



European
Commission

HORIZON 2020 SOCIETAL CHALLENGE 2 STAKEHOLDERS' CONSULTATION 2016

*Research and
Innovation*

1. Introduction

Societal Challenge 2 of Horizon 2020 covers the area of "Food Security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy".

This paper provides the basis for the consultation of Horizon 2020 Societal Challenge 2 stakeholders and citizens at large concerning potential priorities for EU research and innovation funding in the work programme 2018-2019/2020.

The Horizon 2020 Specific Programme¹ sets the scope and content for the implementation of the Framework Programme for research and innovation (2014-2020).

On this basis, DG RTD, DG AGRI and other associated European Commission Directorates-General prepare multiannual work programmes - the first Horizon 2020 work programme covering 2014-2015 was adopted on 10 December 2013² and the second one covering 2016-2017 was adopted on 13 October 2015³.

The preparation of the work programme 2018-2020 includes an open public consultation with the stakeholder community. Commission services through DG RTD and DG AGRI for Societal Challenge 2 are also consulting their Advisory Groups and other stakeholders, such as European Technology Platforms, European Innovation Partnerships, Joint Programming Initiatives, contractual Public-Private Partnerships and other representatives from professional organisations and civil society. An exchange with the Member States on first priorities for the 2018-2020 Work Programme has taken place through informal workshops run in the first part of 2016, and will continue in the second part of the year through formal interactions in the

¹ <http://eur-lex.europa.eu/legal-content/EN/ALL/?;jsessionid=Hz9LT9YfkCSqFW01qycdsPv71IXDP2sc1mrRb7ZyhYn6Y49c874z!-2080490876?uri=CELEX:52011PC0811>

² http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-food_en.pdf for part 9 of the Horizon 2020 Work Programme on Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

³ http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-food_en.pdf for part 9 of the Horizon 2020 Work Programme on Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

Societal Challenge 2 configuration of the Programme Committee. On the basis of the priorities identified through these consultation processes, the Commission expects to develop a set of strategic priorities for 2018-2020 in the second half of 2016 and the content/topics of the work programme 2018-2020 in 2017.

2. Key strategic considerations for strengthening the added value of EU actions

With its emphasis on addressing societal challenges and key technologies, covering the full research and innovation cycle, facilitating collaborative and industry-driven research, reducing time to market and further strengthening excellence, Horizon 2020 provides powerful opportunities to develop new knowledge and innovative products and services, creating growth and jobs in Europe.

The thematic content of the Specific Programme has to be translated into Work Programmes that deliver on these goals, making full use of the European added value that transnational collaboration can deliver. In this regard, prioritisation is needed a priori, and the implementation of activities needs to be optimised.

This consultation aims at helping identify the potential areas and actions which could be rolled-out in the next Work Programme, taking into account the specificities of Societal Challenge 2, and in addition, major drivers such as demographic change, ageing population, digitalisation, globalisation, resource constraints, climate change and environmental concerns; mobilising resources to build scale and critical mass; exploiting well-developed research and innovation agendas; and securing world class scientific and innovative breakthroughs.

3. Context of consultation

Delivering on the Europe 2020 objectives of smart, sustainable and inclusive growth depends on research and innovation as key facilitators of social and economic prosperity and of environmental sustainability. Linking EU research and innovation closer to policy objectives sets the framework and specific objectives to which Horizon 2020 research and innovation funding should contribute, such as the Europe 2020 Strategy, the Innovation Union and other flagship initiatives.

The general objective of Horizon 2020 will be pursued through three priorities dedicated to generating excellent science, creating industrial leadership, and tackling

societal challenges. While the Specific Programme defines the specific objectives and rules for implementation for the duration of the framework programme, it does not define how these objectives are translated into specific actions, the sequence to roll-out of the actions or how to optimise the specific actions in view of the broader and horizontal objectives - i.e., its contribution to growth and jobs, the European added value and their framing in the context of research performed at Member States and international level.

4. Priorities in the work programmes for 2014-2015 and 2016-2017

In the first two Horizon 2020 work programmes (2014-2015, and 2016-2017), the overriding priorities were – and still are – to boost competitiveness and support the creation of jobs and new sources of growth. A strong emphasis was placed on addressing societal challenges with high potential for sustainable competitiveness, innovation and growth. Reflecting the strong challenge-based approach of Horizon 2020, the Work Programme invited applicants to come up with innovative solutions, attracting more multi-disciplinary, multi-actor and multi-sectoral proposals.

