

Horizon 2020 Strategic Programming Document

Guidance for the development of the Work Programme 2016-2017

Important Notice: Working Document

This paper is a working document. It is sent to the Programme Committee for the Horizon 2020 Specific Programme for discussion in the context of the preparation of the Horizon 2020 Work Programme 2016-2017. As such, information and descriptions of activities indicated in this document may not appear in the adopted Work Programme 2016-2017, and likewise, new elements may be introduced.

1. Introduction

Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly EUR 80 billion of funding available over seven years (2014 to 2020). The Horizon 2020 *Specific Programme* is implemented through two-year work programmes setting out funding opportunities under the different parts through calls for proposals. As with the Work Programme 2014-2015 which was adopted at the end of December 2013 with a budget of EUR 15 billion, the Work Programme for 2016-2017 covering investments worth EUR 17 billion will also be developed on the basis of a strategic programming process.

This process provides a coherent and integrated approach for the preparation of the Work Programme for 2016-2017. Strategic programming is not about creating new priorities. It is about maximising the impact of the available EU funding through the way the objectives set out in the Horizon 2020 *Specific Programme* are implemented over the life of the programme.

With the Horizon 2020 *Specific Programme* as the basis, **this document will provide guidance for the development of the content of the next work programme.** It describes the political context and highlights, while not intending to be exhaustive, key priorities for the Work Programme for 2016-2017, some of the key features and novelties, as well as next steps. It also includes in annex information on the strategic programming process, and scoping papers which set out in more detail the main priorities for each part of the Horizon 2020 work programme, their expected impacts and the justification for their selection based on evidence gathered through a broad consultation of external stakeholders.

2. Political context

Although there are positive signs, the EU still has a long way to go before it overcomes the effects of the economic crisis and the high unemployment rate, especially amongst young people, remains the biggest concern and challenge in many Member States. The five point strategic agenda for the Union in times of change set by the European Council and followed up by the new Commission's agenda for jobs, growth, fairness and democratic change is a strong response to the challenges we face, namely by strengthening our global competitiveness, stimulating investments from both public and private sources, promoting growth and creating new and sustainable jobs for the benefit of the economy and citizens.

The agenda of the new Commission sets out ten policy areas on which the EU needs to focus its efforts over the next five years. This includes maximising the opportunities and assets of the EU by fully exploiting the potential of the single market as well as of international markets and reinforcing its global attractiveness as a place of production, investment, education and living, thus delivering benefits for all by promoting a climate of entrepreneurship, job creation and social fairness.

Research and innovation represent major drivers to both stimulate and leverage investment, providing new solutions and the knowledge which will help to deliver the new Commission's agenda. By coupling research and innovation, and its emphasis on excellent science, industrial

leadership and tackling societal challenges, Horizon 2020 will: mobilise innovative financial instruments; facilitate investment in research infrastructures and skills; maintain and reinforce a high-performing primary sector and industrial base; enhance the use of digital technologies and ICT solutions; capitalise on and promote further our existing strengths in renewables and energy efficiency; contribute to combatting cross-border crime and terrorism while also guaranteeing fundamental rights and values and protecting Europeans' personal data; provide new insights for policy-making towards reversing inequalities and promoting fairness; enhance collaborations between the public and private sectors in delivering innovation; and maximise potential synergies with the European Structural and Investment Funds (ESIF) at national and regional level.

3. Key priorities for 2016-2017

On the basis of the strategic programming process, including a broad consultation of stakeholders, and the Horizon 2020 *Specific Programme*, key priorities for 2016-2017 have been identified for the development of the next work programme. In alignment with the new Commission's agenda, the Work Programme for 2016-2017 will contribute to the Jobs, Growth and Investment Package helping to strengthen Europe's global competitiveness, create new and sustainable jobs and promote growth. All the calls for proposals and activities will contribute substantially to this policy area as well as contributing in broader terms to one or more of the other policy areas.

