and diversity. The concept of social innovation must be inherent in Horizon 2020 and cultural and societal knowledge will in turn be central to social innovation.

Innovation is not an end in itself, but is a tool to help deliver social and political goals, in particular those enshrined in the Europe 2020 strategy of smart, sustainable and inclusive growth. Social science has the possibility to inform the discourse about the nature of this
goal, to assist in its achievement and to monitor the progress. Key prerequisites will be the proper articulation of research and innovation, the effective implementation of all kinds of innovation and better governance at all levels.

*Europe must adjust to its changing position in the world*

Europe 2020 must be delivered within the context of a rapidly changing global society. Political and financial power is shifting East and the economic, social and political dynamics of the world will adjust accordingly. The consequences for Europe, the constraints that these changes will impose and the strategies that might be adopted should be illuminated by social science research. China, India and Brazil offer enormous markets – but represent also new sources of competition. The implications for European labour markets and citizens need to be analysed and strategies devised to penetrate those markets.

There are also pressing needs to help alleviate global poverty, especially in Africa. A particular and disruptive expression of political and global environmental change will be the consequences of environmentally induced migration. Effort will be required to determine how the EU can contribute to manage migration; in the coming decades attitudes may change, Member States may encourage immigration and that affect societies.

*Social sciences can contribute to all societal challenges*

The societal challenges are at the heart of Horizon 2020 and they link back logically to the Innovation Union and to Europe 2020. Evidently, all societal challenges need social sciences analysis and it is appropriate that publically funded research should try to map and understand the needs of diverse and complex societies and enable them to cope with difficult transitions. Solutions must be based in an adequate understanding of human behaviour, must address core problems rather than symptoms and are likely to require much deeper societal adaptation and innovation than is generally recognised. It is the nature of a societal challenge that it involves interaction of individual and collective behaviour (the ‘social’) with technology. Many adaptations are likely to require deep transformations of culture and values that can only be identified and proposed by social sciences research; they are also unlikely to act equivalently throughout the social strata, regions and income levels and will create new possibilities for exclusion and new populations of excluded people.

Without prejudice to the importance of other social challenges, the challenges associated with health, energy, environment and ICT are especially revealing of the contribution that social sciences research can make. There exists widespread uncertainty about the affordability and effectiveness of traditional modes of welfare (cf. health care cost in an ageing society). There are key questions on the paradigm shifts towards world and European sustainability in the next decades (cf. move towards a low-carbon society). There is a need for research on attitudes and behaviour with respect to the approach to long-term issues.

The legitimate aim to focus research on societal challenges should not detract from the need also to improve the human and physical infrastructure for research across Europe. The potential in Europe for social science research to address complex social processes is not being realised; the wonderfully diverse ‘natural laboratory’ for comparative research that Europe offers is underused. Comparisons across countries can help identify the influence of culture and values on decision and practices and this understanding will be important in profiting from Europe’s variety and tolerance.

Mainstreaming of social-science research within technical work has much to recommend it, but care will be needed to avoid SSH becoming a sub-contractor to technology-led projects. It is also of concern that such arrangements may not lead to genuine inter-disciplinary work.
that causes partners to shift the nature of their thinking as opposed to multidisciplinary work where they bring their expertise in distinct parts to a common task.

The resource in Europe is impressive; it is striking that over 30% of researchers in Europe claim to have a social science background, but only 1.23% of the resources of FP7 were directed to research in social science. The low funding means only 10% of applications in social sciences and humanities are successful. Infrastructures in the socio-economic sciences and humanities are still underdeveloped, but may be pre-conditions for the successful undertaking of research. There is also a great potential for social sciences in the European Research Council and Infrastructure activities. It is necessary, for e.g. to invest to make better use of existing national data and to encourage sharing of these resources.

A large transnational network of social sciences stakeholders (NET4SOCIETY) has proposed a specific independent challenge "Understanding Europe" covering four main blocks of activities:

(i) Building resilient societies (societies in transition, smart and sustainable growth, demography, diversity and inequality, cultural change, memory and identity). This block would need 1.8 billion €

(ii) Social innovation (social entrepreneurship, social dimension of grand challenges, creativity and innovation, new media and networks, diversity and migration). This block would need 700 million €;

(iii) Actor Europe (Europe in the world, Governance issues, Democratisation and development, Human rights and global values, Conflicts prevention and global justice). This block would need 900 million €.