The 2014-2015 Work Programme for Societal Challenge 2 paved the way for these objectives with three calls⁴. The Focus Area *Sustainable Food Security* provided incentives for improving food production and processing, as well as land management supporting natural resources such as soil and genetic resources and for working on the global drivers of food security. It also addressed the Common Agricultural Policy and the new Common Fisheries Policy and the "zero discard" target. The Focus Area *Blue Growth* targeted four main areas: sustainable exploitation of the diversity of marine life, new offshore challenges, ocean observation systems/technologies and horizontal activities for innovation, communication and society's engagement. The call on *Innovative, Sustainable and Inclusive Bioeconomy* targeted the delivery of public goods by agriculture and forestry, the supply side of the biomass to bio-products value chain through the development of innovative feedstock, research on next generation bio-refineries, and supporting markets for bio-based products. These activities had been complemented by the Joint Technology Initiative on Bio-based Industries (JTI BBI)

⁴ http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-food_en.pdf

since 2014. Finally, several horizontal activities were promoted with aim of valorising research outcomes, engaging with society, strengthening the European Research Area.

In the second Horizon 2020 work programme, which covered 2016-2017, Horizon 2020 Societal Challenge 2 addressed the following challenges through 4 calls⁵:

a) Sustainable Food Security – Resilient and resource-efficient value chains

According to the FAO, to meet food demand to feed a global population projected for over 9 billion by the year 2050, a 60% increase in global agricultural production and a 50% in global aquaculture production by 2030 are necessary relative to 2005. And this challenge has to be met in the context of increasing resource scarcities while minimizing food safety risks and adapting to/mitigating climate change. Actions under Horizon 2020 Societal Challenge 2 aimed at developing win-win solutions that bring together the primary sector and the food industry, considering nutrition, health, water and energy efficiency, zero waste and environmental sustainability in a holistic way

b) Blue Growth – Demonstrating an ocean of opportunities

Over 90% of the ocean habitat is in the deep sea and less than 10% of this has been explored. To unlock the potential of seas and oceans across the wide range of marine and maritime industries, actions under Horizon 2020 Societal Challenge 2 required an integrated approach, ensuring a responsible management of resources, maximising synergies between activities and boosting growth and employment in coastal areas - which is expected to increase €1,5 Million by 2020.

c) Rural Renaissance – Fostering innovation and business opportunities

Rural or semi-rural areas represent about 88% of EU territory and account for 46% of the Gross Value Added and 55% of jobs. Horizon 2020 Societal Challenge 2 aimed at setting the right framework conditions and developing key skills will be critical to foster innovation in rural areas, helping them generating economic activities and coping with the various dimensions of sustainability.

d) Bio-based innovation for sustainable goods and services – Supporting the development of a European Bioeconomy

⁵ http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-food_en.pdf

The various sectors accounted under the bioeconomy are already worth €2 trillion in annual turnover and account for more than 22 million jobs, and their potential is still greater. For example, it has been estimated that the volume growth of EU bio-based chemical products could be over 3% per year up to 2020, resulting in a market worth €40 billion and 90,000 new jobs. Furthermore, the food industry is the largest industrial sector in the EU. Actions under Horizon 2020 Societal Challenge 2 aimed at fully developing their full potential to grow, with new businesses and industries emerging in both traditional and novel non-food sectors.

In the second work programme, further efforts were also made to ensure cross-cutting issues (e.g. social sciences and humanities, gender, international cooperation) had been integrated in each of the different parts of the Work Programme, ensuring an integrated approach.

5. Policy priorities for the work programme 2018-2020

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 Commission's agenda for jobs, growth, fairness and democratic change is a strong response to the challenges we face. This implies 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 Juncker Commission sets out ten policy areas on which the EU needs to focus its efforts over the five year period. 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. Migration is also a policy priority. The 10 Juncker priorities can be found here: http://ec.europa.eu/priorities/index_en.htm

Research and innovation represent major drivers to both stimulate and leverage investment, providing new solutions and knowledge, which will help deliver the new Commission's agenda.