A new Boost for Jobs, Growth and Investment

Investments will cover both the immediate need to engage the re-industrialisation of Europe as well as the longer-term objective of building solid knowledge needed for the next wave of innovative breakthroughs. A substantial number of Horizon 2020 activities, including innovative forms of financing, are in particular targeted at mobilising additional public and private investment in the European economy and thereby help promote a climate of entrepreneurship and job creation. Investment in researcher skills and competences relevant for the evolving needs of both public and private employers will at the same time respond to the increasing demand for the best talent and will also contribute to strengthening Europe's competitiveness. In particular the following activities are prominent elements contributing to the Jobs, Growth and Investment Package in both the short and longer term:

- As part of the **Innovation Investment Package** representing an investment worth over EUR 22 billion, seven **Public-Private Partnerships** (PPPs) relevant to industry in the fields of innovative medicine, fuel cells and hydrogen, aeronautics, bio-based industries, electronic components and systems, railways, and EU air traffic management system, address strategic technologies that underpin growth and jobs in key European sectors and can help make the EU a more attractive location for international companies to invest and innovate. Complementarity of the work programme with all these activities will be sought to ensure synergies, while avoiding overlaps. These PPPs are complemented by a similar level of investment in eight

contractual Public Private Partnerships (cPPPs) implemented through the work programme on sustainable production processes, energy efficient buildings, green vehicles, cleaner manufacturing processes, telecommunications network infrastructure, high performance computing, robotics, and photonics, as well as a new cPPP related to big data¹, to develop new technologies, products and services which will have a substantial impact on the competitiveness of the EU industry, and the creation of new high-skilled jobs in Europe. More cPPPs are currently under discussion, which may become a reality in 2016-2017.

- Further investments through **financial instruments**, targeted in particular to SMEs, will contribute to the availability of a wider range of debt and equity financing products and facilities to support research and innovation; a stronger venture capital and wider equity industry; the increased involvement of business angels, crowd-funding platforms and philanthropic foundations in funding research and innovation; and more investment in technology transfer.
- Through the European Research Council (ERC), the most talented and creative individual researchers and their teams will be able to investigate the best ideas, based on **excellence**, and carry out frontier research of the highest quality which could lead to new innovative breakthroughs.
- Investing in the skills and competences of the **next generation of excellent researchers** will remain the main focus of the Marie Skłodowska-Curie Actions. Promoting innovative approaches to research training with exposure to the non-academic sector and the stimulation of interdisciplinary, international and inter-sector aspects will also be promoted.
- **Future and emerging technologies** activities help to create in Europe a fertile ground for responsible and dynamic multi-disciplinary collaborations on future and emerging technologies and for kick-starting new European research and innovation eco-systems around them. These will be the seeds for future industrial leadership and for tackling societal challenges in new ways.
- The development, implementation and sustainable operation of pan-European **research infrastructures** help Europe to respond to grand challenges in science and society and boost the productivity and competitiveness of our economy. In this context, e-infrastructures become crucial as a cross-cutting support layer in the storage, transmission and processing of the surging volumes of data. Access to modern and world-class research infrastructures is important for Europe's ability to create cutting-edge research, educate, retain and attract the best research talent and connect researchers globally. Furthermore, partnerships with industry and SMEs on key

¹ This new cPPP on Big Data is expected to be launched during October 2014 taking the total to nine.

technologies need to be exploited to foster innovation and create new market opportunities.

- **Closing the research and innovation divide** to bring innovations to all corners of the EU will remain a key objective, in particular through the new actions on Teaming, Twinning and ERA Chairs.

A substantial number of activities across the work programme will be dedicated to support **EU manufacturing**. The '4th Industrial Revolution' which is underway, will bring dramatic changes in our working and living environments due to the rapid development of IT infrastructure, the evolution of smart devices, and the linking of the physical and the virtual worlds to form cyber-physical systems. This offers huge potential for increasing flexibility, efficiency and productivity, but also resource efficiency and new ways to sustainability in the production and service sector, but also in our everyday life. It is a unique chance for clean, safe and smart "made in Europe". A special emphasis will be on Additive Manufacturing ("3D Printed in Europe"), which promises to transform the manufacturing value chain, allowing a shift from mass production to full customisation and local production.

