ANNEX

to the

COMMISSION IMPLEMENTING DECISION of XXX

Key orientations for the Joint Research Centre’s multi-annual work programme for 2016-17

I. Introduction

In his ‘Political Guidelines’\(^1\) and ‘Letter of Intent’,\(^2\) the President of the European Commission, Jean-Claude Juncker, set out his agenda for jobs, growth, fairness and democratic change, focusing on 10 policy areas in which the European Union can make a real difference. The guidelines point out that: ‘Jobs, growth and investment will only return to Europe if we create the right regulatory environment.’ In view of this, the Commission introduced the ‘Better Regulation Agenda’ to improve the design of EU policies and laws so that they achieve their objectives at minimum cost. ‘Better regulation’ must be based on rigorously established, objective evidence. The JRC’s mission is to provide such evidence to Commission policymakers.

Horizon 2020 ‘indirect research’ (conducted in research centres, universities or companies, with financial support from the Commission) has a vital role to play in supporting policy. The JRC’s own research (known as ‘direct research’) also contributes to Horizon 2020. Direct research carried out by the JRC has a unique role to lay in the policymaking process. Since the JRC is a Commission service, its research is completely independent of any national, commercial or civil society interests. This is especially important in policy areas where the science may be controversial or in situations where a new policy could have a major impact on the economy. As a public service, the JRC is able to make its intellectual property (such as computer models) freely available in the interests of full transparency. The JRC is also able to ensure continuity in policy support over a number of years, rather than merely for the duration of a Commission-funded project. Finally, when the policy agenda changes, the JRC can respond more quickly to new priorities than researchers on an indirect research programme.

To support the Commission’s ambitious agenda set out by the Commission’s President, the JRC is intensifying its work on integrating evidence into policymaking at the Commission. In addition to providing knowledge, it is entering into closer dialogue with policy Directorates-General (DGs), responding to their questions, outlining the consequences of different policy choices, and identifying alternative policy options. The JRC will also work closely with the Commission’s new Scientific Advice Mechanism\(^3\) in pursuit of its complementary mission to provide the Commission with high quality, timely and independent scientific advice.

President Juncker has made it clear that he wants to ‘overcome silo mentalities and introduce a new collaborative way of working.’ As the JRC works across all policy areas, it will help identify synergies and trade-offs between policies. It will, in particular, aim to support the Commission’s work on ‘better regulation’. The JRC is involved in all stages of the policy cycle. Its work informs the design of new policy initiatives and legislative proposals but also underpins their implementation in close interaction with Member States, European stakeholders and international partners. This gives it a unique insight into how well policy

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\(^3\) In accordance with Commission Decision C(2015) 6946 of 16 October 2015. See also [https://ec.europa.eu/research/sam/index.cfm](https://ec.europa.eu/research/sam/index.cfm)
initiatives are working and whether improvements are needed. In other words, the JRC will contribute to both at ex ante and ex post work to improve the quality of regulation in the EU.

In support of the new Commission’s objective of improving the way it manages knowledge,4 the JRC will set up a number of pilot knowledge and competence centres in priority policy areas. The knowledge and competence centres will facilitate knowledge management across DGs and will put in place new collaborative working methods. **Knowledge centres** will create, collate, validate and structure internal and external scientific knowledge for a specific policy field or across policy fields. They will also put this knowledge into context and make it comparable and easily accessible. Pilots will be set up for territorial policies and disaster risk management in collaboration with the relevant DGs. **Competence centres** will bring together analytical expertise such as modelling or data mining which are independent of theme, and can be applied across policy areas. Competence centres in the areas of composite indicators, microeconomic evaluation and modelling will be set up.

**A work programme supporting the European Commission’s 10 priorities**

The key orientations for the JRC’s multi-annual work programme 2016-17 support the priorities set out by the Juncker Commission.

The JRC’s key orientations are:

- organised according to the 10 areas set out in the agenda for jobs, growth, fairness and democratic change;
- based on the Horizon 2020 work programme for 2016-17;
- funded either by institutional resources (i.e. operational funding for the JRC from Horizon 2020) or competitive resources (i.e. additional funding from policy DGs and grant funding from Horizon 2020).5 The JRC benefits from its participation in Horizon 2020 and its predecessor, FP7, not just financially, but primarily in terms of valuable access to European and international research networks;
- in line with the overall objective set out in Horizon 2020 for the JRC’s non-nuclear work, which is ‘to provide customer-driven scientific and technical support to EU policies, while flexibly responding to new policy demands’ and the general objectives of the Euratom programme relating to the JRC’s nuclear work, which are ‘to pursue nuclear research and training activities with an emphasis on continuous improvement of nuclear safety, security and radiation protection’.

The JRC provides support for all 10 points of Commission President’s Agenda for Jobs, Growth, Fairness and Democratic Change. In particular, it aims to contribute to the main areas of the Commission’s Work Programme for 2016,6 as set out below.

**A new boost for jobs, growth and investment**

The JRC will continue to develop its Smart Specialisation (S3) Platform to help regions make smarter and more targeted use of European Structural and Investment Funds7 (ESIFs). It will

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5 All projects indicated as COM-IA in the detailed work plan (accessible via the JRC Project Browser) are projects funded directly either by FP7 or Horizon 2020. These are collaborative projects where the JRC is one beneficiary among others.
add a monitoring function into the Platform to analyse whether funds have been allocated based on smart specialisation strategies and to assess the concrete results achieved. It will also expand the use of smart specialisation to other key EU policy programmes and initiatives, in particular energy policy, Horizon 2020, and the digitisation of industry. It will provide socioeconomic analysis on skills and determinants of employability, and will contribute to the assessment of policy programmes designed to help people into work.

The JRC has a long history of developing knowledge, processing data and creating models on EU countries, in particular regions and cities. This territorial intelligence and the JRC analytical models have underpinned the development, implementation and assessment of cohesion policy. They can also be used by the key partners in the Commission. The JRC, in collaboration with DG REGIO, is setting up a pilot Knowledge Centre for Territorial Policies. Its main objective will be to facilitate place-based policy development and investments prioritisation to make the most of each territory’s growth potential.

A connected digital single market

The JRC will analyse the key issues and barriers linked to the digital single market. It will also identify and analyse security and privacy issues relating to the new and emerging technologies that are driving the digital single market (such as wireless communications, mobile applications, digital identities and electronic currencies). The JRC will develop tools to enable consumers to assess the data protection and privacy of digital services and understand the data protection and privacy implications (both direct and indirect) of new technologies (such as cloud storage, smart sensor technology and video drones). The JRC will support the implementation of interoperability solutions and the use of ICT infrastructures to address emerging challenges in big data.

A resilient European Energy Union with a forward-looking climate change policy

The JRC will further develop its knowledge management activities to improve the availability of data and analysis on specific topics under the Energy Union, as set out in the Energy Union Communication (e.g. alternative fuels, energy efficiency, low carbon energy technologies). At the heart of this will be a substantial knowledge base featuring a range of analytical tools and models across the five dimensions of Energy Union. Over time, data from other stakeholders will be added to this knowledge base, along with new knowledge needed for specific actions under the Energy Union Roadmap. Another key part of the JRC’s 2016-17 work programme will be the further development of the energy modelling toolbox.

The JRC will continue to provide technical and scientific support for developing, implementing and monitoring EU policies on nuclear safety and security and radiation protection (including education, training and information), while taking related EU strategies into consideration (e.g. the Energy Security Strategy\(^7\)). The JRC will continue to support the development and consolidation of various European Technology Platforms, including the Sustainable Nuclear Energy Technology Platform (SNE-TP), the Implementing Geological Disposal of Radioactive Waste Technology Platform (IGD-TP), or the European Nuclear Energy Forum.

A deeper and fairer internal market with a strengthened industrial base

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The JRC’s extensive expertise in standardisation will continue to support the internal market. It will also use its in-depth knowledge of Europe’s industrial landscape to contribute to regulatory fitness checks for different industrial sectors and a framework for measuring European competitiveness across Member States and industries. The JRC will build on its Industrial Landscape Vision 2025\(^9\) to develop, together with industry stakeholders, a methodology for designing forward-looking industrial policies based on an assessment of the challenges and needs of the manufacturing industries. The JRC will also continue supporting: the circular economy initiative (notably on raw materials and bioeconomy); space policy, (notably Copernicus and Galileo); vehicle emissions; medical devices; and alternatives to animal testing.

**A deeper and fairer economic and monetary union**

The JRC will contribute to the development of a system for assessing the social impact of financial measures. It already supports monitoring of Member States’ economies and fiscal policies as part of the European Semester, in particular detecting potential imbalances and evaluating their effects on the EU economy as well as checking Member State's compliance with Stability and Growth Pact, and drafting in depth tax analysis. It will strengthen this by: creating a reference network for policy-oriented research on economic and financial matters; developing a new multi-country model; and extending its taxation modelling activities. It will assess the potential effects of corporate tax reforms in the EU. It will carry out more detailed analysis of how debt bias in the banking sector, created by the different tax treatment of debt and equity, affects financial stability, and how new taxes in the banking sector could reduce systemic risk. To support the development of a capital markets union, the JRC will collect and publish information about different approaches across Member States to corporate and household bankruptcy, debt restructuring and credit assessment.

**Towards a new policy for migration**

The Commission’s European Agenda on Migration\(^10\) outlines an immediate response to the crisis situation and sets out a longer-term approach to manage migration, including relocating asylum seekers, securing external borders, attracting highly skilled migrants, and identifying the root causes of migration. To help with this, the JRC will integrate more closely its activities established to support migration policies, and assess any gaps in evidence where the JRC could provide added value. Current and future JRC activities include: detecting vessels and enhancing situational awareness in order to track boats used by people smugglers; developing IT systems to manage borders and legal migration; and identifying the push and pull factors of migration, including also longer-term drivers such as environmental pressures and climate change.


II. Key orientations for support to EU policies

The key orientations for the JRC’s multi-annual work programme 2016-17 are structured according to the 10 policy areas set out in the Commission’s agenda for jobs, growth, fairness and democratic change. The way in which the key orientations contribute to Horizon 2020 indirect research is specified at the end of each section.