(iv) Education and employment policies in a modern economy (Intergenerational equity, Innovative Educational systems, welfare and employment policies). This block would need 1.2 billion €.

2. Responsible research and innovation

Horizon 2020 cannot be truly effective without the full engagement of Society in science and innovation

The concept of responsible research and innovation stands in continuity with the activity 'Science in Society' of FP7 that aims to stimulate the integration of scientific and technological endeavour with research policies in European society and to encourage Europe-wide reflection and debate on science and technology and their relation with society and culture. There is a change of perception of the relationship between science and society, moving from “science in society” to “science for society”. Such considerations lead to examine how the conduct is governed and how civil society participates in that process.

The mainstream view is that Horizon 2020 cannot be truly effective without the full integration and participation of all stakeholders. The objectives of ERA cannot be achieved if the social dimension of research and innovation is excluded or conducted without the involvement of citizens and entities from civil society. Although the relevance of the social dimension of science and innovation has been widely recognized within the EU and Member States and much good research has been done under the Science in Society programme, a clear and realistic strategy for improvement has not yet been formulated and implemented.

Horizon 2020 should take into account the promotion of civil society and citizen participation in the development of strategic research programs and the expansion of scientific interest in relevant social problems, particularly through the promotion and consolidation of social platforms and the creation of common areas of interest and dialogue. It is also desirable to
ensure simple and clear rules for participation in order to encourage the involvement of citizens and civil society in research and innovation.

Results of R&D financed by European funds should be better disseminated to the population; enhanced access will stimulate interest and participation of citizens. The question of accessibility and re-use of the results of publicly funded research (cf. scientific publications) is particularly relevant to improve knowledge circulation.

Efficient and professional science education and communication is essential. A scientifically literate society should be nurtured through appropriate science education methods starting at school. Research results should be made more visible to the public and to ensure it reaches the public in a democratic manner; priority should go to communication through the internet and social networking.

The definition of research agendas is a controlling influence on the research that gets done and the results delivered. In a democratic perspective, the assurance of responsible research and innovation can be best assured by consultation of citizens that are the carriers of the cares and expectations for the future. Such participation increases political credibility and helps to counteract the perceptions and the genuine risks of agendas being driven by narrow interest groups. Emerging issues for research are just as likely to develop from tensions and frictions in complex modern societies as they are from technical need; citizens are well qualified to identify those. Involving citizens in defining research agendas will contribute to the democratisation of knowledge and knowledge production and is a prerequisite of responsible research and innovation.

**Responsible science must permit divergent views**

There are agencies of civil society that would probably accept the broad logic of this mainstream position, but would go further. For some, the present governance structure is dominated by corporate interests and other lobbies and a radical restructuring is indispensable if research is to be genuinely geared to the needs of society. In this perception the priorities of research and innovation are at present seriously misaligned with social needs. The generous funding of expensive, high technology options has reduced the resources available for research in important domains such as environmental protection, preventative health, organic and low-input agriculture, energy-saving and renewable energies as well as for research which contributes to social change and problem solving that is not focused on technological fixes.

The proximate cause of this distortion is the dominance of agenda setting by academies, universities, research centres, policy makers and administrations and industry to the virtual exclusion of civil society. But, behind this selection of actors, lies the persistent idea that the future success of Europe depends on competitiveness, technological innovation and the contribution of research to growth (in the narrow sense of a growth of GDP rather than prosperity). Such thinking should be open to more inclusive governance and of sustainable innovation responding to social, ecological and economic demands.

Addressing effectively issues such as poverty, social, economic and ecological injustice, loss of biodiversity, climate change, resource scarcity, public health issues and democratic deficits would require a significant shift of current European R&I policies away from competitiveness and corporate influence towards more democratic processes of governance and a review of the prioritisation of R&I activities.

An Ethics framework for research and innovation is also indispensable to face with the rapid scientific progresses which could be raised into question by Society.

**Discrimination against women in science is still strong**
A distressing deficit of the Framework Programme has been its failure to deliver adequately on its intentions to redress the bias against women in science. There is overwhelming evidence that discrimination against women in science is still strong despite performance that at least equals and may exceed that of men. This prejudice is exercised at all levels – engagement, publication and promotion; it undermines research and the value of research. The execution of research suffers from the loss of able minds and the products of research are deficient because they do not express the true preferences and needs of the community.