Commissioner for Research, Science and Innovation Carlos Moedas has emphasised the importance of 'Open innovation', 'Open science' and of being 'Open to the world'. In general, Horizon 2020 is fully open to participation of entities from across the globe. Challenges in areas like energy, health, food and water are global challenges, and Europe should be leading the way in developing global research and innovation partnerships to address these. To remain competitive Europe needs to engage more with partners in global value chains and in new and emerging markets.

Open innovation is characterised by the combined power of ideas and knowledge from different actors (whether private, public, third sector) to co-create new products, services and business models, to respond to societal needs. Creating and supporting an Open Innovation ecosystem encourages dynamic knowledge circulation and facilitates the translation of that knowledge into socio-economic value.

Open Science describes the on-going transitions in the way research is performed, researchers collaborate, knowledge is shared, and science is organised. It is enabled by digital technologies, and driven by the enormous growth of data, the globalisation and enlargement of the scientific community including new actors (e.g. citizen science), and the need to address societal challenges. In the short term, Open Science may offer more transparency, openness, inclusiveness and networked collaboration. In the long term, it may make science more efficient, reliable and responsive to the grand challenges of our times as well as foster co-creation and Open Innovation.

The speed and scale of digitalisation are accelerating and transforming the way we design, develop and manufacture products, the way we deliver services, and the products/services themselves. It is enabling new innovation processes and new ways of doing business, introducing new cross-sector value chains and infrastructures. Horizon 2020 actions can play an important part in merging the physical and digital worlds, notably by maximising the synergies between digital technologies and innovative solutions to societal challenges. Many synergies are already in place, but there are growing opportunities and challenges.

Climate change and sustainable development are important cross-cutting priorities for the whole of Horizon 2020, as evidenced by the expenditure targets linked to these objectives⁶. In an evolving political context – the Juncker Commission's priorities of growth and jobs, the agreement at the climate change conference in Paris in December 2015, the adoption in September 2015 of the UN's 2030 Sustainable Development Agenda with its related Sustainable Development Goals (SDGs), EU policies such as the Commission's new Circular Economy Package or the 2030 Climate and Energy Framework, and the current context of migration – there is a clear and timely political imperative for research and innovation to support and drive forward on these key issues.

6. Questions

Building on the first two Horizon 2020 work programmes 2014-2015 and 2016-2017, this consultation will feed into the preparation of the next work programme.

This will enable a more integrated approach, particularly important for areas that cut across different Horizon 2020 parts and for linking key enabling technologies to their application in addressing societal challenges and vice versa.

In particular, the consultation is aimed at providing input towards the priority setting for EU research and innovation funding on the most relevant and urgent challenges for Food and Nutrition Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research as well as the bio-based industries and the Bioeconomy in the coming years, identifying the main opportunities and bottlenecks, as well as highlighting possible outputs and defining criteria to measure success.

Stakeholders should quote where relevant any available evidence such as foresight and other assessments of research and innovation trends and market opportunities.

⁶ The Horizon 2020 Regulation states: *"Climate action and resource efficiency are mutually reinforcing objectives for achieving sustainable development. The specific objectives relating to both should be complemented through the other specific objectives of Horizon 2020. As a result it is expected that at least 60% of the overall Horizon 2020 budget should be related to sustainable development. It is also expected that climate-related expenditure should exceed 35% of the budget, including mutually compatible measures improving resource efficiency."*

With regard to agricultural research (activity 2.1 of the specific programme for Societal Challenge 2), the present consultation will be complemented with results obtained through recent stakeholder engagement via online surveys and events, notably in the context of a major conference held in January 2016⁷.

The following questions are proposed:

Information about the respondent

Fields marked with * are mandatory.

* 1. Are you responding to this questionnaire on behalf of/as:

- An individual
- A single organisation
- A network of organisations

* 2. Please enter your name or the name of your organisation

300 character(s) maximum

* 3. Please enter your e-mail address (this data will not be made public)

* 4a. Please indicate the type of organisation represented

- Not applicable (if individual)
- Higher education establishment
- Primary and/or secondary education
- Academy of science or technology
- International research centre

⁷ Conference: "Designing the path: A strategic approach to EU agricultural research and innovation", 26 – 28 January 2016

- Public research centre
- Private/commercial research centre
- Private non-profit research centre
- Non-research public sector
- Non-research private non-profit
- CSO (Civil Society Organisation)
- Non-research international organisation
- Non-research commercial sector including SMEs
- Consultancy
- Science museum or science centre
- Media sector
- Other

Please specify the type of your organisation if 'Other':

4b. Transparency Register ID

If you are answering as an organisation/institution, please provide your Register ID number. If your organisation/institution responds without being registered, the Commission will consider its input as that of an individual and as such, will publish it separately.