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1 A new boost for jobs, growth and investment

1.1 Agriculture and rural development

There are some 11 million farmers in the EU, and another four million people work in the food sector.\textsuperscript{11} Together, the farming and agri-food industries provide 44 million jobs and account for 6\% of the EU’s GDP.\textsuperscript{12} Average household expenditure on food is around 13\% of monthly income, but this percentage varies considerably between Member States. The EU (together with the US) is the leading exporter of agricultural products (mostly processed and high value-added products) and the single leading importer from developing countries, with average annual imports of €60 billion.\textsuperscript{13} Global food security is a great concern, with an estimated 805 million undernourished people in the world.\textsuperscript{14} At the same time, it is estimated that around 30\% of all food produced is wasted (throughout the entire supply chain, including both producers and consumers).\textsuperscript{15}

Relevant Commission policy objectives:

- promote viable food production, with a focus on agricultural income, agricultural productivity and price stability;
- promote the sustainable management of natural resources, and climate initiatives, with a focus on greenhouse gas emissions, biodiversity, soil and water;
- promote balanced territorial development, with a focus on rural employment, growth and poverty in rural areas.

Key orientations for the JRC:

a) \textbf{Common Agricultural Policy (CAP) implementation} – efficient and innovative tools for CAP implementation.

b) \textbf{CAP design, monitoring and evaluation} – methods and tools for an integrated assessment of agriculture, rural development and the environment at farm and regional level (to allow CAP instruments to be tailored to environmental needs).

c) \textbf{Resource efficiency and climate change} – model soil, water and ecosystem dynamics in order to improve their sustainable management in agricultural systems. Study the effects of climate change on the agricultural sector, assess the potential of climate change mitigation and adaptation strategies.

d) \textbf{Agricultural market, trade & food security} – economic analysis of the competitiveness of the European agri-food sector, the performance of European agri-food systems (including the food chain), and their contribution to global food security.

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\textsuperscript{11} Eurostat, \textit{Farm Structure Survey}, 2010.
\textsuperscript{12} DG AGRI Management Plan 2015.
\textsuperscript{13} DG AGRI.
\textsuperscript{14} Food and Agriculture Organization of the United Nations (FAO), \textit{The State of Food Insecurity in the World}, 2015.
\textsuperscript{15} DG SANCO.
1.2 Education, culture, youth and sport

European education and training systems face the challenge of ensuring equal access to high-quality education, in particular by reaching out to the most disadvantaged and integrating people with diverse backgrounds, including adequately integrating newly arrived migrants into the learning environment, thereby fostering upwards social convergence. The Commission’s 2015 Education and Training Monitor shows that serious challenges remain. For example one in four adults in Europe is caught in a low-skills trap – one that limits access to the labour market while simultaneously closing avenues to further education or training. Only 4.4% of the 66 million adults with at best lower secondary education attainment participate in adult learning. Higher education attainment continues to improve and now stands at 37.9% but the employability of graduates remains stagnant across the EU.

The cultural and creative sectors in the EU account for 4.5% of GDP and 3.8% of total employment. Cultural and creative sectors initiatives have not only shown exceptional resilience to the economic crisis, but are also well-placed to grow further in the future due to their role as forerunners in digital innovation and source of entrepreneurship.

Relevant Commission policy objectives:

In November 2015, new priority areas for cooperation with the Member States in addition to the EU2020 common objectives were adopted, among which are:

- Relevant and high-quality knowledge, skills and competences developed throughout lifelong learning, focusing on learning outcomes for employability, innovation, active citizenship and well-being;
- Inclusive education, equality, equity, non-discrimination and the promotion of civic competences;
- Open and innovative education and training, including by fully embracing the digital era;
- Transparency and recognition of skills and qualifications to facilitate learning and labour mobility;
- Sustainable investment, quality and efficiency of education and training systems;
- Create more and equal access to education and employment for all young people and promote active citizenship, social inclusion and solidarity among them;

Regarding cultural and creative sectors, the key policy priorities are:

- Improve understanding of the economic potential of cultural and creative sectors in terms of growth, job creation and social effects;
- Promote culture as a catalyst for innovation, by maximising the sector's contribution to jobs and growth, particularly among the young, and our cultural diversity.

Key Orientations for the JRC:

a) Help monitor trends in education and training systems under EU policy strategies (e.g. Europe 2020 and the strategic framework for European cooperation in education and

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16 The percentage of those aged 30 to 34 who have successfully completed tertiary level education (Eurostat).
17 Making lifelong learning and mobility a reality; improving the quality and efficiency of education and training; promoting equity, social cohesion, and active citizenship; enhancing creativity and innovation, including entrepreneurship at all levels of education and training.
training, ET 2020); carry out research and analysis on education and training systems (e.g. on efficiency and equity in education investment, relevance for regional development and smart specialisation, education and societal wellbeing; integrating vulnerable groups such as migrants, refugees and other minorities through the education system and early childhood learning; the impact of digitisation on education and training practices; and key contribution of open and innovative education systems to fully embracing the digital era).  

b) Contribute to the successful implementation of the ET2020 strategic framework for European cooperation in education and training and to the achievement of its objectives through evidence building actions.

c) Develop evaluation tools to measure and monitor cultural activities and creativity at city level to assess the impact of specific culture-oriented initiatives on the economic and social development.

1.3 Environment

Today in the EU, each person consumes an average of 16 tonnes of materials per year, of which six tonnes per year are wasted, with half going to landfill Only 17% of habitats and species protected under EU legislation are in a favourable state, and only about half of the EU’s surface waters are expected to be in a good ecological status in 2015. Marine biodiversity remains insufficiently assessed at the EU level, but is showing patterns of degradation across all regional seas. A substantial proportion of the EU’s population remains exposed to levels of air pollution exceeding the standards recommended by the World Health Organisation. Meeting these environmental and resource-efficiency challenges, as highlighted in the 7th EU environmental action programme, would bring socioeconomic benefits in terms of human health and wellbeing, adaptation to climate change, and opportunities to innovate and to create jobs. The global dimension of many environmental challenges means that the EU has a strong interest in cooperating with international partners as part of the follow-up to the Rio+20 summit.

Relevant Commission policy objectives:

- Enable EU citizens to live well, within the planet’s ecological limits, in an innovative, circular economy where biodiversity is protected, valued and restored and environment-related health risks are minimised in ways that enhance our society’s resilience, and where growth has been decoupled from resource use.

Key orientations for the JRC:

1.3.1 Protecting and enhancing our natural capital

a) Freshwaters and the marine environment. Assessment of water resources and water use efficiency, floods and droughts, the monitoring of water chemical, biological and ecological quality, and nutrient cycles, and hydro-economic modelling for the Water
Framework Directive and related directives. Develop standards and reference materials for water pollutants for all freshwaters and marine waters. Develop minimum quality requirements for water reuse (also contributing to the circular economy – see 1.3.2.a). Develop the knowledge base on oceans and coastal environments, in particular for the Marine Strategy Framework Directive, including by developing the JRC’s marine modelling framework.

b) **Biodiversity, forests and soils.** Support the implementation of the EU Biodiversity Strategy, notably on the assessment of ecosystem services and natural capital accounting, the green infrastructure, the invasive alien species information system, and global biodiversity monitoring. Analyse and model forest resources and develop information systems on forests and forest fires in support of the EU Forest Strategy. Provide support to the EU Soil Thematic Strategy by modelling soil functions and developing the European Soil Data Centre (ESDAC). Monitor and model land and soil degradation and desertification, including for the Global Soil Partnership.

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**Horizon 2020 indirect research**

Key orientation (a) contributes to the focus area ‘Blue growth’.

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**1.3.2 A circular, green and competitive low carbon economy**

a) **Sustainable consumption and production and the circular economy.** Develop methodologies and life-cycle data for sustainable consumption and production policies, including the assessment of circular economy aspects such as reparability, durability, and recyclability, and the environmental footprint of products and organisations. Develop criteria and measures for the implementation of product policy instruments and facilitate information exchange on best practice. Determine best available techniques and develop indicators for waste management, and assess how to optimise energy recovery from waste. Support the management of the EU raw materials knowledge base (see also KO 4.1.a) and develop quality criteria for secondary raw materials. Support the eco-innovation action plan, in particular the environmental technology verification programme.

a) **Environmental information and indicators.** Develop environmental indicators in support of the roadmap to a resource-efficient Europe, the GDP-and-beyond roadmap and the integration of environment into other policies. Implement the infrastructure for spatial information in the European Community (INSPIRE) and the shared environmental information system.

b) **Policy impacts on sustainability and competitiveness.** Carry out integrated sustainability assessments and impact assessments of EU policies based on land-use modelling and on life cycle thinking. Analyse the impact of environment policies on industrial competitiveness.

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**Horizon 2020 indirect research**

Key orientation (a) contributes to the focus area ‘Industry 2020 in the circular economy’

Key orientations (a), (b) and (c) contribute to the focus areas ‘Energy efficiency’ and ‘Competitive low carbon energy’.

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1.3.3 **Protection from environment-related risks to human health and wellbeing**

a) **Chemicals and nanomaterials.** Implement the chemicals legislation and support policy development in cross-cutting areas. Set up a toxicology knowledge base and an information platform for chemical monitoring, and support mutual acceptance of chemicals data at international level (e.g. at OECD). Develop and promote alternatives to animal testing. Develop methodologies, standards (e.g. at CEN/ISO) and reference materials for nanomaterials (also see key orientation 4.1), and support information generation and dissemination.

b) **Air quality, pollutant emissions and industrial accident prevention.** Monitor and model ambient air quality and air emissions (for vehicle emissions see also key orientation 4.1.a). Carry out integrated impact assessments of air quality and climate policies. Support the implementation of EU air policies through quality programmes and the validation of innovative methods. Determine best available techniques for implementing the Industrial Emissions Directive. Develop information systems on, and carry out analyses of, industrial accidents.

1.4 **Maritime affairs and fisheries**

Seafood products represent almost 20% of total global consumption of animal protein. The EU is the world’s third largest seafood producer. The maritime sector employs some 5.4 million people across Europe, in sectors as diverse as shipbuilding, tourism and the offshore, and could potentially employ 7 million by 2020.21

This policy aims to develop the potential of the European maritime economy and to secure sustainable fisheries, a stable supply of seafood, healthy seas and prosperous coastal communities. Actions involve promoting an integrated approach to all maritime policies and implementing the reformed common fisheries policy (CFP) and integrated maritime policy (IMP). The latter provides for increased coordination between different policy areas, such as blue growth, marine data and knowledge, maritime spatial planning, integrated maritime surveillance, marine environment, and sea basin strategies. It also points to the need to develop synergies between fish stock and ecosystem modelling activities in the context of fisheries and environment policies.