The grand challenges of climate change, energy supply, water resources, ageing, healthcare and sustainable development all have important gender dimensions. The consequences of this accumulation of historic prejudice must be reversed; the gender dimension should be fully integrated in all aspects of Horizon 2020. The logic of this argument goes beyond research priorities for responsible research and innovation and implicates the whole governance structure of Horizon 2020.

For responsible research and innovation, a new "social contract between science and society" is called for and it could be focused on public engagement and a new 'technology democracy'; gender equality in research and innovation and the gender dimension in research content; enhancing the robustness of the research and innovation system through open access and knowledge circulation, a strong ethical dimension and innovation in science education.

3. Scientific support to research and innovation policies

The formulation, implementation and coordination of effective research and innovation policies require a large set of tools like relevant and accessible scientific evidence; models and processes for converting the evidence to policy-relevant guidance; and measures and mechanisms for monitoring and assessing success.

Evidence-based policy is crucial for more effective and efficient policies and for addressing competitiveness and societal challenges

Results of past EU research in these fields has produced a great body of scientific evidence about the design and implementation of regulatory frameworks and in particular the manner in which the control of factors that allow innovators to retain sufficient of the benefits from innovation to justify the effort. There is a much better understanding of the possibilities and limitations of market-based instruments such as subsidies and tax exemptions and the needs and costs of protecting intellectual property. However, the analysis requires further progress in many domains, e.g. for:

(i) Analysing the functioning of the (protected or not protected) knowledge and technology markets;
(ii) Understanding the mechanisms of open innovation (including through different types of clusters and knowledge centres);
(iii) Identifying and quantifying externalities, not only of research, but also of prototyping, demonstration activities, standardisation, and of innovation activities at large;
(iv) Improving the understanding of the various forms of public private interactions and the ways to reduce a perceived gap in science-industry gap;
(v) Analysing social and public innovation mechanisms, impact and policies;
(vi) Developing as a matter of priority a large scale metrics and analysis of research and innovation issues at sectoral and thematic level, needed to allow better information for the
formulation of policies and strategies (including smart specialisation) adapted to country and regions specificities.

Our metrics are indeed still coarse compared to the granularity and complexity of the interactions at play between the different stakeholders of innovation systems. The data needed for calculating more relevant indicators are very often missing or are considered as unreliable or not comparable across countries, including with third countries. Economic analyses still cannot go much beyond correlations between input and output indicators or benchmarking between countries. The link between on the one hand policies acting upon the science base or the innovation system and on the other hand S&T performance and economic output is largely missing. We mostly rely on macroeconomic models for estimating the expected output of our policies, the results of which are at best indicative.

The developments of this evidence basis needs to proceed in parallel with a specific attention given towards the understanding and quantification of impact of the research and innovation system, through an holistic process taking into account the institutional and organisational context. The Innovation Union flagship initiative, including the dimension of the completion of the European Research Area by 2014, and the self-assessment tool, as well as the guideline 6 of the Europe 2020 strategy all constitute good examples of ways to address the R&I issues in an holistic way.

In that context, policy coordination, with exchanges of best practices and support activities to test and determine the best combination of policy mixes constitute key domains to maximise benefit from a systemic approach to research and innovation, with a prospect of more efficient and effective public spending and better balance between demand-side and support-side policies.

The improvement of national policies relies indeed on the ability to extract and exchange best practice through mutual learning and coordination tools. The effectiveness of existing methodologies (e.g. OECD reviews, European Research Area Committee peer reviews, Europe 2020 assessments and recommendations) need to be vastly improved in particular with a view of supporting EU12 and less performing Member States.

Finally, the development of a monitoring and evaluation of impact on economy, competitiveness and on addressing societal challenges of the research and innovation programmes and policies must become systematic and coordinated on the base of agreed methodologies across the EU.

Effective International cooperation and demand-side measures matter

European innovation operates in a global economy. A more coherent and effective cooperation with third countries is needed in the field of research and innovation. This requires actions to support policy dialogue, networking and competence building, analysis of research and innovation policy trends and capacities in third countries, coordination and joint actions between Member States, as well the strengthening the EU presence in other regions of the world.

