



*FORESIGHT*

# Strategic Foresight in EU R&I Policy

## Wider Use – More Impact

Report of the Expert Group  
'Strategic Foresight for R&I Policy in Horizon 2020'



Research and  
Innovation

**EUROPEAN COMMISSION**

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## EXECUTIVE SUMMARY

The remit of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' (SFRI), which was active between June 2015 and November 2016, was to *'support the strategic approach to research programming in Horizon 2020 through the provision of foresight intelligence and rapid response sense-making of signals that change in society, economy, and technology, is occurring on issues deemed relevant for strategic programming in Horizon 2020 and research and innovation policies in general.'*<sup>1</sup>

The recent increase of unexpected crises and the complexity and urgency of the extraordinary policy challenges they give rise to, highlights the fact that foresight<sup>2</sup> must not be a luxury. Indeed, more than ever before in history, foresight has become an essential pre-requisite for proactive, informed and collective action. Foresight provides a systematic approach to support a deeper reflection on where changes of policy direction are needed, how to engineer required transitions, flagging potential barriers, and meaningful engagement and empowerment of end users.<sup>3</sup>

Foresight processes and advice at European level are not developed in a vacuum but complement and compete with other strategic policy advice mechanisms, including for example informal expert groups, Horizon 2020 Advisory Groups,<sup>4</sup> the Scientific Advice Mechanism (SAM)<sup>5</sup> and the Research, Innovation and Science Expert Group (RISE).<sup>6</sup> The added value of foresight is to provide analysis in terms of forward-looking framing of key challenges (for example, transition to the bio economy, the migration-climate change nexus, Industry 4.0) through the consideration of trends and weak signals of change, sense-making of these trends and weak signals, the exploration of alternative scenarios and through co-design processes.

The Expert Group worked on four work streams to develop:

- Foresight guidelines for strategic programming of research, in particular in support of the next Framework Programme (cf. bringing foresight closer to the policy-making process).
- An operational plan for a flexible and informal European network of foresight experts for research, science and innovation policy that could address the Commission's need for strategic intelligence and sense-making.
- A 'Rapid Response'-Mechanism (RRM). This included the provision of pilot rapid response sense-making of signals that change in society, economy, and technology is occurring on issues deemed relevant for R&I policy.
- A frame for the better use of foresight in selecting R&I topics and doing R&I policy in a bottom-up, inclusive mode.

Concluding from its work the Expert Group highlights:

a) the **need for the next Framework Programme (FP) to use foresight to play a more strategic role in shaping and enabling transformative policy processes**, working hand in hand with citizens and local communities. Much has been said elsewhere on the promises and practices of ICT in stakeholder and citizen participation. In several Member States as well as in multinational activities (for example, Joint Programming Initiatives), experiments are underway to embed research programmes more effectively in policy practices and to strengthen connectedness with citizens and stakeholders, not only in the execution but through the co-design of research and innovation programmes. The current arrangements for R&I programming are under reform everywhere and the next FP might be the place where a lot of these experiments and results come together.

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<sup>1</sup> See for the group's mandate: <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3332&NewsSearch=1&NewSearch=1>.

<sup>2</sup> The term 'foresight' is often used in 'loose' sense, referring to all kinds of forward-looking activities, both participatory and non-participatory. In this report, the term foresight is used in the strict sense, i.e. referring to participatory approaches only, however, using any of the relevant methods available.

<sup>3</sup> The concept of foresight to engineer desired transition is addressed in K. M. Weber, J. Cassingena Harper, T. Könnölä, V. Carabias Barceló (2012), 'Coping with a fast-changing world: Towards new systems of future-oriented technology analysis', *Science and Public Policy*, 39(2), 153-165.

<sup>4</sup> See <http://ec.europa.eu/programmes/horizon2020/en/experts>.

<sup>5</sup> See <http://ec.europa.eu/research/sam/index.cfm>.

<sup>6</sup> See [http://ec.europa.eu/research/innovation-union/index\\_en.cfm?pg=expert-groups](http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=expert-groups).

b) that **foresight needs to drive a widespread shift in policy-making** at EU, global and national level, which includes moving from short-term to long-term perspectives and policy choices that better link actors both on a vertical (between different levels of policy-making/governance) and a horizontal (between policy areas or policy-making bodies) axis. Such an approach would help preparing decisions with a long-term view, with a strong emphasis on considering their long-term effects.

c) that **foresight** does not only need to anticipate emerging changes, provide visioning and engineer required transitions, but also **to underpin the building of necessary innovation ecosystems** to implement the transitions. In order for research and innovation to have an impact in practice, it is essential to build the innovation ecosystems that provide the supportive environments for innovations to flourish and disseminate widely. These environments are as much subject to change as the innovations themselves, and they are shaped by a broad range of actors.

The Expert Group puts forward the following **key recommendations** to address the three needs above:

a) **Ensure the development of appropriate procedures to systematically integrate foresight throughout the next FP.** Make sure that foresight is firmly embedded in the procedures of preparing and implementing the FP, i.e. before any specific research priorities are set and policy decisions are taken, and also before the overall orientation of the FP is defined.

b) **Develop the capacity to provide rapid forward-looking responses to support policy co-design:** invest in a 'Rapid Response'-Mechanism which is efficient in co-ordinating and executing rapid responses on developments with significant future repercussions and enable it to advise proactively on issues highly relevant for the next FP.

c) **Develop the capacity as well as the organisational and institutional arrangements to foster the use of Inclusive Foresight in the next FP** to achieve the targeted transitions. The next FP needs to engage more closely with citizens who feel they are becoming increasingly disconnected from governments. Inclusive Foresight calls for projects, which are co-conceived, co-designed and co-implemented by citizens, local communities, and other stakeholders reflecting their priorities, their challenges, and their solutions.

d) **Set up a Strategic Foresight Network** as an independent EU-wide think tank to liaise with national foresight actors, citizens and stakeholders (i.e. support foresight community building), to provide strategic intelligence and analysis of future signals and trends, and to foster the improvement of the practical use of foresight.