The IMP also supports reducing EU fishing fleet capacity by focusing on conserving and renewing fish stocks and on diversification, innovation and sustainable techniques. There is zero tolerance of unlawful fishing, and alternatives to discarding are being developed.22

**Relevant Commission policy objectives:**
- foster implementation of the EU’s IMP in a way that complements cohesion policy and the CFP;
- foster implementation of the CFP by promoting sustainable and competitive fisheries and aquaculture, and developing synergies between fish stock and ecosystem modelling;
- advance ocean governance internationally and develop the EU’s maritime economy to promote jobs and growth;

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- step up the fight against unlawful unreported and unregulated fishing through an effective EU fisheries control system and a suitable data collection framework;
- contribute to the long-term sustainability of fisheries worldwide through active involvement in international organisations and by concluding sustainable fisheries partnership agreements with non-EU countries.

**Key orientations for the JRC:**

a) develop and apply biological, economic, social, spatial and genetic/genomic approaches to sustainable and competitive aquaculture and fisheries, in the EU and worldwide;

b) develop marine knowledge for maritime spatial planning and coastal management, and the relevant knowledge management tools (EU’s ‘atlas of the seas’ and Marine Competence Centre);

c) improve EU maritime surveillance systems, and enhance their interoperability and provide support to implement selected actions from the EU Maritime Security Strategy.

### Horizon 2020 indirect research

Key orientations (a) to (c) contribute to the focus area ‘Blue growth’.

### 1.5 Health and food safety

#### 1.5.1 Health

It is important to promote the health of European citizens, not only to prevent unnecessary suffering, but as part of the strategy to increase the employment rate among people aged 20 to 64 to 75% and reduce the number of people retiring early owing to illness. Health expenditure is the second largest general government expenditure item in the EU (accounting for 14.8% of total government expenditure in 2013) and health budgets are expected to come under increased pressure from Europe’s ageing population.

**Relevant Commission policy objectives:**

- improve and protect human health, reduce health inequalities, support health systems reform, and fight discrimination;
- prevent disease and promote good health in an ageing Europe using appropriate measures.
- protect European citizens from a range of cross-border health threats and ensure a fully coordinated response in the event of a crisis;
- support the development of innovative and sustainable healthcare systems and new technologies in the EU;
- develop country knowledge, reference knowledge-translation publications, and evidence-based policy briefs.

**Key orientations for the JRC:**

a) Contribution to the standardisation and improvement of health research, information, monitoring and measurements in support of evidence-based policy making. Harmonisation and development of quality healthcare management frameworks and new analytical methods;
b) development of European health registry data and a Bioinformatics Platform for human ‘omics’ data;

c) promotion of a healthier society, including actions in the field of physical activity, nutrition (diet, alcohol) science and health technologies.

1.5.2 Food safety

In 2014, 3,157 original notifications related to non-compliance with EU food legislation were sent through the EU’s rapid alert system for food and feed.

Relevant Commission policy objectives:

- reinforce safety in the food chain and ensure appropriate and transparent information about the origin, content and use of foods is provided;
- ensure a high level of animal health and welfare, and of plant health protection.
- contribute to the development of a Food Research Area for Food and Nutrition Security Research and Innovation in Europe and in a Global context

Key orientations for the JRC:

a) run the six EU reference laboratories, produce certified reference materials, develop harmonised/validated methods and new analytical tools;

b) collect data and carry out analysis in support of evidence-based policy making and develop exposure assessment methods; fight against food fraud and provide support for impact assessments.

### Horizon 2020 indirect research

Key orientations 1.5.1 c) and 1.5.2 a) and b) contribute to the development of the Food Research Area

1.6 Regional policy

Cohesion policy investments in EU Member States and regions are particularly significant and are increasingly important to achieve the Europe 2020 strategy agenda and the Investment Plan for Europe priorities. The policy is an integral part of European economic governance, contributes to the European Semester process and is an important driver for the real economy and is a boost for the exiting the crisis. Some €340 billion\(^{23}\) has been earmarked for investments in economic, social and territorial cohesion for the period 2014-2020.\(^{24}\)

Relevant Commission policy objectives:\(^{25}\)

- strengthen economic, social and territorial cohesion by reducing disparities between the levels of development of regions and countries of the EU;
- strengthen performance of EU investments and space-based policy development;
- develop strengthened cooperation with third countries through macro-regional strategies;

\(^{23}\) Regional policy, Cohesion policy data 2014-2020.


\(^{25}\) DG REGIO mission.
- coordinate urban policies.

**Key orientations for the JRC:**

a) **Territorial impact assessment of policies and investments.** Developing an integrated modelling capacity that would make it possible to better assess the impact of investment and policies in regions and cities. These models provide information on the various sectoral and multi-sectoral challenges and enable sketching alternative options and scenarios to be evaluated by policymakers and to contribute to the Europe 2020 targets and the European Semester process.

b) **Indices and quantitative analysis measuring economic, social and territorial cohesion at urban and regional level.** Analysis – at urban, regional and macro-regional level – of environmental sustainability and improvement of public health and wellbeing, including: ecosystem services; air and water quality; natural hazards and resource efficiency. This includes transport analysis in and between cities and between regions.

c) **Support for smart specialisation strategies.** Integrated processes and methods to support the development, implementation and monitoring of smart specialisation strategies at national, regional and macro-regional level, including for energy, global value added, higher education and lagging regions.

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### 1.7 Research, science and innovation

Achieving the target of spending 3% of EU GDP on R&D by 2020 could create 3.7 million jobs and increase annual GDP by around €800 billion by 2025. Research and innovation policy is critical to ensuring Europe’s competitiveness in the globalised economy, and to ensure people’s wellbeing.

**Relevant Commission policy objectives:**

- reinforce and extend the excellence of the Union's science base and to consolidate the ERA in order to make the Union's research and innovation system more competitive on a global scale;
- speed up development of technologies and innovations that will underpin tomorrow's businesses and help innovative European SMEs to grow into world-leading companies;
- strengthen the EU’s scientific and technological bases by better exploring the potential of innovation, research and technological developments;

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26. *With the objective to address common challenges faced by a defined geographical area relating to Member States and third countries which thereby benefit from strengthened cooperation, the European Council endorsed Macro-regional strategies for the Baltic Sea Region, Danube Region, Alpine Region and Ionic-Adriatic Region.*

27. *Idem.*

- transform the EU into a knowledge-based economy with an innovation-friendly business environment, and improve the framework conditions for research and innovation;
- mobilise and coordinate research and innovation efforts to tackle major social challenges and support policymaking;
- pool regional, national and European resources and expertise, and contribute to the implementation of a genuine European Research Area as well as promote synergies with Cohesion Policy to ensure a higher impact of research and innovation investments;
- provide European policymakers and stakeholders with world-class data and analysis on research and innovation at country and policy level for EU Member States as well as key strategic partners and associated countries to Horizon 2020.

Key Orientations for the JRC:

The JRC contributes to the Commission’s objectives through its own work, as a partner in FP7 or Horizon 2020 projects, or by using research from framework programmes:

a) **Modelling, monitoring and analysis** of the drivers of and socioeconomic barriers to research and innovation. Analysis and ex ante assessment of socioeconomic impact and effectiveness of policy instruments related to research and innovation at EU, Member State and regional level, as well as (cross-)sectoral level. Research and Innovation Observatory for the collection, production and dissemination of data and analysis related to national research and innovation policies, including thematic research and innovation policies, to feed into country monitoring in the European Semester. Indicators, scoreboards, information systems and web platforms for monitoring and analysing progress in the implementation of the Innovation Union and the European Research Area for Member States and key strategic partners. Foresight support for the identification of research and innovation priorities; application of horizon-scanning techniques and dissemination of findings.

b) Programme and project level support for **fuel cells and hydrogen** technologies under the Fuel Cells and Hydrogen 2 Joint Undertaking, typically in areas where cross-cutting is possible, such as safety regulations, codes and standards.

c) Development of a **low carbon energy observatory**, providing data, analysis and intelligence on the state of the art of different energy supply technologies, their industrial development, market barriers and global competition.

d) Data collection, analysis, dissemination and modelling on the progress of the bioeconomy, through the **Bioeconomy Observatory**, and assessment of sustainable biomass supply and demand at EU and global scale.

e) Promotion of collaboration on **intellectual property rights** and technology.

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29 India, China, Russia, Japan, Mexico, USA, Brazil and Korea
30 Albania, Bosnia & Herzegovina, The former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey, Iceland, Norway, Faroe Islands, Israel, Moldova, Switzerland, Ukraine
Horizon 2020 indirect research

Key orientation (b), (c) and (d) contribute to the focus area ‘Competitive low carbon energy.’

1.8 Transport

The transport industry directly employs more than 10 million people, accounting for 5.1% of total employment, and represents 5% of European Gross Value Added. About 13% of every household’s budget is spent on transport. Transport in the EU has become more energy efficient, but still depends on oil and oil products for 94% of its energy needs. It is responsible for 30% of GHG emissions. In 2013, more than 24,000 new electric vehicles were registered in the EU.

Relevant Commission policy objectives:

- ensure that greenhouse gas emissions reductions in the transport sector contribute to the achievement of EU targets; improve the sustainability of the EU’s growth model;
- promote the efficient functioning of Europe’s infrastructure to help develop the internal market;
- support optimal connectivity across different transport modes to make travel easier for people;
- develop harmonised standards for safety and security.

Key orientations for the JRC:

a) transport innovation – support the strategic transport innovation agenda and develop the transport innovation and monitoring information system;

b) alternative fuels – carry out pre-normative testing and contribute to development of standards supporting the implementation of the alternative fuels infrastructure in the frame of an Alternative Fuels Knowledge Centre; modelling of and support for electromobility standardisation;

c) transport policy analysis – socioeconomic analysis of the transport sector, using transport models, quantitative methodologies, data, scenarios, and technology watching; harmonise transport data with spatial and environmental information;

d) intelligent transport systems and electronic tools – technical support for the implementation of the ‘digital tachograph’, in particular the preparation of new technical specifications; support for the development of cooperative intelligent transport systems; development of electronic tools in support of quality inland water transport across Europe;

e) safety and security – development of tools and databases on EU-wide multimodal accidents and incidents, as well as data visualisation and exploration tools for transport safety analysis, including the design of a concept for using big data for aviation safety; carry out performance testing and analysis of aviation security technologies.