While actions to promote international convergence of regulations and standards as well as access to markets and public procurement in innovative sectors are necessary, global regulatory standardisation tends to reduce global diversity in knowledge production and innovation with probable costs in terms of reduced diversity in policy and regulatory responses to common global challenges. More evidence is required to clarify the tension between ‘national-local’ dynamics and globalisation dynamics of knowledge production and innovation.

Continued effort is required to identify effective stimuli to innovation and entrepreneurship (what measures are effective – how, when and why?). A particular area that deserves priority is to acquire reliable evidence on the effectiveness of demand-side measures to
stimulate innovation, for example public procurement and mission-oriented measures to promote innovation in areas of perceived importance. Hard evidence is also needed on the potential of non-profit and philanthropic organisations in research and innovation. This requires strengthening the evidence-base and developing methodologies and tools which are currently mainly oriented at monitoring and assessing the impact of public funding. The effective implementation of the IU requires new insight on how the framework conditions – from IP markets to access to private finance, from innovative procurement to better standard setting – improve the European business environment for R&I. The forthcoming innovation indicator will open huge new avenues for policy making at EU, national and regional level, with the potential of fostering the much needed structural change towards a European knowledge base economy. This requires new rationales, new policy insight, new governance tools etc.

Innovation is not only an outcome; it is a capacity and a state of mind in people, in firms and in organisations. Policies to build up that capacity and to promote that state of mind should be constructed on good evidence of what works and research should be directed at clarifying the relevant influences and processes. Questions to address include: examination of the consequences and effects of educational reforms in Europe; to what extent does the balance between academic excellence and societal relevance of education affect innovative capacity; how are European universities positioning themselves in the face of increased global competition and more stringent demands from society. The new role and contribution expected from autonomous universities, their modes of interaction with business actors, the emergence of a more open market for researchers etc. are different dimensions of ERA which require substantive work in order to monitor and steer the current ERA initiatives and the future ERA framework.

As the demands placed on policy change so the nature of forward-looking activities must change

A vital component of policy support is the conduct of forward looking activities. Policies can only be formulated in the context of an explicit or implicit view of the future and it is desirable that this view be explicit, founded on good evidence and presented cogently in a manner consistent with the objectives of policy. State-of-the art techniques would normally anticipate multiple, plausible futures and indicate the circumstances in which they would arise; they typically have a horizon of 5 – 25 years; they should accommodate uncertainty and highlight emerging opportunities and threats.

Much has been accomplished in past programmes and many successful techniques have been demonstrated and used for policy support, but naturally as the demands placed on policy change so the nature of forward-looking activities must change; the methodological scope will need to move beyond technological foresight to embrace shifts in values, institutions, behaviours and lifestyles. One of the most important adaptations that forward looking activities will have to make is to recognise the stronger call for stakeholder involvement throughout the policy cycle and to find persuasive means of integrating essential quantitative descriptions of the future from technical experts with qualitative expressions of other stakeholders. Better integration of forward looking activities in the policy and decision making process through institutionalisation and mainstreaming will still require attention.

Participatory forward looking activities should safeguard inclusiveness, should identify issues that truly matter to citizens, should ensure ownership of findings by stakeholders and should produce better analysis than before. The problems that need to be addressed are firstly that existing participatory methods, though very interesting and promising, still require validation and improvement and secondly that by their nature participatory techniques are heavy consumers of time and resources.

The thematic areas to which Horizon 2020 should direct effort are those that illuminate the future context in which societal challenges must be addressed. They will need to
accommodate new models and indicators of welfare and prosperity and to cope with new models of production and consumption. They should address both fairly predictable aspects of change such as aging, resource depletion and climate change, but must also envisage less predictable phenomena such as the unexpected political rebellion, migratory shocks and financial and commodity bubbles.

A plausible set of broad priorities would include geopolitics and governance (EU integration and role on the global stage), demographic and societal issues, territorial and mobility dynamics, energy and natural resources security and efficiency, environment and climate change, economic and technological prospects.

4. Research and innovation for inclusive and trustworthy digital societies

One of the few certainties about the future is global connectivity

The internet is a transformational technology and so is the mobile phone. These two approaches to information are converging and together will redesign society. The fundamental significance of mobile devices is that they allow the public or private service to know where is the user and when. There are few areas where the meeting of social science and technology is so exhilarating and perhaps treacherous.