Other important activities include a call to enhance the innovation capacity of SMEs and the SME Instrument, whose main focus in 2016-2017 will be on facilitating market uptake of innovation, including in international markets and through facilitated access to risk finance and synergies with national or regional support programmes; and the Fast Track to Innovation pilot aimed at reducing the time from idea to market and thus accelerating the development of innovative products, processes and services.

A Connected Digital Single Market

Digital technologies offer huge potential for Europe's economy and society. We need to step up our effort to make much better use of the economic opportunities they provide as well as investigate and influence the changes they bring to the way we work, communicate and live. Promising new developments within the digital domain will be addressed in the next work programme, thereby facilitating the creation of both large-scale pilot lines and new start-ups and successful innovation building on digital research, while at the same time addressing the concerns of citizens in areas such as cyber security and trust. Activities will also help boost digital skills and learning across society. The following activities will in particular contribute to key knowledge and innovative solutions and support the creation of secure digital ecosystems for fast growth and competitive leadership in key industrial sectors:

- The Internet is accelerating innovation, reshaping established industries, facilitating new ways of doing business, and transforming social behaviours. An integrated response to the technology challenges and innovation needs is required to position Europe at the forefront of the Internet developments. The **Internet of Things** call will allow complementing technology developments with large-scale pilots in a number of societal challenges, thus demonstrating actual solutions in real-life settings.

- **Automated Road Transport** drives a paradigm shift in the automotive sector, with decisive implications for the competitiveness of the European industry. It will improve drastically safety and reducing congestion, while contributing to increase energy efficiency and decrease emissions. The call will address component development, human-machine interactions, testing of vehicles and integration with infrastructure, as well as transition scenarios, standards, user behaviour and acceptance.
- ICT-driven transformations bring opportunities across many important sectors but also vulnerabilities to critical infrastructures and services, which can have significant consequences on the functioning of society, economic growth and the technological innovation potential of Europe. The **Digital Security** call will address these issues through innovative approaches.
- Data sets continue to grow larger and more complex. This trend calls for new and better techniques for extracting, managing, analysing and sharing both data and the results of data analyses, while respecting the privacy rights of individuals and the needs for government and corporate confidentiality. Activities on **Big Data** will help accelerate the progress of scientific discovery and innovation, and foster the development of Europe's data-driven economy emphasising a cross-cutting approach, as the research challenges for big data span across many scientific and technical domains, with promising application prospects in numerous areas such as health, energy, transport, climate action, manufacturing and government.

In addition, a call will contribute to maintain and develop the EU position for leading edge technology in key areas such as electronics, photonics, embedded systems, computing, robotics, network technologies and systems or content technologies. Access to research data increases returns from public investment, reinforces open scientific inquiry, and enhances the quality and efficiency of scientific research and innovation, thus providing better business opportunity. The Open Research Data approach will facilitate, through the use of data management plans, access, re-use and preservation of research data resulting from the projects stemming from the work programme.

A Resilient Energy Union with a Forward-Looking Climate Change Policy

There is a strong political will for Europe to become the world number one in renewable energies and climate protection, to significantly enhance energy efficiency beyond the 2020 objective while ensuring affordable energy prices, increasing the security of our energy system at all levels, and reducing environmental impacts. The transition to a climate resilient and low carbon economy is also dependent on a forward-looking multi-disciplinary climate change policy that addresses the challenges and opportunities of limiting the increase in global temperature to below two degrees celsius above pre-industrial levels up to 2050 and beyond. Activities under this work programme will help play a major role in mobilising Europe's research excellence to generate innovative solutions, trigger additional public and private investments, to build European industrial capacities for developing supply chains that

are resilient to global competition, to allow active participation of citizens, and at the same time providing a strong response against global warming and other climatic changes. Some of the main contributing activities concern:

- The **Smart Cities and Communities – with Nature-based Solutions** call aims to bring together cities, industry and citizens to improve urban socio-ecological and economic functioning through sustainable integrated energy, transport and resource efficient solutions, and to develop business models, innovative financing modalities and appropriate governance modes for integrated solutions including nature-based innovations. Large scale demonstration projects will be launched in cities, as 'living laboratories' for deployment, testing, replication and scaling up of innovative systemic and yet locally attuned solutions and thus provide evidence for economically, socially and environmentally viable alternatives to tackle simultaneously the various challenges which cities are faced with. This will help make the EU a world leader of a new market for sustainable, energy and resource efficient and nature-based solutions.
- The call on **Energy Efficiency** will give a strong boost in research and innovation investments to remove current technological and market uptake obstacles, by addressing the most pertinent technology-related issues across the energy value chain and non-technology issues. Particular attention will be given to the building area offering the biggest potential for improvement and to improving access to finance.
- The **Competitive Low-carbon Energy** call underpins the commitment to diversify energy sources and for Europe to secure a world-leading position in renewable energies by further advancing renewable electricity and heating/cooling technologies, smart electricity grids combined with storage technologies, the integration of the EU energy system, the development of sustainable biofuels and alternative fuels, the decarbonisation of the fossil fuel-based power sector, as well as non-technological challenges such as new financing and business models.
- Activities on climate-smart Europe will aim at steering a longer-term, broad, multi-disciplinary effort to come to an authoritative, IPCC-type, view on the most favourable scenarios and options for the decarbonisation of Europe by 2050. Actions will design feasible and cost-effective technological and non-technological options of deep decarbonisation pathways and address the consequences of those pathways with respect to the production and consumption of goods and services as well as the societal consequences and trade-offs in Europe and beyond. Support to the development of a pan-European market for cutting-edge customised climate services will enable public and private sector actors to mitigate climate risks, increase resilience, and take advantage of business opportunities.

A Deeper and Fairer Internal Market with a Strengthened Industrial Base

The internal market is one of Europe's best assets in times of increasing globalisation and provides a strong basis for our companies and industry to thrive in the global economy. The

next work programme will contribute to maintaining and reinforcing a strong and high-performing European industrial base and primary sector. The research and innovation activities will help maintain our global leadership in strategic sectors with high-value jobs by stimulating investment in new technologies, processes and business models, ease access to finance and up-scaling investment in the development of innovative skills. In particular, the following activities will contribute to this:

- The **Industry 2020 and Circular Economy** call will contribute to boosting and renewing Europe's industrial capacities, by taking a circular economy approach, ensuring economic, environmental and social sustainability and providing the basis to the transition towards a smart, dynamic, competitive, resource-efficient and low-carbon European industrial economy. Systemic solutions will be examined, developed and demonstrated throughout value chains, and by addressing all influencing factors. The engagement of industry is essential, but full success will depend upon a systemic approach, including new production, consumption and behaviour patterns, with strong multi-stakeholder and multi-disciplinary involvement and engagement of civil society.
- As an investment in strategies for earlier and more effective prevention, diagnosis and treatments, and for organising healthcare systems in a more efficient and sustainable way, the call on **promoting healthy ageing and personalised healthcare** will enable the EU to better understand the determinants of health, keep its population healthier for longer, preserve quality of life, deliver better healthcare at lesser costs and provide European life sciences industries, including SMEs, with a competitive edge that can secure growth and jobs.
- In a context of growing demand for resources and competition, sustainably capturing and demonstrating the potential of seas and oceans is critical to turn this potential into an asset for Europe. In the **Blue Growth** call, targeted innovation in our seas and oceans will demonstrate the commercial application of new technologies (algae bio-refineries, deep sea mining, multi-purpose floating platforms, new medicines) while respecting ocean ecosystems, and maximise synergies with activities funded at national and regional level. This has the potential to provide more jobs, growth, renewable energy sources as well as climate-smart and ecosystem solutions. Important contributions to bring technologies to readiness level for commercial applications for the generation of renewable energy in the marine environment (tidal, wind) in potential synergy with other sectors will also be provided.
- The **Sustainable Food Security** call will address resilience and resource efficiency in the primary sectors (agriculture, forestry, fisheries and aquaculture) and in the related up- and downstream industries to ensure the food and nutritional security of EU citizens. Investments in innovation will support stability and competitiveness of the agri-food chains, such as the food industry, the largest EU manufacturing industry. This call will also help to safeguard and make efficient use of the natural capital as the basis of primary sectors, while factoring in climate and environmental challenges.

Finally, the call will explore innovative approaches in the food value chain to empower citizens to change towards sustainable and healthy food consumption patterns and lifestyles.