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31 Mission Letter – Commissioner for Transport:
**Horizon 2020 indirect research**

Key orientations a) to e) contribute to Societal Challenge 4 "Smart, Green and Integrated transport". Key orientations a) and d) contribute to the focus area "Competitive low-carbon economy" and c) contributes in addition to "Automated road transport".

### 1.9 Employment, social affairs, skills and labour mobility

Although unemployment in the EU-28 has fallen slightly compared with 2014 figures, it nevertheless stood at 9.5% in August 2015. Unemployment levels are much higher among young people, low-skilled workers and third-country nationals. For example, in August 2015, the youth unemployment rate was 20.4% in the EU-28. There are more than 12 million people who have been unemployed for over a year. Despite the economic recovery and signs of improvements in the EU labour market, their number doubled between 2007 and 2014, accounting for about half of the total number of unemployed. Worryingly, too, 24.5% of the EU-28 population was deemed at risk of poverty and social exclusion in 2013. Inequalities continue to grow, with the top 20% earning more than five times the income of the bottom 20%. One in five adults in the EU today do not have sufficient literacy levels to cope with the daily requirements of personal, social, and economic life. This situation needs to be tackled in order to create a fair and inclusive society.

**Relevant Commission policy objectives:**

- Promote dynamic, inclusive and resilient labour markets in Member States and tackle youth unemployment.
- Reinforce the coordination and monitoring of employment policies at EU level in line with EU economic governance and improve cross-sectoral cooperation.
- Contribute to the growth and investment package and funding initiatives that support access to the labour market, in particular by promoting vocational training and lifelong learning to strengthen skills.
- Step up the struggle against inequality and poverty.
- Promote a social investment approach in the modernisation of social policies and social protection systems.

**Key Orientations for the JRC:**

a) Provide technical advice, methodological support, specialised training and exchange on counterfactual impact evaluations; macroeconomic analysis to assess the social return on investment approaches in the context of employment and social policy interventions (e.g. the European Social Fund and the Social Investment Package);

b) Provide robust knowledge on both the distribution and evolution of skills and their links with employability, and on the impact of digitalisation on labour markets.

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35 [Speech by Marianne Thyssen, Commissioner for Employment, Social Affairs, Skills and Labour Mobility at the 'Act now! Literacy makes Europe work' event on 17 September 2015.](https://ec.europa.eu/employment-equality/timely-literate-society_en)
c) Provide assessment studies, technical and scientific support in the area of protection of workers' health from possible risks arising from exposure to hazardous chemicals at the workplace, e.g. carcinogens.

2 A connected digital single market

2.1 Digital economy and society

Between 2001 and 2011, ICT accounted for 30% of GDP growth in the EU. However, in the US, ICT accounted for 55% of GDP growth over the same period. There are already seven million ICT-related jobs in the EU. Uptake of cloud computing solutions could bring savings of €2 000 per citizen over five years; implementing e-procurement could save €100 billion a year. ICT innovations reduce the carbon footprint both of ICT and of other sectors, and offer opportunities for modernising public services. Yet obstacles remain. Age, disability, gender and education present obstacles to securing internet skills and to usage. 74% of EU businesses have no regularly-reviewed ICT security policy, 12% of internet users have experienced online fraud, with 8% falling victim to identity theft.36

Relevant Commission policy objectives:

- create a European Digital Economy and Society with long-term growth potential;
- ensure better access for all consumers, taking into account age, disability and gender, and businesses to digital goods and services;
- create an environment in which digital networks and services flourish.

Key orientations for the JRC:

a) Analyse relating to: ICT-led innovations, the impact of digital technology on growth, jobs and consumer welfare in the EU, with a particular focus on policy priorities related to the EU digital single market and the digital agenda for Europe and the implementation of roaming legislation. Support EU regions and Member States in developing better digital growth strategies co-funded by EU cohesion policy.

b) Develop IT tools and methodologies to analyse the radio spectrum inventory, and further develop technical expertise to support EU radio spectrum policy. Provide technical support relating to: the interoperability of e-infrastructures (supporting the digital European Research Area) and open access (supporting open science); make use of the convergence of big data with online tools (supporting citizen science), and assess the interoperability of energy services (in support of smart grids). Carry out analysis to develop policy options in the areas of cybersecurity, quantum technologies, ICT security, data protection and privacy issues, and to strengthen the information base on counterfeiting.

Horizon 2020 indirect research

Key orientation (a) contributes to the focus area ‘Smart cities and communities’.

Key orientation (b) contributes to the focus area ‘Competitive low carbon energy’.

36 DG CNECT.
Both key orientations contribute to the focus areas ‘Internet of things’ and ‘Digital security’.

3 A resilient Energy Union with a forward-looking climate change policy

3.1 Climate action

Domestically, the EU’s climate policy is aimed at encouraging the transition towards a low carbon and climate-resilient economy in the EU to help slow down global warming, support the recovery of the ozone layer, and mainstream climate policy into other EU policies and programmes. Internationally, and after the UN conference on climate change in Paris in December 2015, the EU will continue to drive the process forward to secure ambitious coordinated climate action with its international partners.

The European Council’s agreement in October 2014 on the ‘2030 Climate and Energy Framework’ set specific targets and confirmed the core structure of the EU’s climate and energy policy up to 2030. This now features as an integral building block of the Energy Union Strategy adopted by the European Commission in February 2015, with specific policy and legislative proposals scheduled to be adopted over the course of the next few years.

In 2016-2017 the JRC will support the development of new policy and legislative proposals and continue to implement existing legislation.

Relevant Commission policy objectives:

- develop legislation on greenhouse gas emissions in non-ETS sectors (including the integration of land use and the forestry sector into the mitigation framework);
- develop a comprehensive view for decarbonising road transport;
- develop a new renewable energy package;
- implement existing legislation and prepare to implement future legislation.

Key orientations for the JRC:

3.1.1 Climate policy development and implementation

a) Delivering greenhouse gas emissions reductions – monitoring, reporting and verification of energy-related, product-related, agricultural and forestry emissions to meet legal obligations at EU and UNFCCC\textsuperscript{37}/international level; modelling and other analyses on how to integrate these emissions into the 2030 climate and energy legislative framework. Compiling global emissions inventories.

b) Economic and climate modelling/assessments in support of (long-term) low carbon and climate-resilient sustainable development (mitigation and adaptation policy) – assess climate change impacts, vulnerability, adaptation and mitigation policy options in the EU and globally; further develop in-house capacity to carry out such assessments.

c) Earth system’s science – advance understanding of how the climate system interacts with other parts of the Earth’s system (e.g. ice and forests) and translate the findings into policy guidelines.

\textsuperscript{37} United Nations Framework Convention on Climate Change
Horizon 2020 indirect research

Key orientations (a) and (b) contribute to the focus area ‘areas "Competitive low carbon energy’ and "Climate services and decarbonisation".

3.1.2 Low carbon technologies

a) Vehicle emissions – technical support for implementing and developing policy measures addressing short and long-term objectives for the decarbonisation of the transport sector, specifically, analysing the real-world fuel consumption and CO₂ emissions of light- and heavy-duty road vehicles. Support the assessment of eco-innovation CO₂ savings and derogations for small-volume manufacturers of cars and vans, and niche manufacturers of cars.

b) Alternative fuels for transport – assess the environmental sustainability, technological development and costs of bioenergy and biofuels and of associated greenhouse gas emissions savings.

c) NEW ENTRANTS RESERVE (NER 300) – technical support for the knowledge sharing facility of the NER 300 funding programme.

Horizon 2020 indirect research

Key orientations (a) to (c) contribute to the focus area ‘areas "Competitive, low carbon energy’ and "Climate services and decarbonisation".

3.2 Energy

The EU’s energy policy aims at promoting the energy transition towards a competitive low carbon economy and at ensuring affordable, secure and sustainable energy for businesses and households. In 2014 the EU has adopted ambitious 2030 energy and climate targets to ensure, and monitor progress towards, this long-term transition, while it expressed the ambition to become world's number one in renewables.

The State of the Energy Union report, published in November 2015, confirms that the EU has made much progress in all 5 dimensions of the energy union, but at the same time it stresses the need for new policy initiatives to ensure that the 2030 objectives are met. Moreover, the EU is vulnerable to energy supply shortages because of its high overall energy import dependency (it imports about 53% of its fossil fuel needs) and the lack of adequate storage and transmission infrastructure across Member States. The need for a fully-integrated internal energy market justifies new legislative initiatives, such as the new market design and the new deal for consumers.

Relevant Commission policy objectives:

- Enhance security of electricity and gas supply through new and revised legislation, considering also the benefits of gas storage, and taking security into account in financing of infrastructure projects;

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38 DG ENER management plan 2015
- Promote a fully integrated internal energy market with a new deal for consumers;
- Develop a new renewable energy package and a new energy efficiency package to ensure achievement of the 2030 energy and climate targets;
- Monitor progress towards the Energy Union through national energy and climate plans and key indicators, addressing also the research and innovation dimension.

Key orientations for the JRC:

a) **Energy-climate-economy modelling** – develop, validate, and run models for climate-energy-economy modelling; provide support for impact assessments and particular scenarios; develop the capacity to contribute to the design of the energy-climate reference scenario.

b) **Energy security** – carry out security, safety, risk and techno-economic assessments of the EU’s energy supply from conventional and unconventional resources (oil, natural gas). This includes the security of supply, transmission and distribution of gas and of electricity, as well as the safety of offshore oil and gas installations. Analyse privacy and cybersecurity in the energy sector.

c) **Internal energy market**: assess the development of energy infrastructure and energy markets in the EU, including design of the retail market, new deal for energy consumers, integration of LNG and gas storage, super power grids, flexibility requirements and gas networks; develop methodologies for monetization of energy security in the evaluation of energy infrastructure projects, including Projects of Common Interest (PCI).

d) **Energy efficiency** – analyse the development and deployment of energy efficiency technologies; support the implementation of the Energy Efficiency Directive’s provisions on efficient heating, cooling and electricity; support the Covenant of Mayors on energy efficiency; analyse smart power grids (including interoperability and smart-metering), including with modelling tools and cost-benefit analysis.

e) **Low carbon energy technologies** – carry out techno-economic assessments of renewable energy technologies; support the implementation of the carbon capture and storage directive and analyse the potential for re-use of CO₂; carry out energy modelling and analysis of energy demand, supply and consumption scenarios at national, regional and pan-European level.

f) **Research & innovation** – Support the implementation of the integrated SET Plan through a strengthened information system (SETIS). Develop indicators that monitor the progress of energy technology innovation as an input to the annual State of the Energy Union report. Carry out relevant techno-economic analysis and energy systems modelling.