The disruptive power of these technologies is already clear; Web2 and social networking offer new ways of communication, new possibilities of innovation, but also significant dangers to individual security and civil liberties. They offer huge possibilities to revitalise the delivery of public services, but only if access is assured to those who need the services.

The goal is to ensure that new digital technology facilitates both individual and collective life; is inclusive, participatory, secure and respectful of rights. Social scientists and technologists must work together from the beginning to achieve this goal by thoroughly scoping needs and possibilities, threats and remedies and by designing systems that simultaneously meet technical and social objectives. The presentations and discussion provided a rich analysis of the challenges and potential for research.

The empowerment conveyed through rapid access to diverse sources of information changes citizens from being passive recipients of services to active participants in service delivery. It also allows them to share information with each other and forms the basis perhaps for contesting received opinion and authority. Communication between peers allows the transmission of social signals and increases the diversity of information sources available to citizens.

For any provider of services, public or private, the huge volumes of information generated by these exchanges constitutes a rich source of evidence on preferences that can support public policy or that can give lucrative insight into markets. To benefit from these possibilities requires access to the information, and the means to organise it, understand it and use it. Technology is one key to this, but they behavioural and social aspects are equally critical. The future availability of wide-scale, ubiquitous semantic networks will only strengthen this process. These developments have a strong potential public service quality as many public services can be (and are being) offered through cloud computing solutions with significant potential savings of resources.

The range of sensors built into future mobile devices will create many opportunities

The combination of mobile devices with sensors can also assist individuals to cope with their environment in myriad ways. Children can be tracked for their safety through integrated
GPS and digital wireless technologies; the behaviour of the aged can be monitored continuously and regular medical diagnosis provided through the analysis of stools in suitably equipped toilets. There is already much intelligence built into cars for direction-finding, control and payment of services.

Many more adaptations of sensing with smart-phones can be expected. Always-on mobile phones will be universal sensors and will collect data from the user’s immediate environment and report in real-time. The range of sensors available is likely to be extended by miniaturisation, nano-technology and even bio-technology. The extent to which the user can control this information is unclear; as advanced applications produce more and more context information so new principles of protecting privacy will need elaboration. Multi-lateral security will be crucial, assuring not only the security of the operator, but also of the user and people in the vicinity.

Further in the future, we can envisage that everything, including people, has a web-address, and that this information plus the capacity to process it can be used to place all entities in a geographical context in real time. This is potentially a very disruptive tool; capable perhaps of benefitting society, but also pregnant with possibilities for exploitation by unscrupulous governments, organisations and individuals. The need for social sciences to understand the human and social implications of these possibilities and to design, test and evaluate remedies is critical.

**There are high expectations of eGovernance, but there are many problems to solve**

Effective governance is a key challenge for the EU with its diversity of values, economic structure and administrative capacities. There are wide divergences in performance across Europe. In the corruption index of Transparency International the various Member States are dispersed from the leading place (i.e. lowest perceived corruption) to place number 78 jointly with Lesotho and Thailand. There is clearly much to be done in levelling this field, preferably by bring the poorly performing countries up to the level of the best. Social science can help by strengthening diagnosis of the reasons for poor performance and by advising on remedies. This is a critical factor; there are high expectations of eGovernance for improving the delivery of government services through information and communication technology, but it is unlikely to be implementable if existing traditional administration does not work, for example tax collection in some Member States.

Improved governance must also consider how best to develop new forms of inclusive governance; in many cases the societal challenges affect disproportionately the excluded groups and it is important that their priorities and concerns are reflected in decision making. More generally, to meet the aims of an inclusive society, Horizon 2020 will need to place strong emphasis on all aspects of human capital formation, including investment in upgrading of skills and health of the low-skilled and excluded citizens particularly with respect to information and communication.

eGovernment and ICT promise to contribute much to a more efficient and effective management of the provision of welfare, but the delivery of this promise is problematic. The heaviest users of state welfare services are usually found among that part of the population least able to use ICT solutions and most vulnerable to exploitation of security failures. There are several important aspects for social science research; how to breach the digital divide; how to persuade users to respond positively to remote health care; how to persuade households to make necessary investment in “smart homes”; how to protect the vulnerable and how to use the huge amounts of “user data” to foster innovation and improvement.