The Expert Group held seven plenary meetings. Additionally, two workshops have been organised in Brussels, one on the 'Rapid Response'-Mechanism on 27 October 2015 and one on 'Democracy 2.0' on 8 June 2016. The outcome of those workshops was duly taken into account in this report. This final report is structured along the following lines: emerging rationales for foresight in R&I policy preparation, a new role for foresight in European R&I policy, impact-oriented foresight (with a focus on the different work streams); conclusions and recommendations (in particular in view of preparing the next Framework Programme).

The Expert Group would like to thank the European Commission's network of foresight correspondents and the foresight team in DG RTD for their valuable, constructive and continuous input to the group's work.

The report reflects the views only of the Expert Group, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.

# 1 Rationales for using foresight in R&I policy

## 1.1 Fostering integrated policy responses

The past couple of years have witnessed an unprecedented surge of major crises in Europe and worldwide with unforeseen current and, as yet, future unknown impacts on the economy, politics and society. The policy context has become more complex due to the domino effect linking crises to long-term challenges relating to – for example - health, climate change, migration and growing tensions between global, European Union, national, regional and local levels of policy-making and action. The difficulties to come up with appropriate and integrated responses across a range of policy areas to such complex and intertwined challenges have brought the EU and national policy-making bodies to its limits. They have shown that our preparedness to manage situations of increasing unpredictability, instability and complexity is in serious need of development. Of even greater concern is the fact that deep-rooted causes of societal discontent and distrust among citizens and communities reflect a widespread loss of confidence in current policies and decision-making bodies.<sup>7</sup>

Political systems are currently in crisis, but this pressure could serve as trigger of positive change, if it is used for constructive ends.<sup>8</sup> The established role of experts and scientific advice in policy-making is in question and in need of a major rethinking to accommodate multiple voices, perspectives and alternative policy solutions and pathways. The current policy landscape is moving from a 'business as usual' outlook to a new reality of on-going disruptions, which are largely unforeseen and unplanned, and which are currently mainly addressed in a short-term, reactive mode. The concern is not only the urgency to provide solutions to these upcoming challenges, but the growth of serious societal conflicts related to values, political views and institutions.<sup>9</sup> These disruptions affect the foundations of our societies.

At a time of accelerated technological and social change, it is not sufficient any more to define political frameworks in a reactive manner. In recent years, national governments and EU decision-making bodies have had an increasingly challenging task of keeping up with a fast-changing reality and coping with policy-making in real time. Anticipation of possible futures has now become essential to contribute (pro-)actively to the shaping of preferred pathways. In doing so, more has to be invested in foresight and futures activities and to mainstream the use of foresight in policy design. Secondly, more engagement with citizens is needed because they feel being increasingly disconnected from their governments. Reactive politics and policies largely focus on improving current practices, but citizens are losing trust because they do not consider this improvement as progress anymore. On the contrary, they fear regression and the supremacy of so-called elites who are not willing to take responsibility for this regression. Possible futures are not a technical but a purely political issue concerning narratives on comprehensive views, norms, values and the good life. But for public authorities to become connected with citizens, there is first of all a need for facts, figures and deep insights – especially those that concern citizens. Here foresight can help in co-creating desired futures for and with citizens.

## 1.2 Addressing extraordinary policy challenges

Along the backdrop outlined above, EU R&I policy-makers are currently faced with key dilemmas:

- a) Long-term challenges that require urgent, yet deeply insightful policy action in order to induce desired 'evolutionary system change' (for example, in relation to climate change, the bio-economy, ageing and demographic change, obesity, etc.); and
- b) Unexpected or sudden developments, which policy-makers as well as society need to anticipate and prepare for in a rather short time span, calling for fast action to cope with 'disruptive (system) change' (for example in relation to security, migration, Industry 4.0, but possibly also digitisation, robotisation, artificial life, etc.).

Both types are transformative, but on different time scales.

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<sup>7</sup> K.Stewart, T. Dubow, J. Hofman, C. van Stolk (2016), Social change and public engagement with policy and evidence, Cambridge: RAND (available at [http://www.rand.org/content/dam/rand/pubs/research\\_reports/RR1700/RR1750/RAND\\_RR1750.pdf](http://www.rand.org/content/dam/rand/pubs/research_reports/RR1700/RR1750/RAND_RR1750.pdf)); European Commission (2017), Trust at Risk: Implications for EU Policies and Institutions, Brussels: European Commission (available at <https://bookshop.europa.eu/en/trust-at-risk-pbK10417105/>).

<sup>8</sup> G. Falkner (2016), 'The EU's current crisis and its policy effects: research design and comparative findings', *Journal of European Integration*, 38(3), 219-235.

<sup>9</sup> See, for example, European Commission (2016), *European Values Changes: Signals, drivers, and impact on EU research and innovation policies*, Brussels: European Commission (available at <https://bookshop.europa.eu/en/european-value-changes-pbK10216597/>).