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3.3 Safe, secure and sustainable use of the nuclear energy
Electricity produced from nuclear power plants constitutes a reliable base-load supply of emission-free electricity and plays an important role in energy security (see the European Energy Security Strategy)\textsuperscript{40}. In the Energy Roadmap 2050, the Commission has committed itself to further developing the nuclear safety and security framework. The roadmap highlights that the highest safety and security standards need to be further ensured in the EU and globally, which can only happen if competence and technology leadership is maintained within the EU. This point was underlined in the recent Energy Union strategy.

The EURATOM Research and Training Programme 2014-2018\textsuperscript{41} is establishing objectives and funding activities in nuclear fusion and nuclear fission. The EURATOM Programme is implemented through direct actions (research performed by the JRC) and indirect actions (via competitive calls for proposals managed by DG RTD).

The JRC's research focuses on supporting safe, secure and responsible solutions for the operation of nuclear systems, the management and disposal of radioactive waste, nuclear decommissioning, environmental monitoring, emergency preparedness and nuclear competences.\textsuperscript{42} JRC participates also in indirect action, being currently present in 9 running projects (out of 23) with funding of about 2 Mio EUR.

The Euratom Treaty defines and requires the implementation of a strict system of safeguards throughout the EU to ensure that nuclear materials are used only for declared, peaceful purposes. Additionally the European Commission implements three safeguards agreements, covering obligations of all EU member states under the Non Proliferation Treaty, as well as EURATOM cooperation agreement with third countries. Support to mainly DG ENER, but also to other Commission services, in this respect will be provided by the JRC.

Additional driver is the Regulation (EU) No 1025/2012 on European standardisation\textsuperscript{43} and associated Annual Union Work Programme for European Standardisation\textsuperscript{44} where the JRC has a crucial role to play in standardisation by providing scientific input in its areas of expertise. The amended Euratom Nuclear Safety Directive of 2014\textsuperscript{45} highlighted the need for maintaining appropriate expertise in the nuclear field. The JRC contributes by monitoring and developing knowledge management tools and by providing training and open access to its own laboratories and research facilities for external researchers.

**Relevant Commission policy objectives:**

- safe operation of EU nuclear facilities through improved reactor and fuel cycle safety, waste management, decommissioning and emergency preparedness;
- sustain safety developments and assessments for innovative reactor systems and related fuel cycles;


\textsuperscript{42} Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Energy Technologies and Innovation (COM(2013)253).

\textsuperscript{43} OJ L 316, 14.11.2012

\textsuperscript{44} COM(2014) 500 final.

- ensure that the EU has efficient and effective systems for safeguarding completely the nuclear fuel cycle;
- promote faster and more efficient harmonisation and standardisation processes by raising excellence in the nuclear science base;
- ensure highest competence and expertise for nuclear safety assessment in the EU by fostering knowledge management, education and training;
- support the efficient use of research infrastructures by involving the JRC facilities in EU and Member State research programmes;
- provide technical and scientific support for the implementation of EU internal policy, in particular with regard to:
  o Euratom Treaty Articles 36, 39, 41 and 43;
  o Nuclear safeguards (Euratom Treaty Chapter 7)
  o Nuclear safety directive\textsuperscript{46}
  o Spent fuel and radioactive waste management directive\textsuperscript{47}
  o Basic safety standards\textsuperscript{48}

Key orientations for the JRC:

3.3.1 Safety of nuclear reactors and nuclear fuels

a) Collection, analysis, and assessment of nuclear power plants’ operational experience worldwide, and dissemination of information to the Member States’ regulatory authorities.
b) Research on structural materials for analysis and modelling of ageing of components and structures with a view to improving residual lifetime assessment techniques.
c) Improvement of the safety assessments of innovative reactor designs in synergy with the Generation IV International Forum (GIF).
d) Generation of reference samples and scientific data on the safety performance and development of codes and modelling for safety assessment of both conventional and innovative nuclear fuels in operational, transient and accident conditions.
e) Support the EU’s internal policy on nuclear safety by providing technical and scientific assistance to the implementation of the EU Nuclear Safety, Nuclear Waste and Spent Fuel and Basic Safety Standards directives and related EU policy.

**Horizon 2020 indirect research**

The key orientations in section 3.3.1 contribute to the specific objective ‘Support safe operation of nuclear systems’.

3.3.2 Safety of spent fuel, radioactive waste management and nuclear decommissioning

a) Development of techniques for spent fuel and nuclear waste characterisation and study of the physico-chemical mechanisms relating to the long-term storage of spent fuel and disposal of nuclear waste.

b) Obtention of scientific data and preparation of reference samples of spent fuel to reduce the radiological toxicity of wastes, and for the safety assessment of recycling technologies.

c) Development and assessment of innovative technologies and techniques applied to nuclear decommissioning. Exchange and dissemination of knowledge developed, findings and information.

**Horizon 2020 indirect research**
The key orientations in section 3.3.2 contribute to the specific objectives ‘Development of solutions for the management of radioactive waste’.

### 3.3.3 Nuclear emergency preparedness and response (EP&R), environmental monitoring and radiation protection

a) support for the Member States on the exchange of information in case of emergency and on radiological monitoring and measurements relating to radioactivity in the environment, including maintaining the related database and reporting system;

b) Enhancement of preparedness for nuclear or radiological incidents through benchmarking of environmental dispersion models and development of severe accident modelling, radiological source term evaluation and accident management of nuclear power plants.

### 3.3.4 Nuclear safeguards

a) Development of destructive and non-destructive methods and techniques and development of standards to support the Euratom safeguards system. Operation of the Safeguards on-site laboratories and in-field support for Euratom inspections.

b) Development of containment and surveillance techniques in the nuclear fuel cycle process, from enrichment facilities to geological final disposal.

### 3.3.5 Promote excellence in the nuclear science base for standardisation

a) Understanding the fundamental properties and behaviour of innovative nuclear and structural materials for safety assessment and model validation.

b) Support to standardisation and harmonisation of radiological measurement methods in the EU and collaboration with key partner countries and international organisations (IAEA, OECD-NEA) in the field, by providing state-of-the-art nuclear reference materials, measurements and data and by developing and implementing relevant test standards, databases and assessment tools.

c) Set up and operation of a reference centre for radioactivity measurements in food air, water and soil.
3.3.6 Knowledge management, training and education

a) Monitoring EU trends in human resources in the nuclear energy field and facilitating the mobility of human resources in the sector throughout the EU. Developing tools for knowledge management and preserving the EU’s expertise.

a) Preserving, aggregating and disseminating specific scientific and technical knowledge related to nuclear safety, safeguards and security by providing operational support and training and by increasing access to the JRC nuclear laboratories for researchers from EU Member States and international organisations.

b) Reviewing the tools used for public participation in the nuclear energy field, and developing a knowledge centre for transparency governance.

**Horizon 2020 indirect research**

The key orientations in section 3.3.7 contribute to the specific objective ‘Development of nuclear competences at EU level’.

4 A deeper and fairer internal market with a strengthened industrial base

4.1 Internal market, industry, entrepreneurship and SMEs

The internal market is a key to boosting growth and jobs. The areas with the highest growth potential are services, networks and the digital economy. Trade integration in the internal market for goods currently stands at around 22% and at around 5% for services. E-communications, energy and transport activities together account for 8.9% of value-added and 6.1% of employment in the EU-27 and are still growing. However, cross-border e-commerce is still limited.\(^{49}\)

The importance of a strong industrial sector for economic resilience has been underlined by the recent economic crisis. Industry accounts for over 80% of Europe’s exports and private research and innovation. Almost one in four private sector jobs is in industry, and every additional job in manufacturing creates 0.5-2 jobs in other sectors.\(^{50}\)

Policies aim to help turn the EU into a smart, sustainable, and inclusive economy by implementing the industrial and sectoral policies of the flagship Europe 2020 initiative. Support to the 23 million SMEs in the EU is crucial, since they represent some 99% of businesses,\(^{51}\) notably by reducing administrative burdens; facilitating access to funding and supporting access to global markets.

**Relevant Commission policy objectives:**

- implement new Internal Market Strategy;
- implement an integrated industrial policy, in particular to encourage the creation and growth of SMEs;
- implement EU space policy, in particular the Galileo and Copernicus, protection of space infrastructures, space exploration and space industry


\(^{50}\) Press Release IP/14/42 of 22 January 2014. Statistics are for 2013.

monitor and support the development of the regulatory framework for market access, international trade relations and regulatory convergence for both cosmetics and medical devices.

**Key orientations for the JRC:**

a) Industrial policy development, notably to support standardisation via pre-, co- and peri-normative research, reference measurements and (nano-)materials; Eurocodes; vehicle emission test procedures and assessment of innovative technologies, including via international cooperation; sustainability and criticality of raw materials; advanced manufacturing and Key Enabling Technologies; collaborative economy, analysis for R&D Scoreboard, SMEs, Small Business Act, European Competitiveness Report and Fitness Checks; and structured public-private stakeholder dialogues.

b) EU space policy, notably for Galileo and the European Geostationary Navigation Overlay Service (EGNOS), including signal, receivers and technical support to the oversight of Horizon 2020 Infrastructure related R&D actions, notably management of R&D assets and any resulting IPR; plus Copernicus, including applications and spatial information analysis tools, private sector innovation, civil and international space dialogues and implementation of services.

c) Support to the regulatory framework on medical devices, including in vitro diagnostics, and for cosmetics, including promotion of alternative methodologies to animal testing.

d) Support to the development of nuclear techniques for medical therapy and diagnosis and to the quantitative standardisation of nuclear medicine.