- The **Mobility for Growth** call will contribute to further strengthening transport's role as the artery of the single market and vital contributor to EU competitiveness. It will support the world leadership of many of the Union's transport manufacturing companies, while seeking cost-effective long term solutions to key challenges, notably enhancing safety and reducing transport's dependency on fossil fuels. It will focus in particular on technology development and innovative solutions that will allow cleaner and smarter means of transport, as well as better inter-modal integration, improving the efficiency and resilience of logistics chains, and allowing greater choice to passengers. This will use ICT solutions that will in turn drive more efficient use of existing infrastructure with substantial safety improvements and energy savings.

Furthermore, key enabling technologies (KETs) supporting the development of new goods and services and the restructuring of industrial processes needed to modernise the EU industry as well as cross-cutting KET actions, given the potential of combined KETs to create unforeseen advances and new markets; and calls on innovation and business opportunities in the rural sector; and bio-based innovation for sustainable goods and services will also help strengthen Europe industrial base.

Calls and activities in vital areas such as satellite navigation, earth observation and satellite communication will help Europe to reap the benefits of European investments in the space sector and in doing so stimulate smart growth and provide opportunities for highly-skilled jobs. This is a long-term challenge that requires a long-term approach that must encompass several areas such as security of supply of component technologies, industry capability and technology readiness as well as space situational awareness to cope with threats such as space orbital debris (including space surveillance and tracking).

A Stronger Global Actor, Towards a New Policy on Migration, and An Area of Justice and Fundamental Rights Based on Mutual Trust

The strong international cooperation dimension of research and innovation will contribute to the policy area, *A Stronger Global Actor*. International cooperation calls and international cooperation targeted initiatives relating to societal challenges or Leadership in Enabling and Industrial Technologies (LEITs) developed on the basis of country/region roadmaps² and international policy dialogues with key partners will reinforce the European presence in partner countries, boost research and innovation cooperation and promote the position of Europe on the global scene. The **Border and external security** call will support the Union's external security policies in its civilian tasks, ranging from civil protection to humanitarian

² Report on the implementation of the strategy for international cooperation in research and innovation of 11 September 2014 – COM(2014)567 final.

relief, peace-keeping and post-crisis stabilisation, including conflict prevention, peace-building and mediation.

This call will also contribute to the policy area, *Towards a New Policy on Migration*. Europe needs to manage migration better, in all aspects, as shown by the recent events in the Mediterranean. The call will support border control authorities in their efforts to ensure the security of the EU external borders, whilst at the same time facilitating the legitimate flow of people and of goods.

The combat against cross-border crime and terrorism is a common European responsibility. The EU needs to crack-down on organised crime, such as human trafficking, smuggling and cybercrime. The calls **Fight against crime and terrorism**, **Privacy** and **Ethics** will contribute to the policy area, *An Area of Justice and Fundamental Rights Based on Mutual Trust*, by developing new technologies and innovative capabilities for fighting and preventing crime (including cyber-crime), illegal trafficking, and terrorism (including cyber-terrorism), and for understanding and tackling terrorist ideas and beliefs, while guaranteeing fundamental rights and values, including procedural rights and the protection of personal data.

4. Cross-cutting and other key features

While the majority of the calls for proposals will pertain to one objective of the *Specific Programme*, the Work Programme 2016-2017 will also contain focus area calls covering more than one objective. Focus areas address key areas of political relevance and societal concern to provide better solutions and enhance impacts through stronger integration across different work programme parts, in particular between the LEITs and the societal challenges. Those calls are targeted and evidence-based, and are set to provide sufficient scale and scope to achieve a critical mass of support on the basis of clearly defined objectives and impacts. They concern the following nine calls for proposals: Internet of Things, Automated Road Transport, Digital Security, Smart Cities and Communities with Nature-based Solutions, Energy Efficiency, Competitive Low-carbon Energy, Industry 2020 and Circular Economy, Blue Growth, and Sustainable Food Security. In addition to the priorities mentioned above, the following aspects will be embedded across the whole work programme within the calls for proposals and activities.