- c) A third dilemma is the time-lag and inertia in governance processes i) for tackling these challenges, ii) in transforming the processes for handling these challenges and iii) in engaging on these issues in a relevant and effective way with society. Research and innovation investments do not always render expected results in time to address these types of transformative changes, particularly to meet the expectations of policy-makers and the citizens.

This calls for a significant shift in the policy approach, and not only from short-term to long-term, but towards better aligned<sup>10</sup> policy choices by engaging more closely with citizens and communities. The real challenge for policy-makers (at all territorial levels) in this shift is to develop more effective mechanisms to rediscover and engage with citizens and (local) communities. Uncertainty requires greater efforts to co-design futures jointly with citizens in order to get political legitimation, political engagement and to foster trust in the state and its institutions. This requires a strong drive to integrate co-design and sense-making processes<sup>11</sup> into EU strategic policy-making to achieve the targeted transitions.

The nature of the challenges ahead requires the alignment of actions by several actors at different levels of policy-making to improve policy coherence and impact. The key point is that foresight serves as a deliberative tool for facilitating a convergence of opinions, strategies and agendas for action.

### **1.3 Reconciling urgency and reflection**

Better aligned policy choices depend on the introduction of co-design and co-creation mechanisms of policy design, in particular for enabling multi-level (linking global, regional, national and local levels) and bottom-up approaches to work effectively, and to work fast. It is essential to arrive at shared overarching aims and principles, relating, for instance, to human rights and values, or the kind of social balance we want in society. This is of course not an easy task because multiple rationales need to be taken into account in policy design within a short timeframe, and they place further pressure at an EU level. Policy-makers contend with a complex reality of often interconnected challenges, differing member state (regional/city) perspectives and policies, as well as potentially divergent academic and business needs, vested interests, and local/citizen discontent and mistrust. Policy-making can be further hampered by organisational and institutional inertia, fragmentation, lock-in and tight timeframes.

Foresight is often misconceived as a luxury what policy-makers in crisis mode can ill-afford, because it requires resources and time and yet might offer irrelevant, unclear or untimely results. While foresight is not a panacea, it embeds a more systematic and robust approach to facilitate policy co-design in a complex environment. Foresight processes build on a powerful combination of strategic anticipatory intelligence, sense-making, visioning, scenario development and deep participatory engagement. The Expert Group is of the opinion that foresight is no longer to be considered a luxury. Indeed, more than ever before, foresight has become an essential pre-requisite for proactive, informed and collective actions to stimulate participation of a wider set of actors and dialogue between them.

There is a trade-off here between the need for rapid anticipation and early engagement of government, on the one hand, and the need for more time to deliberate and consult, on the other. Foresight can play a key role in providing the means for at least partially reconciling that trade-off by:

- a) starting the debates earlier in the transformation process to gain time, and
- b) involving the stakeholders in public debate and co-design.

In times of political and economic uncertainty, the social contract and public trust in government is at risk. There is a strong need to engage in deeper public debate and participation because the uncertainty is first and foremost stemming from a lack of agreement on views, values, and visions.

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<sup>10</sup> 'Aligned' refers to a) efforts to improve coherence between different levels of policy-making (global, EU, national and local), b) the inclusion of citizens, and c) across different Commission Directorates-General.

<sup>11</sup> In general, 'sense-making' is an effort to understand relations between people, places, and events in order to create mental models, which then enable anticipation of behaviour and action. It combines activities that analyse the results of intelligence gathering on which basis evidence-based options are generated (see EFFLA (2013), 'Sense-Making for DG Research and Innovation (DG RTD)', Policy Brief No. 11, p. 2; [https://ec.europa.eu/research/innovation-union/pdf/expert-groups/effla-reports/effla\\_pb\\_11\\_-\\_sense-making\\_for\\_dg\\_research\\_and\\_innovation.pdf](https://ec.europa.eu/research/innovation-union/pdf/expert-groups/effla-reports/effla_pb_11_-_sense-making_for_dg_research_and_innovation.pdf)).

It is fully understandable that politicians do not accept that participatory processes prescribe the way forward for them, as this is perceived as a denial of the political role. Foresight, however, by definition does not prescribe actions; rather it provides facts, arguments and options for politicians and society at large to devise potential ways forward.

#### **1.4 Underpinning the preparation and implementation of EU Framework Programmes**

Foresight can underpin the strategy processes of defining and implementing the EU Framework Programmes. Where there is a need for advice to develop proactive approaches and collective action, foresight has the potential to inform policy-making as follows:

- **Devising strategy** when deep reflection on a new policy direction and agreement on common overarching goals to address disruption, inertia and desired transitions and redefining values is required. In this context, foresight can help exploring the landscape of a new challenge and shed light on the related risks and opportunities of alternative policy strategies.
- **Priority setting** by providing foresight evidence to make informed choices and taking difficult decisions. Foresight can support long-term decisions on prioritisation or de-prioritisation in particular when there is a need for higher levels of selectivity in terms of R&I investments and European added value.
- **Respecting time constraints.** Most policy-makers have to work in a 'dual mode', addressing short-term crises, whilst taking the long-term consequences of their action into consideration. Foresight enables this 'dual mode' by taking a long-term view as starting point for factoring in multiple future pathways to inform current policies.
- **Linking different levels of governance.** Foresight methods have the potential to mobilise different configurations of actors and stakeholders ('horizontal mobilisation') at different territorial levels ('vertical mobilisation') at the right moment in time to trigger co-ordinated action. In doing so, foresight processes a) enable citizens and communities to contribute to the definition of opportunities and challenges, as well as to solutions to address those, and b) consider varying decision-making competences at global, EU, national, regional or local levels.