* 5. Have you or your organisation applied for funding under the current and/or any previous EC Framework Programmes for Research (e.g. H2020, FP7, FP6)?

- Yes
- No

* If so, please specify under which programme(s) (e.g. FP7 - KBBE)

* 6. Please enter your country of residence or where your organisation is based.

- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Italy
- Ireland
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands

- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- United Kingdom
- Non-EU country:

* 7. Language of your contribution

* 8. Do you agree to your contribution being published under your name or the name of your organisation?

- My contribution can be published under the name indicated
- My contribution can be published anonymously
- I do not agree that my contribution is published

9. Gender (this data will not be made public but used for statistical purposes only)

- Female
- Male

* 10. Year of birth - e.g. 1975 (this data will not be made public but used for statistical

purposes only)

Open questions

11) What are the challenges in the areas covered by Societal Challenge 2 that require urgent action under the Work Programme 2018-2020?

12) What are the desired output and long term-impacts that could be foreseen for Societal Challenge 2? Which innovation aspects would be needed to respond to our societal needs and market development within the next 5-7 years?

13) In the areas covered by Societal Challenge 2, which gaps (scientific and technological, innovation, markets, policy, societal) and potential game-changers, including the role of the public and private sectors in accelerating changes, need to be taken into account?

14) Which of the areas covered by Societal Challenge 2 could benefit from integration of horizontal aspects such as the social sciences and humanities, responsible research and innovation, gender aspects, and climate and sustainable development?

Closed questions:

15) Agriculture is a crucial sector when it comes to tackling major challenges such as food security, safeguarding natural resources, protecting climate as well as the development of food/non-food industries and rural areas. A number of cross-cutting issues are suggested to implement a broad research agenda which takes into account the numerous challenges as well as the diversity and different needs of the agricultural sector. Please categorise the following list of issues according to their relevance for delivering innovations in agriculture and rural areas (1= low relevance; 2= relevant; 3 = highly relevant):

- Focus on "systems approaches", i.e. taking into account dynamic interactions of the different components of systems and value chains (e.g. agro-ecosystems, food value chain) at various temporal and spatial scales.

- Focus on "smart" innovations, i.e. delivering tailor-made solutions and capitalising on specificities of local conditions (e.g. taking advantage of novel ICT driven tools)

- Promote co-creation of knowledge as well as new mechanisms and models of knowledge exchange (i.e. partnerships between science, farming, other businesses, consumers)
- Promote Open data to drive knowledge creation, management and sharing
- Foster science-policy and science- societal interfaces at all stages of the research and innovation cycle (agenda setting, activity implementation, outreach activities)
- Foster international cooperation

16) What is the most pressing marine challenge to be addressed through research and innovation in the next Work Programme:

- a) upscaling and commercialising innovations from marine products and services?
- b) preventing and reducing marine litter?
- c) investigating and managing land-sea interactions?
- d) studying the carbon cycle in coastal regions?
- e) analysing ocean circulation changes and other changes such as caused by acidification on fisheries and aquaculture?
- f) providing food security – fisheries/aquaculture aspects?

17) Food and nutrition security is about building sustainable '**Food systems**', which include the entire 'value chain' from inputs (land, soil, water), to primary production (agriculture, aquaculture & fisheries), harvesting, storage, processing, packaging, distribution, waste streams, to consumer intake – and back. Food and nutrition security goes beyond the production of sufficient food for all, but also respond to the need to provide safe and nutritious food for healthy and sustainable diets. Please rank each of these food and nutrition security priorities in order of importance with respect to future research and innovation needs:

- a. Reducing hunger and malnutrition, addressing food safety and diet-related illnesses, and helping citizens adopt sustainable diets and healthy lives

- b. Building a climate and global change-resilient primary production system
- c. Implementing sustainability and circular economy principles across the whole food system
- d. Boosting innovation and investment, while empowering communities