*e-Inclusion is a precondition for the delivery of e-Governance*
A necessary condition for the delivery and personalisation of services in this manner is that individuals have access. Those in need of public services are generally disadvantaged - poor, ill-educated, sick, frail or unemployed. Often individuals will be disadvantaged in several ways and to different degrees in a way that is quite particular, but governments continue often offer remedial services in general ways that are designed to meet isolated conditions. Joining up these isolated offers into a personalised service is a huge challenge to public administrations that requires both technical and social science research. Social innovation will extend the range of suppliers of welfare services and public administrations will also have to learn how to collaborate with different providers.

Social science is need to ensure that the design and delivery of services addresses individual conditions in the best way and technical research is needed to ensure interoperability between providers of services; they cannot be joined if they cannot share information. Making complex decisions with multiple objectives will also require tools of analytical support.

Facilitating access to services concepts such as "inclusive design for all" that allows customised modifications to standard systems that compensate for specific disadvantages is also a specific task to be investigated by researchers. If access is created for disadvantaged individuals then assistance for personal needs can be delivered electronically. For example, allowing older people to live at home for longer with the possibility to contact family abroad and to treat themselves for medical conditions. This meets a social need, but also creates a huge potential market in which Europe has some advantage. Finally, access to these solutions depends on individuals having the skills to participate; digital competence is as important as literacy; novel approaches will be needed to create this competence among groups that will have little prior knowledge and who will lack underlying skills.

There are acute concerns over data privacy

Enforced unification of identities (for example, of our life as a patient, as a customer and as a tax-payer) is under way and not everyone may wish this to happen. The existing need for electronic devices constantly to verify credentials can also create trails of data for which users may not wish; research is needed to create a stable and reliable credential that does not create excessive data.

Multilateral solutions needs to be elaborated that consider the security of several parties and seek to protection their legitimate interests. Privacy by design is an important approach, whereby privacy and compliance with data protection is designed into systems holding information right from the start, but the approach is limited by the fact that privacy is an individual idea and varies from person to person; much more research is needed to develop working systems that reflect individual specificity and that can be updated to keep track of technical change. User-centricity to control data flows, empowers users and may help preserve anonymity. It is important that data flows and processing are transparent, so that what is collected and how it is used is clear. Multiple identities may need to be preserved, keeping spheres of human activity apart and restricting access. Minimisation the amount of data collected and decentralisation ownership are also ways of restricting the overview. The principle of data proportionality from data protection may be a starting point, but it has limitations in protecting the integrity of the person as the individual most often does not understand what information they have given away and who has it.

Identity management is an important part of any ICT system; it permits individuals (in a country, a network or an enterprise) to be recognised and their access to resources within that system to be controlled by associating user-rights and restrictions with the established identity. More research is needed to understand the acceptable limits of this procedure. Most computer systems of the future will be embedded in other devices. As users begin to understand that the iphone is storing much data about their behaviour, they may begin to
distrust the technology. Ways to ensure the trustworthiness of embedded systems need research. Europe has some advantage in research to balance functionality with privacy because it enjoys a long tradition of civil liberties and privacy to which many of these issues are related. A socially acceptable balance must be struck between the willingness to release personal data in return for higher welfare and the loss of privacy that this may imply. This balance will differ among individuals, over their lifetime and according to circumstances. The legitimate interests of third parties and the state will also have a bearing on these choices. If users are to take full advantage of the possibilities offered by mobile information technology then they need to trust the actors involved not to misuse information and to be confident that it will not be available to others. At present there is insufficient consideration given to the needs of stakeholders and the manner in which they differ among groups. The insidious notion that any data that is used for providing a service must be available also to law enforcement agencies may (or may not) be a positive factor for national security, but it is certainly a negative factor for many users. The opportunities and temptation to use data generated in civil business for national security and the obvious objections creates strong interdependencies with the research issues relevant to security discussed next.

5. Research and innovation for secure societies

Security is an enabler of other goals

A secure Europe is a precondition for responding successfully to the grand challenges. The European Security Research Programme launched in the seventh framework programme aims to help develop the necessary technologies and knowledge and to ensure their optimal and concerted use while safeguarding respect of privacy and civil liberties; it has an exclusively civil focus.