## **2 Foresight as an enabler to build innovation ecosystems**

Our world has been shifting from a 'flat' to a much more complex landscape, with unexpected developments arising that escape our established ways of thinking and decision-making. The phenomena include globally as well as locally inter-connected challenges such as climate change and migration, but also transformative changes of our social and technological lives, such as those triggered by digitisation. These developments confront our current way of thinking in terms of policy design and implementation. It is not surprising that a lot of citizens and local communities are struggling to cope with these changes and are losing confidence in current political and economic systems. The Expert Group argues that there is not only a need to anticipate these emerging challenges and societal changes but also to build the necessary innovation ecosystems needed to create the solutions to address these. Such ecosystems build on the emergence of new research and innovation practices and changes in policy structures and practices.<sup>12</sup> They can also be co-designed to help develop a stronger connectedness between policy-makers, citizens and local communities.

These innovation ecosystems can be of very different types, each raising different requirements. First of all, many of our innovation ecosystems are built around large-scale infrastructures and systems of provisions (e.g. in relation to energy, water and food supply, but also mobility) that need to be transformed in view of long-term challenges related to sustainability. In these cases, the transformation needs to take place in real-time and during full operation, but with high uncertainty about the outcomes of the transformation. This requires a high degree of political will, coherence and alignment at different levels.

Secondly, there are new types of innovation ecosystems continuously emerging, often driven by scientific and technological developments, where qualitatively new kinds of products and services are created. For example, Industry 4.0 heralds a new era for manufacturing, with major

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<sup>12</sup> According to the concept of innovation ecosystems, innovations are perceived as the results of the 'right' interaction among actors in order to turn an idea into a solution or bring a product or service onto the market. Innovation ecosystems are driven by economic, social, ecological or political challenges (High-Level Group on Innovation Policy Management (2014), Inspiring and Completing European Innovation Ecosystems. Blueprint, Brussels).

repercussions (opportunities and risks) for the economy, society and the production system.<sup>13</sup> Digitisation, while also transforming existing systems, has brought about a range of new opportunities for which there was no equivalent in the past. Users tend to play a very important role in shaping these innovation ecosystems.

Thirdly, there are social developments that give rise to a need for innovation and major changes in society and economy. They can have their origin at global level, but affect the European Union in a very significant way such as in the case of the recent migration flows, aging, unemployment, security, but they can equally have their origin within society, such as the erosion of trust in our democracies.

Public authorities are expected to handle these challenges and enable the building of new innovation ecosystems. Moreover, in times of eroding trust in public bodies it is important to manage change that gives citizens and stakeholders an appropriate role in decision-making. There is a growing demand for, and necessity of, strengthening the bottom-up component of setting strategies, including citizen participation.

The key issue is whether it is sufficient to just provide framework conditions and incentives for innovation, or whether public administrations need to adopt a more proactive role in shaping and spearheading the building of innovation ecosystems.<sup>14</sup> At the same time, we have to accept that we cannot anticipate and plan for everything, but the risks of not taking action is too high – we can ill afford a 'wait-and-see' attitude. More room for experimentation is, therefore, needed.

The strategic use of foresight to address deep complex changes at an EU level and the need for stronger citizen engagement in policy preparation, calls for a new role for foresight in designing and building innovation ecosystems. In this context, foresight can be customised to play the following roles:

- Provide fast and early insights into newly emerging challenges, which Europe is likely to be confronted with more frequently and more severe than in the past;
- Facilitate the alignment of policies between local, national and EU level to connect policy-makers more closely to citizens and communities;
- Open up new arenas for debating the need for policy interventions and lend legitimacy to policies and institutions by enabling mutual learning and shared assessments of future challenges and opportunities;
- Build coherent visions that can serve as orientation for action at different levels of governance and across different policy domains;
- Engage networks of actors and stakeholders through inclusive foresight;
- Provide tools for supporting the process of prioritisation of research and innovation policy at national and EU levels.

In essence, the Expert Group proposes a foresight facility, which supports the Commission's forward-looking activities from the policy preparation phase to the policy implementation phase (e.g. enabling the building of innovation ecosystems).

In line with this proposal, the next section describes the novel mechanisms that need to be put in place to be able to respond quickly to emerging new challenges, to mobilise foresight networks at EU, national and regional levels, and engage new actors, for example young entrepreneurs, students, change agents, and local activists, for an enhanced bottom-up approach in policy-making.

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<sup>13</sup> See the 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers' for a paper on 'Industry 4.0'.

<sup>14</sup> Mazzucato, M. (2013), *The Entrepreneurial State – Debunking Public vs. Private Sector Myths*, London: Anthem Press.

### **3 Impact-oriented foresight for R&I policy: three core activities**

Earlier work by the European Forum on Forward Looking Activities (EFFLA)<sup>15</sup> on embedding foresight in EU R&I policy-making suggested a four-phase strategic decision-making cycle, and stressed the importance of foresight in the second-phase, that is, sense-making.