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### 4.2 Intellectual property rights

**Relevant Commission policy objective:**

- Protect and enforce the EU’s intellectual property rights.

**Key orientations for the JRC:**

a) Manage the JRC’s and the Commission’s portfolio of intellectual property rights. Advise and assist the Commission on intellectual property matters. Increase awareness of intellectual property rights within the Commission and in the European Parliament.

### 4.3 Customs policy and the fight against fraud

EU customs authorities make a substantial contribution to helping raise revenue for the EU and Member States’ budgets. They also play an important role in protecting the security and integrity of the supply chain for international goods, protecting the security and safety of the EU and its citizens, facilitating and accelerating legitimate trade movements and promoting EU competitiveness. In 2013, EU customs authorities processed a total of 271 million customs declarations. This equates to over eight declarations per second on average.

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52 SEC(2012) 103 Communication to the Commission: Towards a more effective management of intellectual property rights at the European Commission.
53 EU Customs Strategy: DG TAXUD.
Relevant Commission policy objectives:

- protect the financial interests of the EU by combating fraud, corruption, illicit trade and any other unlawful activities;
- strengthen security and protection of citizens and supply chain security while facilitating legitimate international trade;54
- develop and enhance cooperation between customs authorities and with other tax administrations, governmental agencies and the business community;
- pursue customs modernisation by progressing towards a modern and paperless environment for customs and trade;55
- effective management of the Customs Union.56

Key Orientations for the JRC:

a) Carry out research and analysis, and develop new technologies, material, applications and systems to contribute to combating fraud and other types of criminal activity which threatens the supply chain. For example, by enhancing customs risk analysis by using trade data on the status and movement of cargo containers, supporting the fight against evasion of customs duties and quotas, as well as that against trafficked, smuggled or counterfeited goods; and analysing unknown substances.

b) Establish pilot programmes to build capacity among and educate custom authorities on how to use such applications or technologies and share information and best practice.

5 A deeper and fairer Economic and Monetary Union

5.1 Economic and Monetary Union

Having come through the worst financial and economic crisis in generations, the EU has achieved much towards creating the foundations for sound and sustainable growth.57 Real GDP is expected to rise by 1.8 % in 2015 in the EU and by 1.5 % in the euro area, 0.1 and 0.2 percentage points higher, respectively than projected in winter 2015. For 2016, the Commission has forecast growth of 2.1 % in the EU and of 1.9 % in the euro area.58 However, despite these efforts, the economic recovery remains weak and this in turn is hampering efforts to reduce the high levels of unemployment. The Five Presidents’ Report sets out a roadmap of future initiatives to deepen Economic and Monetary Union by 2025.

Relevant Commission policy objectives:

- ensure the smooth functioning of the EU’s Economic and Monetary Union through a strong economic governance framework;
- promote sound macroeconomic policies in the Member States to ensure balanced and sustainable growth and job creation, and to improve sustainability and quality of public finances;

54 DG Taxud Management Plan 2015, as aligned with the Juncker Priorities.
55 Ibid.
56 Ibid.
57 DG ECFIN’s Management Plan 2015.
- support economic prosperity, growth and stability not only within the EU but also at international level by shaping global economic governance and EU international economic relations.

**Key orientations for the JRC:**

a) Model and carry out socioeconomic analysis of improved macroeconomic, budgetary, structural, and financial developments and policies in the EU. Develop analytical tools to enhance the quality and efficiency of the public sector by optimising public expenditure and designing regulation in a smarter way.

b) Social dimension of Economic and Monetary Union.

### 5.2 Financial stability, financial services and Capital Markets Union

After the onset of the financial crisis, the EU put forward an ambitious and unprecedented series of reforms to secure financial stability and improve the supervision of financial markets. The creation of a robust financial framework for all 28 Member States was supported by the development of a single rulebook for all 8,300 European banks. The completion of the Banking Union has become an important step towards strengthened financial stability. The Capital Markets Union encompassing all 28 Member States has been launched by the Commission in order to diversify the financing of the real economy.\(^{59}\)

**Relevant Commission policy objectives:**

- make the EU’s financial system less crisis-prone and better focused on delivering the services required by end-users, including citizens and businesses;
- make a significant contribution to economic growth and employment, social progress and sustainability;
- ensure the development of an integrated, well-regulated, transparent and liquid Capital Markets Union for all 28 Member States.

**Key orientations for the JRC:**

a) Quantitative analysis for the development of the Capital Markets Union as well as the completion of the Banking Union.

b) Assess initiatives related to the regulation of the financial sector as well as new dynamics and risks. Maintain and further develop a data infrastructure for the EU financial sector analyses.

### 5.3 Taxation

#### 5.3.1 Taxation policy

Fight against tax fraud and aggressive tax planning should ensure more taxation fairness in the internal market and globally.\(^{60}\) The rules that govern corporate taxation in the EU today are out-of-step with the modern economy. Uncoordinated national measures are being exploited by some companies to escape taxation in the EU. This leads to significant revenue losses for Member States, a heavier tax burden for citizens and competitive distortions for

\(^{59}\) COM(2015) 468 final

\(^{60}\) DG TAXUD’s Management Plan 2015.
businesses that pay their share. The action plan adopted by the Commission in June 2015\textsuperscript{61} sets out a new EU approach for fair and efficient corporate taxation. Tax policy strategies should also aim at ensuring sustainable fiscal consolidation strategies.

Relevant Commission policy objectives:\textsuperscript{62}

- combat tax evasion, tax fraud and aggressive tax planning;
- ensure that the EU tax framework is fit for purpose;
- stimulate growth and employment-friendly fiscal consolidation.

Key Orientations for the JRC:

a) Modelling and economic analysis of tax policies using the EUROMOD microsimulation model; measuring, by means of economic experiments, civic norms for cooperation across the EU to better understand the behavioural roots of different levels of tax compliance.

b) Modelling to support the action plan for fair and efficient corporate taxation in the EU. Carry out analysis of the effects of corporate taxes and notably, develop modelling tools for assessing the impact of anti-avoidance rules, harmonisation of specific rules, changes in tax treaties and future policy initiatives taken at EU level.

6 A reasonable and balanced free trade agreement with the United States

6.1 Trade policy

The export activities of EU-based firms has become an increasingly important driver of jobs across Europe. In 2011, one in seven EU jobs was supported either directly or indirectly by exports to the rest of the world. Between 1995 and 2011, EU employment supported by EU exports increased by 12.5 million jobs (+67 %), to reach a total of 31.1 million jobs.\textsuperscript{63} If the current trade policy agenda is completed, it could add around €150 billion to the EU economy. Together, the EU accounts for 19 % of world imports and exports. The EU-28 received €324 billion in foreign direct investment in 2013\textsuperscript{64}

Relevant Commission policy objectives:

- Ensure that EU businesses, workers and consumers have the best possible trade conditions and opportunities;
- Create a global system for fair and open trade, supporting sustainable development.

Key orientations for the JRC:

\textsuperscript{64} Eurostat News release STAT/16/99, 20 June 2014.
a) Provide methodological, modelling and analytical support with regard to the socioeconomic and environmental implications of external trade (e.g. quantification of non-tariff barriers; assessment of standards and regulatory coherence with trading partners; analysis of the impact on the interaction between external trade and the functioning of the single market, notably on promoting employment and value-added; production of multi-country input-output tables for analysing global production, trade and value chains).

7 An area of justice and fundamental rights based on mutual trust

7.1 Justice, consumers and gender equality

7.1.1 Justice and gender equality
EU citizens increasingly travel, study, vote, work, benefit from healthcare, marry, have children, buy property, divorce and die in a Member State other than the one in which they were born. Consumers buy goods and services from other countries, including online. The mission of the Directorate-General for Justice and Consumers is to uphold and strengthen the rights of people living in the EU, whether they are acting as citizens, consumers, entrepreneurs or workers.65

Relevant Commission policy objectives:
- justice for citizens – develop a European area of justice, a Europe of rights, based on the rule of law and the independence of the judiciary;
- ensure that consumers have access to safe products and services across the EU, and that their personal data are protected, no matter where in the world they are stored;66
- create a regulatory framework to improve the business environment for investors, stakeholders and companies, while at the same time preventing money laundering and financial malpractice.

Key orientations for the JRC:
- a) Assist in measures that tackle online ethical and societal concerns: e.g. improving online personal data protection and cooperation between data protection supervisory authorities.

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<th>Horizon 2020 indirect research</th>
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<td>Key orientation (a) contributes to the focus area ‘Digital security’.</td>
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7.1.2 Consumer policy and consumer rights
Consumer expenditure accounts for 56% of EU GDP. Problems reported by consumers in 2011 have an estimated value of around 0.4% of EU GDP, with more than one fifth of EU consumers reporting a problem in the previous 12 months.67

Relevant Commission policy objectives:68
- Ensure that consumers have access to safe products and services across the EU.69

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67 Communication on ‘A European Consumer Agenda’, report on consumer empowerment in the EU.
68 European Consumer Agenda Communication.
Key orientations for the JRC:

a) Analysis of statistical indicators and methodologies to monitor consumer behaviour and market performance; analysis of information and communication technologies, and behavioural determinants, with the view of empowering consumers;

b) Harmonised methods and scientific guidance for the chemical safety of non-food consumer products.

7.2 Home Affairs and Security

Home affairs policies are based on Europeans’ core values and principles – freedom, democracy, rule of law, equality, tolerance, and respect of human rights. Terrorism, organised crime, and cybercrime are complex and evolving security challenges that cross European borders. The dramatic events which have unfolded this year confront Europe with challenges that defy the capacity of individual countries to act alone and require a coordinated and collaborative European approach.

Relevant Commission policy objectives:

- Contribute to ensuring a high level of security in Europe whilst safeguarding freedoms in order to combat terrorism, organised crime and cyber crime across European borders.

Key orientations for the JRC:

a) Strengthening resilience, response to crises and diminishing chemical, biological, radiological and nuclear materials (CBRN) threats: improving the security and resilience of critical infrastructures, as well as identifying infrastructure vulnerabilities and inter-dependencies; developing crisis management technologies to deal effectively with such situations; supporting the implementation of CBRN-explosives (CBRN-E) action plans.

b) Providing technical support, intelligence techniques and research to assist Member State authorities in law enforcement in areas such as cybercrime (including the online sexual abuse of children), open source intelligence and new psychoactive substances.