The European Security Research and Innovation Forum (ESRIF) – was created in 2007 to foster public-private dialogue and a shared view of European security needs. The forum brought together the suppliers of technology, the demanders of systems (police forces, airports, etc.) and the civil society interests.

To achieve secure societies in Europe requires deepening the current research in the area of internal security but also widening it to external security. Close links with the Common Security and Defence Policy and with the EU Internal Security Strategy in Action" are also necessary.

The specificity of security research must be recognised

For the security industry, the priority is to ensure an increased coordination between users and suppliers of security equipment and practices to provide competitive and cost-effective high technology solutions. Security “cannot be considered as a social science, but as a key element of societal life and a main driver for the creation of a European identity and common growth” according to the European Organisation for Security (EOS) that is composed of major European security stakeholders with more than 20% of the global security market

The present security research activities in FP7 are reaching good technological results and continuity should be assured in Horizon 2020 for the successful elements of these programmes. Nevertheless, there is common ground on the recognition that social issues are creating increasing constraints to new security technologies that should comply with specific (and sometimes still unclear) requirements for safeguarding human rights. There is acceptance that the societal dimension of security research should be enhanced by integrating the societal aspects into these activities. Citizens’ needs should be taken better
into account, in order to build trust of new security solutions. These societal aspects should be integrated the inception of new security solutions.

Among the themes presented and discussed are: the delivering of technologies and capabilities for combating serious and organised crime and terrorism, cyber-crime and cyber-terrorism; the improvement of the infrastructures and utilities security; the development of intelligent surveillance system; the European border security; the management of both internal and external crises and disasters. Research on the integration, interconnectivity and interoperability of security systems are also important elements as well as “bridging” (dual-use) technologies.

Severe reservations about including security in a social sciences led grand challenge were expressed by several stakeholders and Member States, as is noted in the final section of this report.

**Security should cohere with societal preferences**

The major Security non technological issues are trust and resilience. Trust between entities may be from citizen-citizen, citizen-state, state-state, and internal or external to Europe. Resilience implies the recognition that we cannot prevent all incidents and that we must also builds societies and infrastructures that can cope.

Societal scrutiny of security policy rests on four pillars: a firm legal and regulatory framework, an ethical overview, social interoperability and understanding of impacts and outcomes of interventions. The legal and regulatory framework exists (data protection, Charter of Fundamental Human Rights); the need in this respect is simply to assess solutions properly in their light. “Ethical overview” in this context means a wide-ranging analysis that tries to anticipate what might be the ethical implications of innovations in security. “Social interoperability” poses the question as to whether a solution works across multi-cultural Europe; needs and priorities vary very widely, so it follows that the expression of security problems faced by different Member States has a different nature in different parts of Europe (e.g. ecological immigration from Africa). Research should specify systems that can be adapted to the needs of all Member States and yet that stay within acceptable, common, ethical and legal and regulatory frameworks. Sustained progress depends on being able to measure impacts and outcomes and to know whether a remedy worked or not. To do this requires an agreed definition of security, the measurable indicators of security and means to measure the impact of measures on that security. Pursuit of this aim would benefit from philosophical and political intellectual leadership.

Horizon 2020 needs research to operationalise these ideas to ensure that technology and practice within the security sector remain coherent with societal preferences. Communication and education are fundamental; project teams need to be educated from the outset in the social issues and concerns that any innovation is likely to generate; preliminary diagnosis and agreement should ideally defuse potential adversarial relationships between technological and social interests from the start. Any effective social science participation should ensure proper and realistic recognition of the threats and challenges by all stakeholders, including their context. The search for solutions must focus on resilience as much as on prevention. An interdisciplinary approach must be assured; a genuine partnership must be guaranteed – the social sciences should not be seen as a sub-contract.
Conclusions

There is much to be said in favour of a direct and substantial social science-led grand challenge

The workshops confirmed for the most part a dynamic and constructive relationship between the social and technological sciences although the nature of this relationship and the balance between the two disciplines varied substantially from session to session. The sessions on “research and innovation for inclusive societies” and on “responsible research and innovation” were unsurprisingly dominated by social sciences and humanities and society engagement in science, whilst recognising that many of the challenges faced by society arise from, or require solution from, technology and therefore the effective integration of technical skills is essential to success in research.