However, following the arguments outlined in the previous section, restricting foresight to the early policy preparation phase is not enough if the ambition is to ensure that EU R&I policy generates the desired impacts. Foresight can also support the policy implementation phase and underpin the process of building and transforming innovation ecosystems.

This has implications for the types of forward-looking activities to be considered at EU level. Up to the now, EU decision-making bodies have mainly relied on prospective studies that are largely expert-based and analytical in nature, or on conventional participatory forms of foresight that relied mainly on the contributions of experts and expert-stakeholders, but with no or less emphasis on involving citizens. Both kinds of activities tend to take a long time until results become available, and they neglect the value of distributed futures knowledge in society.

We therefore recommend enhancing the effectiveness of the core processes of policy preparation and policy implementation through three new types of forward-looking activities, which – until now – have not been sufficiently exploited at an EU level.

#### **Activity 1: 'Rapid Response'-Mechanism<sup>16</sup>**

Based on foresight methods and knowledge the 'Rapid Response'-Mechanism (RRM) aims to identify and explore emerging trends, challenges and possible solutions to newly emerging and pressing issues on the policy agendas. It is the essence of the RRM to deliver inputs quickly and under time pressure, primarily in an early phase of sense-making and policy preparation but possibly also in the course of innovation ecosystem formation, for instance in case of newly arising developments of an unexpected nature.

The RRM process enables a network of relevant external experts to provide forward-oriented input in a short timeframe to the European Commission with two aims: (a) to provide direction and alternative policy options and solutions on a high-stake policy issue that has emerged as a priority and that requires urgent responses; and (b) to help validate and complement EU research priorities.

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<sup>15</sup> EFFLA (2012), Enhancing strategic decision-making in the EC with the help of Strategic Foresight, Policy Brief No. 1; EFFLA (2012), How to design a European foresight process that contributes to a European challenge driven R&I strategy process, Policy Brief No. 2.

<sup>16</sup> See the 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers' for further details.

**BOX 1: 'Rapid Response' Mechanism Pilot on 'Security Aspects in Future R&I Policy'<sup>17</sup>**

The SFRI Expert Group had set up a small sub-group to address DG RTD's RRM request for advice on future R&I policy responses in the area of security. The process focused on a literature review and extracting key trends and drivers of the future security landscape drawing on on-going and completed projects. The group reflected on the challenge of addressing different perspectives and understandings of the notion of security as an area of research, as a policy imperative and from the individual and societal perspective. The group developed an overview of the context and dynamics of the new and changing security landscape and how this will impact on EU research and innovation policy, tracing links between threats, risks, and opportunities. A set of structured policy responses in the short, medium and long-term was recommended. The paper has been discussed within the SFRI Expert Group and with Commission services.

Key insights for Horizon 2020 and the next FP highlight the need for a dedicated approach to security entailing:

- a comprehensive, joined up approach due to the interconnectedness of threats and risks and the opportunities inherent to societal security.
- a more flexible, dynamic and anticipatory planning and programming cycle, allowing quick shifts to address new and emerging threats, risks and opportunities.
- more participatory processes involving end users in co-design of security solutions providing sufficient space for piloting bottom-up approaches involving communities, local groups and young people.
- a strong emphasis on risk- and threat-identification systems with early detection and prevention.
- a focus on effective end products is of particular importance in this strategic priority sector and could be incentivised through different measures including top-up funds for high quality replicable solutions as well as on-going local community initiatives.

The RRM provides EU policy-makers with timely and effective support in addressing decisions related to urgent crisis situations and emerging risks, as well as windows of opportunities for resolving on-going policy challenges and concerns. It does not claim to replicate the in-depth quality of longer-term reflection, study and consultation. Instead, according to the time windows available, it can adjust to provide the response required, when it is required, with the best resources and intelligence available at the time.

In practice, the RRM draws on scanning of existing sources (for example, data-mining and advanced analytics of existing foresight databases), rapid data collection techniques (such as online enquiries, social media analysis and workshops), and a long-developed ability to synthesise a broad spectrum of knowledge (often individual tacit knowledge) and to connect it to current policy agendas.

In the R&I context, the types of deliverables that can be expected include:

- Short-term input to respond to decision-making urgencies, political urgencies (such as unexpected events), or procedural urgencies (such as deadlines on a special thematic input).
- Input to the framing and selection of R&I priorities.
- Input to the development and validation of new strategic directions in R&I programmes and policies.

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<sup>17</sup> See the 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers' for the full 'rapid-response' paper.



## Activity 2: Inclusive Foresight<sup>1819</sup>

While the participatory approach is a defining feature of foresight, forward-looking work has also been deployed by the Commission in a non-participatory mode. In this section the emphasis is on participatory approaches, which can be equally valuable in policy preparation and in policy implementation. On-going Framework Programme foresight activities address different levels of policy-making from global to local, but are largely top-down. Efforts have been made to enhance bottom-up foresight activities. In the CIMULACT Project,<sup>20</sup> for example, the perspectives of citizens are given priority in co-creating EU research agendas based on real, validated and shared visions, needs and demands. However, the main emphasis to date has focused on engaging citizens in pre-defined agendas and societal challenges identified top-down. The real challenge for the next FP will be the extent to which citizens and local communities can be provided the space to set their own agenda, design their own activities and engage stakeholders relevant to them.