Substantial support for **innovation** and close-to-markets activities such as prototyping, testing, demonstrating, piloting, large-scale product validation and market replication will be provided. Demand side approaches will be reinforced, including further support to pre-commercial procurement and public procurement for innovation in suitable areas, in particular in the societal challenges, as well as policy tools and instruments to foster the market uptake of innovations, namely regulations and standard-setting. New forms and sources of innovation will be piloted, and a broad approach to innovation reinforced with more emphasis on aspects such as process, organisational, service and value chain innovation, social and public sector innovation or open innovation.

One other important instrument to be used is **inducement prizes**. They offer a reward for the completion of a set technological challenge that has not yet been achieved. They are a way of spurring interest in a particular issue, helping to attract new dynamic innovators to the area, mobilising additional private investment for research, and stimulating interest among the general public. One to two major inducement prizes are expected to be launched per year.

With 37% of topics in the Work Programme 2014-2015 flagged as being relevant to **social science and humanities (SSH)**, an important first step was made to fully embed SSH in Horizon 2020 to solve complex societal challenges. Learning from the first experiences, SSH embedding is being addressed upstream in the strategic programming for 2016-2017 so that it becomes an integral part of the conceptual design of calls for proposals. This work programme will focus on the quality of the description of SSH aspects and formulation in the calls for proposals. It will also widen the scope of the integration to cover a broader range of both social sciences and humanities to better understand and contextualise the development of certain (technological) solutions.

A particular effort was also made in the first Horizon 2020 work programme to mention **gender** issues in the scope of around 100 topics. This work programme will aim to identify new and more gender-related topics, to strengthen the quality of the integration of the gender dimension in research and innovation content, including in formulating the expected impacts statements. It will also identify specific studies which will bring a better understanding of the role of gender issues in addressing the various societal challenges. Furthermore the gender equality issues linked to female researchers' participation and careers will be reinforced in Excellent Science, in particular the ERC and MSCA. Finally, a particular attention will be given to researchers' training needs.

International cooperation ensures that European partners have access to talent and resources wherever they are located; that they can tackle global societal challenges effectively; that EU companies participate in global value chains and can access new and emerging markets and helps strengthen the EU's position as a major global player. Horizon 2020 is fully open to participation of entities from across the globe, and many topics will be flagged as being specifically relevant for international cooperation, identifying upfront the targeted area and partner country or region. Where appropriate financial incentives will be offered to ensure that the right international partners are attracted.

The approach to **climate action and sustainable development**, in support of the 35% and 60% respective expenditure targets, will be pursued and strengthened through upfront mainstreaming during strategic programming, and then during the development of the content of the work programme as well as the monitoring of the project implementation. Climate action and sustainable development form some of the key objectives of a number of calls under the societal challenges and LEITs.

As reflected in the **expected impact statements** of the calls for proposals, impact together with excellence are important elements of the work programme. Clearer and stronger expected impacts will be an important aspect of the preparation of the work programme.

Finally, complementing the work programme are the direct research activities carried out by the Joint Research Centre through its own work programme, the indirect actions of the Euratom Programme, of the ERC, the joint actions of the Public-Public Partnerships (P2Ps), and the work of the European Institute of Innovation and Technology (EIT) in its efforts to build Knowledge and Innovation Communities (KICs).

5. Next steps

On the basis of the Horizon 2020 *Specific Programme* and in line with the new Commission's agenda, this strategic programming document will provide guidance for the development of the content of the Work Programme for 2016-2017 in the first semester of 2015. Consultation of the Horizon 2020 Advisory Groups on input for the development of the content of the work programme will take place during the first quarter of 2015 followed by exchanges with Member States through the configurations of the Programme Committee during the second quarter of 2015 with the formal opinion expected towards the beginning of the summer. This will lead to the adoption of the Work Programme for 2016-2017 in the third quarter of 2015.

This strategic programming process also supports the work of future exercises. This aims at ensuring that Horizon 2020 continues to be relevant by adjusting priorities and resources, and to react to new challenges as well as significant shifts in the political, economic and social landscape in the EU and globally. Strategic programming will thus continue to be used to make real impact and pave the way for ground-breaking scientific advances.