The three pillars "inclusive societies", "responsible research and innovation" and "scientific support to research and innovation policies" deserve a specific action but they should also mainstreamed in all parts of Horizon 2020.

In “scientific support to research and innovation policies”, technology is the driver, but with big differences between the ICT and security applications. In the former case, the integration of social dimensions into the applications of ICT is so critical that it is fully recognised by industry as a main driver of their activities, to the point where success over the medium-term is likely to favour those companies who manage to achieve the social impact rather than those who make the most accomplished technology. In both ICT and security research, the civil liberties aspects are significant.

The integration of "soft sciences and approaches" (cf. social sciences and humanities and aspects related to science in society) and security research seems difficult, because the technological interests, although recognising the social issues and the constraints it imposes, still see commercial success as largely a function of technical performance. On “scientific support to research and innovation policies” the contributions of social sciences and technology are in fine balance, but leadership lies with social sciences because of the essentially political character of the work.

Many common threads ran across the sections. A common need for social sciences constantly to redefine and “challenge the challenges” was evident. Society changes and our understanding of it changes also. There is a need for interdisciplinarity and for new alliances between social sciences and humanities, natural sciences and technological developments.

The systems approach is common to both the innovation discussions, to security and to ICT. It is intrinsic to forward looking activities. The systems view seems close to displacing conventional, linear models across the community.

There is also a common perception of the need to tap into hidden resources in Europe; to use the resources of the public sector to stimulate innovation; to empower citizens as innovators in responsible research and innovation; to mobilise disadvantaged groups through e-inclusion and most importantly to recognise and use properly the skills of women in science, still so neglected. Recognition of the potential of these resources will modify our perceptions of the challenges and opportunities and improve our response to them. It helps us recognise and exploit the diversity in our societies as sources of new innovation trajectories.

Clear complementarities were visible between sessions; for example between social inclusion and e-inclusion or between democratisation as the motor of responsible research and innovation and the government side of digital societies. The nature of trust, what it is and how it is obtained, was a priority for both security research and ICT. The tension between connectivity and privacy was a recurring theme in inclusion, e-Government and security; the notion of privacy by design, its potential and limitations creates a link between
societal and technical ways to solve this problem. The irreversibility of some technological options is another interesting avenue of exploration by social sciences.

The necessity for hybrids solutions involving social sciences and humanity was common across all sessions and the benefit of embedding the social dimension into technical research from the outset was generally acknowledged as a priority especially concerning security and inclusion. Hybrids seem to have made least progress in security research. Measures to remove the origin of threats and to create within society the capacity to withstand threats might be included alongside technical solutions in an integrated security policy. Such measures would need to be based on scientific evidence and this should be sought in Horizon 2020.

The focus on societal challenges opens up a space for experimenting in novel ways. It is clear that we are facing new combinations of knowledge, social technological and organisational innovations. The possibilities of social innovation were common to most sessions, again with the exception of security. The move to a full-cycle approach to innovation gives a priority to demonstration and pilot projects that is common across the board.

But without “security”

There is clearly much to be said in favour of a direct, independent and substantial social science-led grand challenge which would require 5 billion € according to social sciences stakeholders (NET4SOCIETY).

Some themes appear to be rather convincingly integrated into a single challenge: research and innovation for inclusive societies; responsible research and innovation; scientific support to research and innovation policies; research and innovation for inclusive and trustworthy digital societies. In these areas there are many common elements and dense cross-linkages. “Research and innovation for secure societies” fits less comfortably into this scheme as was strongly argued by some stakeholders. In the second workshop, several Member States (Czech Republic, Germany, France, Italy, Spain and the United Kingdom) showed a clear preference to remove the security pillar from the "Inclusive, innovative and secure societies" challenge. Portugal and The Netherlands shared this opinion, but with some nuances. The national Security delegates particularly insisted to have an independent "Security challenge" with its own personality, but there was some support also from the Social Sciences and Humanities programme committee representatives. A title of a new challenge was suggested for this independent Security challenge: "Protecting the freedom of Europe and its citizens".

The main arguments adduced for this separation both at the stakeholder and Member States representatives workshops concerned: the artificial combination of activity areas ("arranged marriage"); the different stakeholders communities; the different demand and supply conditions; the specific confidentiality requirements and the different links with industry and academia.