In daily routines, long-term developments, goals and ambitions are often forgotten and therefore not taken into account when decisions are taken. In addition, policy has generally focused on the supply of scientific and technological knowledge as sources for innovations, but often, the needs-orientation is missing. Societal issues and the practical preparation for changes are habitually ignored. We do not know the needs of the future – but we can anticipate some of them. A number of problems that will need to be solved are well known and provide us orientation for action: needs can be derived from them. But whose needs are they? Are they really the needs of the citizens? There are contentious policy issues and challenges, such as migration, GMOs, Artificial Intelligence, which are debated extensively in rather narrow expert circles at the EU and national levels, but which would benefit from perspectives by local stakeholders.

In most cases, policy-makers listen to intermediaries, researchers, business people, and sometimes to associations or NGOs. But these stakeholders synthesise the issues already at a higher level of abstraction. If democracy is taken seriously, individuals should also have a say in deciding what is important. Diversity of perspectives rather than singular opinions provide a way forward in averting societal discontent and distrust in governance systems. There is already a movement claiming the right of the public to shape policies. There is a lot of discontent with the current way of policy-making in general: many people feel ignored. These people ask for 'Democracy 2.0' with (real life) experimentation, living (policy) labs and being taken seriously with their opinions. This change is already on-going, anyway, and must therefore not be ignored.

The Expert Group is of the opinion that there is a need to shift to a new form of Inclusive Foresight, which is not only strongly participatory but also combines bottom-up, multi-perspective and multi-level approaches. Inclusive Foresight calls for initiatives which are co-conceived, co-designed and co-implemented by citizens and local communities with other actors and which reflect their priorities in relation to EU, national and global challenges and opportunities. This can be implemented through an incremental approach which builds on individual research and innovation projects as the basis for developing a more mainstreamed R&I policy approach.<sup>21</sup>

Inclusive Foresight puts a strong emphasis on sense-making for building shared perspectives on current and future challenges and opportunities and the way forward in terms of implementation. Sense-making benefits from the perspective of a diverse range of actors and stakeholders, including those that might potentially be negatively affected by an emerging development. When building or transforming innovation ecosystems, it is essential to have actors with different backgrounds and perspectives on board who are likely to be able to influence that ecosystem from a research, innovation, industrial, societal or policy perspective. As many of the major challenges of the future are to be addressed in a multi-level (EU, Member States, regions) and multi-domain policy space (involving different policy fields), foresight can be a valuable mechanism for bringing

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<sup>18</sup> 'Inclusive Foresight' goes beyond 'Foresight 2.0' (web-based foresight) by combining bottom-up, interactive, multi-perspective and multi-level approaches to support co-design and co-creation of policies. For a definition of Foresight 2.0 see Schatzmann, J., Schäfer, R. & Eichelbaum, F. (2013), 'Foresight 2.0 - Definition, overview & evaluation', European Journal of Futures Research, 1:15. doi:10.1007/s40309-013-0015-4.

<sup>19</sup> See the 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers' for further details.

<sup>20</sup> The Horizon 2020 project CIMULACT (Citizen and Multiactor Consultation on Horizon 2020; <http://www.cimulact.eu/>) has as a main objective to add to the relevance and accountability of European research and innovation – Horizon 2020 as well as national - by engaging citizens and stakeholders in co-creation of research agendas.

<sup>21</sup> EFFLA (2012), How to Involve Member States in Forward Looking Activities at European Level, Policy Brief No. 10. [https://ec.europa.eu/research/innovation-union/pdf/expert-groups/effla-reports/effla\\_pb\\_10\\_-\\_how\\_to\\_involve\\_member\\_states\\_in\\_forward\\_looking\\_activities\\_at\\_european\\_level.pdf](https://ec.europa.eu/research/innovation-union/pdf/expert-groups/effla-reports/effla_pb_10_-_how_to_involve_member_states_in_forward_looking_activities_at_european_level.pdf).

the players on board whose interests really matter, namely citizens, communities, regions and marginalised groups, who make these initiatives work.

### **BOX 2: Workshop on 'Democracy 2.0: Foresight for better R&I Policy'<sup>22</sup>**

As part of the bottom-up foresight stream, the SFRI Expert Group has organised an interactive mutual learning workshop with the participation of additional external experts in the areas of participatory approaches in policy development, trend analysis, and citizens' empowerment at local level. The aim has been to illustrate foresight processes and tools for programming and policy design in the context of 'Democracy 2.0'. 'Democracy 2.0' refers to transformations of political systems that involve much more deliberative policy-making and public participation in governance. These elements are becoming increasingly important for R&I policy. Participants have been tasked to develop a concept of bottom-up foresight for the Commission, identify relevant actors and introduce tools, policies, programmes, skills etc. that can help embed the bottom-up approach in future-oriented thinking in R&I policy.

#### Key insights:

(1) To engage citizens closer to the policy-making process and apply a co-design approach, it is not sufficient to simply ask for citizens' opinions on a pre-designed R&I programme. One additional element could be participatory budgeting, which is already applied in number of cities. Cities could be encouraged to join collaborative initiatives with the aim to launch their own activity.

(2) The participatory approach and process is not suitable for all policies, and thus the most suitable policies need to be selected. While looking for the most relevant actors in the participatory process, it is important to take into account citizens groups that might seem to be not relevant at present but that might be affected by specific policies in the future. In order to obtain lay opinion, a mining of media is an option.

(3) Using a 'top-down approach for bottom-up solutions' means that policy-makers and politicians create a framework that empowers citizens and utilises space in between government (top-down) policies and citizens initiatives (bottom-up). It is crucial to build trust between politicians, policy-makers and citizens by focusing on communication, outreach and implementation that takes into account the 'voice' of society. When talking about tools for empowering citizens, the focus should be put on education and skills development for both policy-makers and citizens. There have been successful experiences with living labs.