8 Towards a new policy on migration

8.1 Migration

Migration and refugee movements are one of the biggest challenges the EU faces. The number of asylum applications registered across the EU has increased by 44 % from 435 000 in 2013 to 626 000 in 2014. There has been a major increase in irregular border crossings. In the first 5 months of 2015 over 153 000 migrants were detected at Europe’s external borders. This represents a 149 % increase compared with the same period in 2014.

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71 Progress of the European Commission’s Ten Priorities, 2015.
72 Progress of the European Commission’s Ten Priorities, 2015.
In 2012, EU Member States issued 2,106,144 residence permits to non-EU nationals,\textsuperscript{73} including 489,354 permits to third-country nationals for remunerated activities. In 2012, there were 20.7 million third-country nationals living in the EU, amounting to around 4.1% of the total EU population.\textsuperscript{74}

**Relevant Commission policy objectives:**\textsuperscript{75}

- Contribute to ensuring a high level of security in the European Union while facilitating legitimate travel, through a uniform and high level of control at the external borders and the effective processing of Schengen visas, in compliance with the EU’s commitment to fundamental freedoms and human rights;

- Contribute to the effective management of migration flows and to the implementation, strengthening and development of the common policy on asylum, relocation, subsidiary and temporary protection, and the common immigration policy, while fully respecting the rights and principles enshrined in the Charter of Fundamental Rights of the European Union.

**Key orientations for the JRC:**

a) Developing tools, methodologies and analysis aimed at enhancing the effectiveness of border security and control with also the view of understanding migratory flows, such as: technical systems concerning illegal border crossings; the possession of illegal travel documents; migratory push and pull factors; knowledge and tools for early warning, situational prediction and risk analysis in the maritime domain; the detection of substances and objects; the use of the *Laissez-Passer* travel document;\textsuperscript{76} A JRC Knowledge Centre for Migration and Demography will provide policy-oriented research and evidence-based analysis, observatories and partnerships, as well as capacity building.

\section*{9 Europe as a stronger global actor}

\subsection*{9.1 Global safety and security}

\subsubsection*{9.1.1 Fight against trans regional and global threats including disaster resilience and crisis management}

**Relevant Commission policy objectives:**

- Establish a coherent cross-sectoral EU risk management policy, which promotes a holistic approach for all natural and man-made risks. This work is based on risk assessments and planning, development of an EU-wide overview of risks; improving data and the knowledge base, sharing of good practices, and the application of minimum standards for disaster loss data.

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\textsuperscript{73}Immigration in the EU, Facts and Figures, 2014: http://ec.europa.eu/dgs/home-affairs/e-library/multimedia/infographics/index_en.htm#0801262489e0e61e/c.


\textsuperscript{75}Commission President Juncker’s ten priorities, ‘Towards a New Policy on Migration’.

- Improve effectiveness of policy measures and practices for prevention, preparedness and response against all types of disasters at EU and Member States level while taking climate change into consideration.

- Improve the evidence base for humanitarian aid programmes and other supporting activities;

- Support with scientific and analytical capacities/systems the Emergency Response Coordination Centre (ERCC) as the EU’s response platform for both humanitarian aid and for cooperation and coordination between the countries participating in the EU Civil Protection Mechanism.

- Increase the EU’s and third countries’ resilience to crises and disasters and strengthen their preparedness to respond to crises and global and trans-regional threats.

- Address global security challenges with international partners, including CBRN risk mitigation as well as the security and development nexus, in particular in support of the Instrument contributing to Stability and Peace.

**Key orientations for the JRC:**

**a) Disaster resilience and crisis management** – provide scientific and analytical services, develop tools and build capacity to support the entire disaster risk management cycle (disaster prevention, preparedness and response), including via a dedicated Knowledge Centre for Disaster Risk Management, and provide assistance for risk vulnerability and crisis assessment to improve the evidence base for humanitarian emergencies and disasters.

**b) Fight against global, trans-regional and emerging threats** – support activities contributing to Stability and Peace, including analysis, provision of methods and tools, capacity building and collaboration with international partners for monitoring of raw materials, ensuring maritime security and countering global and trans-regional threats; develop early warning systems and capacity-building activities.

### 9.1.2 Global nuclear safety and security

The EU Common Foreign Security Policy, the European Security Strategy (2003), the EU Strategy Against Proliferation of Weapons of Mass Destruction (WMD), the EU Counter Terrorism Strategy (2005) and the New Lines for Action in Combating the Proliferation of WMD and their Delivery Systems endorsed in 2008, all together reinforce the EU’s commitment to nuclear security.

Export controls, as a security-related trade instrument, remain, more than ever, at the forefront of international non-proliferation efforts. The EU export control regime is governed by Council Regulation (EC) No 428/2009, which provides for common EU control rules, a common EU control list and harmonised policies for implementation.

Following a the CBRN Task Force's report, the Commission presented a Communication on strengthening CBRN security in the EU, including an EU CBRN Action Plan. The JRC support is based on its extensive experience.

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The JRC provides independent, customer-driven scientific and technological support for formulating, developing, implementing and monitoring EU global policies in nuclear safety and radiation protection.


The cooperation with IAEA on nuclear safeguards is managed under the Commission Cooperative Support Programme, set up in close cooperation with DG ENER in 1981.

Nuclear security cooperation with IAEA is implemented under the Practical Arrangement signed in 2013 between the European Commission and IAEA and where the JRC is the Commission implementing body. The ongoing occurrence of the smuggling of nuclear and radioactive materials, as reported to the IAEA Incident and Trafficking Database, indicates that materials continue to be encountered out of regulatory control. The IAEA nuclear security Conference of July 2013 as well as the Nuclear Security Summits of 2010, 2012 and 2014 have been addressing the global challenge of nuclear security and countering nuclear terrorism. The EU is a key player in contributing to the development of a global nuclear security architecture.

As the Euratom Implementing Agent for the Generation IV International Forum (GIF), the JRC will continue to coordinate the EU’s contribution to the GIF, ensuring the proper science and technology feedback for the JRC and DG RTD programmes.

The JRC will pursue and further develop international research cooperation with key partner countries (e.g. USA, Japan, China) and international organisations (e.g. IAEA and OECD/NEA) in order to promote the EU’s nuclear safety and security policies.

Commission policy objectives:

- provide technical and scientific support in the implementation of EU policies in nuclear safety, security and radiation protection in non-EU countries.
- develop international safety research cooperation with key partner countries and relevant international organisations contributing to the development of international standards, (including IAEA safety standards and guidance documents);
- Ensure the EU with an efficient and effective system for combating illicit trafficking and nuclear forensics; including technical training on nuclear security;
- support the implementation of EU policies on home affairs, energy, trade, customs, industry and global security including the implementation of the CBRN-E related policies;
- support the implementation of the Euratom and IAEA nuclear safeguards regime and provide assistance to EU Member States’ safeguards authorities;
- fulfil the Euratom Implementing Agent function for the Generation IV International Forum (GIF) and coordination of the EU contribution to GIF, as requested by Council Decision 05/14929.

Key orientations for the JRC:
a) Technical assistance and scientific support for the implementation of the EU policies in the fields of nuclear safety (Instrument for Nuclear Safety Cooperation), nuclear safeguards (European Commission Cooperative Support Programme to the IAEA) and nuclear security (Instrument contributing to Stability and Peace and International Working Groups membership).

b) Development of methods, technologies and standards for the detection of nuclear and radioactive materials outside regulatory control and fighting its illicit trafficking; supporting the EU policy on nuclear non-proliferation through the implementation of the EU export control regime and the analysis of open source information. Operational support to Member States and international organisations.

c) Support for Member States, partner countries and international institutions (IAEA, and others) to enhance the technical knowledge on nuclear security using the European Nuclear Security Training Centre (EUSECTRA). Training to support the implementation of the EU non-proliferation policy.

d) Contributing to safeguards, proliferation resistance and physical protection of innovative designs of nuclear reactors in synergy with the Generation IV International Forum (GIF).

9.2 International cooperation and development

Collectively, the EU and its Member States are the world’s biggest aid donor, providing over 50% of global official development assistance, and the largest source of humanitarian aid. In 2014, the EU and its Member States provided EUR 58.2 billion of official development assistance. As for humanitarian aid, the Commission alone provided relief assistance to more than 122 million people in 80 countries outside the EU, totalling €1.27 billion.

Relevant Commission policy objectives:
- eradicate world poverty;
- foster inclusive and sustainable development for current and future generations;
- improve aid effectiveness, harmonisation and ownership by partner countries;
- enhance a global partnership for sustainable development, the EU’s contribution, and coherence among EU’s policies and instruments;
- provide rapid help and relief to preserve life and alleviate the suffering of victims of natural disasters and man-made crises;
- support conflict prevention and peace building

Key orientations for the JRC:

9.2.1 2030 Agenda on Sustainable Development

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79 Agenda for change, Policy coherence for development; European consensus on humanitarian aid and EU commitments on financing for development; achievements and aid effectiveness related to the Millennium Development Goals.
a) Support the monitoring and implementation of Sustainable Development Goals (SDGs) by developing and integrating knowledge management tools and organising information on related policies, indicators, methods and data, facilitating the integration of social, economic and environmental information necessary to reach the SDG targets.

9.2.2 **Food and nutrition security, rural development and sustainable agriculture**

a) Monitor food and nutrition security, agricultural and natural resources, support information systems, and carry out research activities while contributing to sustainable agriculture, nutrition and resilience in developing countries.

**Horizon 2020 indirect research**

Key orientation a) contributes to the focus area ‘Sustainable food security’.and the Food Research Area for Food and Nutrition Security Research and Innovation in Europe and in a Global context.

9.2.3 **Climate change, environment, natural resources, and water**

a) analysis, capacity building, provision of data, maps and methodologies on the extent, vulnerability to, and risk of current and future weather-driven disasters in developing countries, including guidance towards a more targeted allocation of climate finance, in particular in support of the Global Climate Change Alliance;

b) monitoring, scientific advice, development of ICT tools, dissemination of information, and capacity building for partners in developing countries, to support related multilateral or bilateral agreements and cooperation initiatives, in particular in natural resource management through applied space technologies, and with a focus on forestry, biodiversity, ecosystem services, agriculture, climate change and water.