Annexes

Annex 1 – Strategic Programming Process for 2016-2017

Annex 2 – Scoping paper for Future and Emerging Technologies (FET)

Annex 3 – Scoping paper for Marie Skłodowska-Curie actions (MSCA)

Annex 4 – Scoping paper for European research infrastructures (including e-Infrastructures)

Annex 5 – Scoping paper for Information and Communication Technologies (ICT)

Annex 6 – Scoping paper for Nanotechnologies, Advanced Materials, Biotechnology, and
Advanced Manufacturing and Processing

Annex 7 – Scoping paper for Space

Annex 8 – Scoping paper for Access to Risk Finance

Annex 9 – Scoping paper for Innovation in SME

Annex 10 – Scoping paper for Health, demographic change and well-being

Annex 11 – Scoping paper for Food security, sustainable agriculture and forestry, marine,
maritime and inland water research, and the bioeconomy

Annex 12 – Scoping paper for Secure, clean and efficient energy

Annex 13 – Scoping paper for Smart, green and integrated transport

Annex 14 – Scoping paper for Climate action, environment, resource efficiency and raw
materials

Annex 15 – Scoping paper for Inclusive, innovative and reflective societies

Annex 16 – Scoping paper for Secure Societies - protecting freedom and security of Europe
and its citizens

Annex 17 – Scoping paper for Spreading Excellence and Widening Participation

Annex 18 – Scoping paper for Science with and for Society

Strategic Programming Process for 2016-2017

The strategic programming process provides a coherent and integrated approach for the preparation of the Work Programme for 2016-2017, and help set priorities by taking into account new intelligence on scientific, technological, economic, market and social trends and foresight, as well as emerging policy needs within the current political context.

A broad consultation was launched in spring 2014 seeking inputs from a wide range of external stakeholders, including those reflecting wider societal views. Within a common framework, different consultation methods and instruments depending on the area were used ranging from targeted consultations of specific categories of stakeholders including European Innovation Partnerships, European Technology Platforms, contractual Public Private Partnerships, Joint Programming Initiatives, the Enterprise Policy Group, as well as civil society, where appropriate, to seminars, workshops, etc. Information on how the consultation has been conducted and how the results have been taken into account is included in the scoping papers.

As part of this, the Horizon 2020 Advisory Groups set up following Article 12 of the Horizon 2020 Regulation were consulted on a common set of questions, including foresight evidence on relevant drivers of future change and their potential for impact on growth. Each advisory group produced during summer 2014 a report of their key findings. All the reports are made publicly available on the Commission Register of Expert Groups.

Member States through the Strategic configuration of the Programme Committee were also consulted in spring 2014 to provide early input, in particular on the proposed criteria for selecting the priorities to be supported in the Work Programme 2016-2017, within the context of the Horizon 2020 *Specific Programme*. They concerned:

- **Maximising EU added value** by focusing on areas which cannot effectively be addressed at national level; mobilising resources to build scale and critical mass; improving leverage and synergies with national programmes; and aligning with major EU level political initiatives and objectives;
- **Priority areas addressing and anticipating key trends** on the basis of available evidence, foresight and other assessments of research and innovation trends and market opportunities; building on existing research, innovation and business strengths; and identifying areas of high potential for world class breakthroughs;
- **Providing strong potential for impact and uptake and leverage industry and SME participation** by addressing the longer-term competitiveness and prosperity of the EU; defining impacts addressing the demand side, tackling the barriers to innovation and market deployment and uptake; and building collaborations between industry, businesses, universities and research institutions, public authorities, etc.;

- **Addressing key novelties and providing genuinely cross-cutting approaches** by embedding key novelties such as covering the full research and innovation cycle, social science and humanities, gender aspects, climate and sustainable development; and integrating challenges and areas cutting across different specific objectives and parts of Horizon 2020;
- **Improving international cooperation** by focusing on key strategic and targeted areas of common interest and mutual benefit.

Following the consultation with stakeholders, and exchanges with the Member States through the configurations of the Programme Committee, the strategic programming document has been provided on the basis of the assessment of all the information gathered and inputs received to identify those areas providing the strongest potential for impact at EU level, and alignment with EU policy needs within the current political context.

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