#### Key recommendations for the Commission:

- Provide space to citizens' initiatives to develop and to engage in policy-making;
- Use existing community organisations to get closer to citizens;
- Work on skills rather than tools; tools are to be selected according to needs, objectives and the idea;
- Experiment more with living labs;
- Citizen-centred foresight that will inform the R&I policy is an adventure but it is worth to be tried!

### **Activity 3: A Strategic Foresight Network<sup>23</sup>**

Complexity and disruption, the growing call for empathy in understanding societal priorities and expectations, together with the need to co-design with citizens effective measures and frameworks to address key societal challenges shape the evolving new framework for EU R&I policy. This calls for the setting up a foresight network to provide the Commission with effective support in decision-making (through shaping relevant questions to decipher the challenges ahead, and providing proper answers to address them) in a changing and complex environment. The SFRI Expert Group highlights the importance and relevance of an open, flexible and independent network linked to EU R&I policy-making serving as a professional intelligence entity. The main role of the network would be to trigger bottom-up processes, stakeholder engagement and rapid responses for dual purposes: long-term and short-term support with an emphasis on enabling proactive policies, based on strategic intelligence.

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<sup>22</sup> See the 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers' for the full workshop report.

<sup>23</sup> See document 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers' for full paper.

### **BOX 3: Strategic Foresight Network: envisaged objectives, tasks and activities**

#### Key objectives:

Creating synergies is the key point: the network should aim at collaborative efforts of policy-makers, academics, entrepreneurs and citizens at large to anticipate possible futures, to formulate a shared vision and to approach effectively (and collectively) identified challenges. In such a network new ideas and knowledge emerge from a continuous interaction and feedback loops among individuals, who influence each other.

#### Key tasks:

- a) provide foresight intelligence: the network will provide response to the Commission's need for strategic intelligence and analysis of weak signals, early warnings and major trends (through linking up with specific think tanks).
- b) support foresight community building of public, private and academic actors by running workshops, seminars and training courses.
- c) trigger mutual learning: the network will contribute to creating and sharing cutting-edge foresight knowledge and experiences and thus improve the relevance and practical use of foresight.

#### Key activities:

Scanning of foresight sources should be a central activity, but also the periodical dissemination of results (for example via conferences, media and journals) and training activities (for example, workshops, experimental activities) in a structured calendar.

In order to prove effective, the design of the Strategic Foresight Network should provide an operative framework able to generate both long-term (proactive) and short-term (contingent) intelligence-based support to decision-making according to the tasks and activities described in Box 3. This should be done by using participatory processes in order to generate empathy with societal needs and citizens' expectations. The operational framework could take the form of an independent think tank, with a small group of independent professionals specialised in foresight and strategy development at its core. The members are appointed by, and report to, the Commission but are also able to act as a liaison with national foresight providers, citizens and stakeholders. The think tank could set up small and focused ad-hoc groups in which foresight experts and thematic specialists participate. In cooperation with the Commission the think tank could pay special attention to rapid response actions, focusing not only on technical facts and figures, but also on sense-making of observed signals of change and societal trends.

For global outreach, the think tank could engage in organising a global network of foresight experts in order to build a community of practice, which works in a solution-oriented and proactive manner.

## **4 On the way to the next Framework Programme: conclusions and recommendations**

Framework Programmes for research and innovation are future- and problem-oriented, and by definition these programmes create 'policy and deliberation' time for hot political issues and contested developments. They need to provide high impact and impact-oriented responses to upcoming trends and uncertainties more than ever. The Expert Group refers here to the long-standing and increasing societal, economic and political turbulences that the EU has to face. The three types of forward-looking activities we have proposed in section 3 will be helpful to make the future Framework Programme more impact-oriented and by that more effective.

The problem with past FPs is not so much with what they have done (i.e. funding a lot of valuable research), but with what they should have focused on. There has been a significant emerging trend of thematic continuity in FPs since their inception in the 1980s, leading to funding lock-ins, which prescribe non-negligible parts of the FP portfolio. This constrains the extent to which FPs can be proactive and responsive to emerging and more long-term crises and opportunities.

Future FPs should empower excellent basic research, but undoubtedly be more selective. The next FP needs to put more emphasis on addressing disruptions and incidents, on transitions and progress in science and technology, and (even more than Horizon 2020) on the impact of the programme on policy, society, markets, and infrastructures. It is important that a solid basis for creating a diversity of new inroads through research is maintained in the next FP (the role of ERC), with 'excellence' as the criterion to distinguish good from less good ideas.

At the same time, it is likely that the next FP will be increasingly challenged in terms of its responsiveness and efficacy with regard to current and future developments and disruptions. For that reason, its embeddedness in transformative (policy) processes in society and markets is becoming more and more relevant. Being proactive and simultaneously embedded in policy is a prerequisite for ensuring impact as well as connectedness from the early beginning to the very end of the policy process, with stakeholders and citizens closely engaged. Meanwhile, future FPs are strongly in need of preserving freedom of research in the drive to address societal challenges. Without freedom, no progress can occur. The designers of the next FP have to safeguard freedom as well as impact and embeddedness.