9.2.4 **Energy**

a) Map out and monitor activities, develop GIS (geographic information systems) tools, provide technical assistance, share best practice and build capacity in support of international, bilateral and regional energy cooperation initiatives, including on renewable energy.

9.2.5 **Humanitarian-, development- and cooperation horizontal policies**

a) Develop methodologies, indicators and ICT tools, and carry out macroeconomic analyses of development issues in support of the Agenda for Change, policy coherence for development, and aid effectiveness and transparency, with a focus on measuring the impact of EU aid and cooperation on eradicating poverty.

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80 This key orientation focuses specifically on JRC projects contributing to development policies in the field of ‘food and nutrition security, rural development, and sustainable agriculture’. It is intrinsically linked to the ‘Agriculture and Rural Development’ policy area.
9.3 Associated and neighbourhood countries

Commission policy objectives:

- Consolidate European integration, unity and solidarity bringing peace and stability to the European Neighbourhood by continuing ongoing enlargement negotiations, notably with the Western Balkans that will need to keep European perspective, and by increasing close cooperation, association and partnership with Neighbourhood countries to further strengthen economic and political ties.

Key orientations for the JRC:

a) Provide support to the Enlargement and H2020 Associated Countries to address, through scientific evidence, key national priorities, and promote their participation in Smart Specialisation exercises.

b) Provide support for regional development policies through networking activities, capacity building and enhancing complementarity and integration with the macro-regional strategies.

10 A Union of democratic change

The JRC will contribute to build a European Union based on transparency and dialogue among the Commission and its major stakeholders. Enhancing open science and open innovation will also support democratic change and broader participation.

Strategic partnerships are crucial for the JRC to maintain its scientific excellence but also to enhance the transparency of policy development within the Commission and to help build consensus on policy issues. The JRC works closely with these strategic partners to ensure high quality input to the development of EU policies.

The JRC will reinforce an effective and continuous interface and report mechanism with other EU institutions and bodies, notably with the European Parliament, the Council, other EU bodies and consultative committees.

Partnerships and cooperation with Member States and the JRC will be further strengthened in areas where the JRC has developed specific skills – at both national and regional level – with national parliaments, the bodies drawing up national policies, Permanent Representations of the Member States to the EU, and also multilaterally, through the JRC’s support for macro-regional strategies. An active two-way dialogue will be encouraged with key stakeholders and umbrella organisations representing the interests of research, innovation, industry and civil society in Europe, enabling the JRC to exchange knowledge and experience with its stakeholders and to provide better scientific support to the European policymaking process. In addition, it will explore participation in public-public partnerships.

The JRC will also continue to support the functioning of the European Research Area, not least through providing opportunities for doctoral students, post-doctoral research fellows and seconded national experts to work on its premises. Additionally, the Knowledge and Innovation Communities (KICs) of the European Institute of Innovation and Technology are an interesting proving ground for Europe’s capacity to work along the entire research and innovation cycle. By collaborating with the KICs, the JRC would have access to world-class, wide-ranging and interdisciplinary research, a large pool of bright young minds, leading technology transfer offices, and networks of private and societal partners.
Partnerships with key industry associations and employers’ organisations as well as with non-governmental and civil society organisations will continue to be an important part of the JRC’s networking activities, providing opportunities for exchange on research and technological developments, alignment on societal challenges and helping to prevent the duplication of work. The JRC’s involvement in public-private partnerships will continue to help leverage public investment in the development of key technologies and areas.

In line with Horizon 2020, the JRC will pursue a strategic approach to international cooperation to make it possible to access the best researchers and sources of expertise around the world. The JRC’s international relations will focus on the countries in view of their economic, political and scientific position, such as USA, Brazil, China, Japan, South Africa, India, Mexico. Additionally, the JRC will proactively engage with innovation-driving organisations. Scientific cooperation will also be strengthened with international organisations, in particular the UN system, to channel solid scientific evidence into global decision-making, as well as with OECD, WHO, World Bank, CERN and regional bodies. In view of a rapidly evolving and increasingly competitive global R&I landscape, the JRC will regularly review, align and adapt the parameters of its international work.

The JRC will actively support the Commission’s Better Regulation Agenda, under which the Commission has committed itself to ensuring that policy is prepared, implemented and reviewed in an open, transparent manner, informed by the best available evidence and backed up by the comprehensive involvement of stakeholders. The JRC, through the evidence it provides to support policy development, implementation and evaluation, can enrich these processes. In the same way that the JRC has supported the Impact Assessment Board, it should continue to support the Regulatory Scrutiny Board and could usefully also present the evidence it gathers to the REFIT Platform.81

Since 2014, the JRC has been implementing an open access policy which covers its direct research findings and is consistent with the Horizon 2020 open access principles. Appropriate performance and impact indicators related to the open access strategy will be phased in after a testing period.

Competitive and open access to high quality research infrastructures underpins European research and attracts the best scientists from around the world. The JRC has recognised the importance to safeguard its scientific excellence and provide capacity-building opportunities by opening access to a number of its own world-class research infrastructures, including e-infrastructures – a total of 45 specialised large-scale research facilities and over 100 scientific databases. An initiative to open up the JRC infrastructures and associate them to the European Strategy Forum on Research Infrastructures and to the research infrastructures of global interest managed by the Group of Senior Officials is ongoing.

11 Cross-cutting activities

The JRC carries out high quality exploratory research to develop in-house the skills and knowledge necessary to better anticipate the science needed for EU policymaking. Exploratory research accounts for approximately 5% of the JRC’s scientific activities and is integrated throughout the work programme.

81 C(2015) 3261 final
The JRC continues to develop its capacity to monitor significant upcoming trends through horizon scanning, anticipate societal challenges and their impacts on policy, analyse complex problems with a system thinking approach and identify forward-looking solutions through foresight processes. The JRC’s competences in relation to socioeconomic research and behavioural sciences will be further developed. In order to support innovation in policymaking, an EU Policy Lab is developing, working to combine foresight, behavioural insights and design for policy. The EU Policy Lab offers a safe space to co-design projects and policy initiatives with the engagement of stakeholders and policymakers.

The JRC will enhance the development of ‘better regulation’ tools, in particular to contribute to high quality impact assessments of policy proposals and policy options, and promote their application at EU and Member State level. It will provide scientific and methodological support to the impact assessment process.

The JRC will strengthen its modelling capacity. This will include further development of sectoral models and their links to or integration with cross-sectoral analysis and sensitivity analysis. The JRC will continue its work on ensuring the consistent use of data and assumptions in its modelling across different policies, and the use of shared baseline scenarios.

The JRC will launch three pilot Competence Centres: a Competence Centre on Composite Indicators, a Competence Centre on Microeconomic Evaluation and a Competence Centre on Modelling. Competence centres will provide access to scientific and technical skills to EU policymakers, and more particularly to Commission services, by identifying and building capacities in the use of specific competences, tools and methods for the design, implementation and evaluation of EU policies. The competence centres will support the Better Regulation Agenda.

The JRC will continue to support to the European Semester process, and will look at ways of better using its detailed knowledge of particular sectors (e.g. energy and taxation) to support the work of policy DGs on developing country-specific recommendations.

Standardisation is at the core of the JRC’s work and includes the development of European and international standards, pre-, co- and peri-normative research, harmonised methodologies, certification, the preparation of standards, reference measurements and materials, and a standardisation helpdesk available to Commission services. The JRC will actively support the development and implementation of the EU strategy for standards and the standardisation system. This work will be consistent with the annual work programme for European standardisation.

The JRC support for the Copernicus earth observation system and to the Global Earth Observation System of Systems (GEOSS) crosses many policy fields (e.g. agriculture industry, maritime, transport, external action, civil protection, humanitarian aid). Activities will aim to facilitate the increased exploitation of data from European satellites, as well as in situ monitoring, via the processing, distribution, quality control and standardisation of space data, and support the development of new information products and services resulting from those data.

The JRC’s media monitoring and analysis tools (such as multilingual information text-mining and tools to analyse online information sources) are providing support for informed decision-making across all policy areas in the Commission and in other European institutions (the European Parliament, the Council and the European External Action Service).

Key orientations for the JRC:
a) Support innovation in EU policymaking through the development of generic tools and processes (i.e. anticipation, behavioural insights, design for policy, citizens’ engagement, media monitoring, counterfactual evaluation, composite indicators and scoreboards).

**Evaluation of the impact of the JRC’s work programme**

In line with the Regulation establishing the Horizon 2020 framework programme, the Commission will monitor annually the implementation of Horizon 2020 and the Horizon 2020 Specific Programme. This monitoring will be based on quantitative and, where appropriate, qualitative evidence, and will include information on cross-cutting topics (such as the social and economic sciences and humanities, sustainability and climate change). The areas covered will include climate-related expenditure, SME participation, private sector participation, gender equality, including the gender dimension in research content, widening participation and progress on performance indicators. This monitoring process will also be applied to the JRC’s direct actions.

Furthermore, under the decision establishing the Horizon 2020 Specific Programme and the Regulation on the Research and Training Programme of the European Atomic Energy Community (Euratom) complementing the Horizon 2020 framework programme, two key indicators were established to assess the results and impacts of the JRC’s direct actions. These key indicators may be refined while Horizon 2020 is being implemented. They refer to the number of occurrences of tangible specific impacts on European policies resulting from technical and scientific support provided by the JRC, and the number of peer-reviewed publications in high-impact journals.

Furthermore, in line with the Regulation establishing the Horizon 2020 framework programme and the Regulation on the Research and Training Programme of the European Atomic Energy Community (Euratom) complementing the Horizon 2020 framework programme, the Commission will carry out interim and ex-post evaluations of the JRC’s direct actions under both Horizon 2020 programmes.

In line with the Regulation, the JRC’s work programme will be subject to an annual internal evaluation. This will provide coherent information on the two official indicators and will be used for (a) the mid-term and ex-post evaluations of both Horizon 2020 programmes, and (b) reporting as part of the Commission’s strategic planning and programming cycle. Moreover, these indicators will form part of JRC’s the wider set of indicators under the Commission’s performance framework for spending and non-spending programmes.