On the way towards the next FP the Expert Group highlights:

- a) the **need for the next FP to use foresight to play a more strategic role in shaping and enabling transformative policy processes**, working hand in hand with citizens and local communities. Much has been said elsewhere on the promises and practices of ICT in stakeholder and citizen participation. In several Member States as well as in multinational activities (for example, Joint Programming Initiatives), experiments are underway to use research results more effectively in policy practices and to strengthen connectedness with citizens and stakeholders, not only in the execution but through the co-design of research and innovation programmes. The current arrangements for R&I programming are under reform everywhere and the next FP might be the place where a lot of these experiments and results come together.
- b) that **foresight needs to drive a widespread shift in policy-making** at EU, global and national level, which includes moving from short-term to long-term perspectives and policy choices that better link actors both on a vertical (between different governance levels) and a horizontal (between policy areas or policy-making bodies) axis. Such an approach would help preparing decisions with a long-term view, with a strong emphasis on considering their long-term effects.
- c) that **foresight** does not only need to anticipate emerging changes, provide visioning and engineer required transitions, but also **to underpin the building of necessary innovation ecosystems** to implement the transitions. In order for research and innovation to have an impact in practice, it is essential to build the innovation ecosystems that provide the supportive environments for innovations to flourish and disseminate widely. These environments are as much subject to change as the innovations themselves, and they are shaped by a broad range of actors.

The SFRI Expert Group puts forward the following key recommendations, based on the three activities identified in section 3, to address the above three needs:

- a) **Ensure the development of appropriate procedures to systematically integrate foresight across the next FP** before research priorities are set and policy decisions are taken.
- b) **Develop the capacity to provide rapid foresight responses to support policy co-design.** Invest in a 'Rapid Response'-Mechanism, which is efficient in co-ordinating and executing rapid responses on developments with significant future repercussions and enable it to advise proactively on issues highly relevant for the next FP.
- c) **Develop the capacity as well as the organisational and institutional arrangements to foster the use of Inclusive Foresight in the next FP** to achieve the targeted transitions. The next FP needs to engage more closely with citizens who feel they are becoming increasingly disconnected from state and government. Inclusive Foresight calls for projects that are co-conceived, co-designed and co-implemented by citizens, local communities and other stakeholders reflecting their priorities, their challenges, and their solutions. This can be implemented through an incremental approach which builds on individual research and innovation projects as the basis for developing a more mainstreamed R&I policy approach, through introducing pilot activities driven by local communities and citizens, and through investing in futures literacy and related skills and training.
- d) **Set up a Strategic Foresight Network** as an independent EU-wide think tank to liaise with national foresight actors, citizens and stakeholders (i.e. support foresight community building), to provide strategic intelligence and analysis of future signals and trends, and to foster the improvement of the practical use of foresight.

## Annex 1: List of Expert Group's Background Papers

All papers are available in the document 'Report of the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' – Background Papers'. All papers have been finally endorsed by the entire group.

1.	Forward-Looking Rapid Response (FRR) as a support for R&I policy-making' <i>Authors: Marguerite Grandjean (editor), Robby Berloznik, Blaz Golob, Luis Valadares Tavares</i>
2.	Rapid Response on 'The use of foresight in scientific advice'
3.	Rapid Response on 'Security aspects in future R&I policy'
4.	'Forward-looking activities and strategic programming: A practical guide for designing the next Framework Programme' <i>Authors: Attila Havas (editor), Jennifer Cassingena-Harper, Augusta Maria Paci, Ahti Salo, Matthias Weber</i>
5.	'Outline for an effective foresight network in support of EU research and innovation policy' <i>Authors: Enric Bas (editor), Natalie Dian, Blaž Golob, Michal Pazour, Jurgita Petrauskiene, Ahti Salo, Jan Staman, Luis Valadares Tavares</i>
6.	'A frame for selecting bottom-up topics' <i>Authors: Kerstin Cuhls (editor), Robby Berloznik, Jennifer Cassingena-Harper, Natalie Dian, Michal Pazour, Tal Soffer</i>
7.	Workshop report 'Rapid Response Mechanism'
8.	Workshop report 'Democracy 2.0 - Foresight for better R&I policy'
9.	'Industry 4.0: The new production paradigm and its implications for EU policy' <i>Author: Kristel Van der Elst</i>

## Annex 2: List of Expert Group Meetings & Workshops

Name	Date
1st Plenary Meeting	3 June 2015
2nd Plenary Meeting	23 September 2015
1st SFRI Workshop: Rapid Response Mechanism	27 October 2015
3rd Plenary Meeting	22 December 2015
4th Plenary Meeting	15 March 2016
2nd SFRI Workshop: Democracy 2.0 – Foresight for better R&I Policy	8 June 2016
5th Plenary Meeting	21 June 2016
6th Plenary Meeting	13-14 September 2016
7th Plenary Meeting	30 November 2016

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The recent increase of unexpected crises and the complexity and urgency of the extraordinary policy challenges they give rise to, highlights the fact that foresight must not be a luxury. Rather foresight is an essential prerequisite for proactive, informed and collective action. Foresight supports deeper reflections on where policy changes are needed, guides required transitions, and helps engaging and empowering citizens.

The SFRI Expert Group puts forward suggestions on how to use foresight more strategically and with more impact on the R&I policy process, which should head towards a shift from short-term to long-term perspectives and policy choices. Within this strategy foresight does not only anticipate changes, provide visioning and suggest scenarios, but it underpins the building of new innovation ecosystems.

*Studies and reports*