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Visions for Horizon 2020 from Copenhagen Research Forum

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Purpose

In January 2012, the Copenhagen Research Forum (CRF) gathered 80 European scientists to discuss the societal challenges to be addressed by Horizon 2020, the next framework programme for European research and innovation, and consider how research could contribute the best solutions. This EFP brief explains the process behind the CRF and gives a summary of recommendations. It ends with a discussion on cross-disciplinarity and strategic partnerships as tools for organising research in order to solve complex societal challenges.

Visions for Horizon 2020 – from Copenhagen Research Forum

The EU Commission's proposal for a new framework programme, Horizon 2020, is devoted to strengthening the strategic organisation of European research and innovation. The ambition is to mobilise excellent scientists across various branches of knowledge in order to provide solutions for complex societal challenges.

The Copenhagen Research Forum (CRF) set out to assemble a broad spectrum of leading European scientists to give their view on the Commission's choice of societal challenges and possible ways of implementing

Horizon 2020 as a means of tackling them. Approximately 600 scientists contributed throughout the process.

The CRF recommendations clearly affirm the EU Commission's selection of societal challenges as well as the idea of supporting cross-disciplinary collaboration as a means to address crosscutting problems within and across challenges. The recommendations also send a strong signal of support for a framework where excellence, cross-disciplinarity and simplicity in administrative processes are key components.

The following pages provide an overview of the process behind the CRF, the main recommendations as well as a discussion of new instruments to be implemented to support cross-disciplinarity.

The CRF Process

The main idea behind CRF was to involve a broad spectrum of Europe's top-level researchers in the making of Horizon 2020 since part of its preparation would take place during the Danish EU presidency in the first half of 2012.

The University of Copenhagen, Technical University of Denmark and the Capital Region of Denmark wanted the scientific community to provide unbiased input to Horizon 2020, with the aim of making Horizon 2020 as attractive as possible to researchers working in the areas covered by the six societal challenges. Professor Liselotte Højgaard was appointed as Chair of CRF.



The concept was finalised in the summer of 2011. The key issue was that CRF should convey ideas, visions and comments from outstanding researchers, all of whom were invited personally to join CRF. A full list of names of conference participants may be found in the CRF report (see link on the last page).

The process comprised several steps and organisational roles:

Chairship – This involved contacting researchers for the six groups and establishing a chairship comprised of one Dane and one European researcher for each challenge:

- Health: Professor Liselotte Højgaard MD, DMSc and Professor Deborah Smith.
- Food & Agriculture: Professor Peter Olesen and Director Kees de Gooijer.
- Energy: Dr. Jørgen Kjems and Professor Kjell Hugo Bendiksen.
- Transport: Head of Dept. Niels Buus Kristensen and Programme Director Dr. Christian Piehler.
- Climate & Resources: Professor Katherine Richardson and Professor Johan Rockström.
- Society: Professor Ole Wæver and Professor Loet Leydesdorff.

The six panel chairships were asked to invite up to 100 researchers to offer their views in a virtual discussion forum. Out of the invitees, 15 researchers from each group were also asked to meet at a workshop conference in Copenhagen on 16 January 2012 shortly after the Danish EU presidency began.

Virtual discussion forum – Divided equally between the six societal challenges, the 600 researchers were invited to comment on the draft text of Horizon 2020. The researchers were asked to contribute personal visions for the future as well as point out needs and possible solutions. They were also asked to suggest

and comment on the technologies and the priorities within the given challenge as well as consider the instruments and implementation needed to ensure success as seen from a scientific perspective. Lastly, they were requested to contribute their ideas on how to secure the link between research and the innovation perspective stressed in Horizon 2020. All of the input was collected in a draft report that formed the basis of the aforementioned conference in Copenhagen.

Conference – On 16 January 2012, the six panels met and discussed the draft report, offering comments and adding new ideas inspired by the input collected in the virtual discussion forum. The aim was to reach agreement on (1) the views and recommendations in each of the six panels, (2) a joint statement during plenary sessions expressing the view on scientific issues cutting across all six challenges and (3) recommendations for the implementation of a challenge-oriented framework as a basis for excellent research and far-reaching solutions.

The Danish Minister of Science, Innovation and Higher Education, Morten Østergaard, attended the conference.

Outcome – The conference resulted in a condensed report offering ideas and solutions that could help form Horizon 2020 from a scientific point of view. The conclusions were presented to the European community in an open dialogue as explained in the following.

Dissemination – The CRF recommendations were presented to the EU Council of Ministers' meeting in Copenhagen on 1 February 2012 and subsequently to the European Commission, the European Parliament as well as directly to Director General for DG Research and Innovation, Robert Jan Smits. The dissemination activities were closely connected to the Danish EU presidency.

In the following section, we provide key statements from the CRF panels' recommendations. A full version can be found in the report.

Key CRF Recommendations for Each Societal Challenge

Health, Demographic Change and Wellbeing

- Biomedical research and its implementation in clinical practice must be supported and accelerated. This requires a paradigm shift towards personalised medicine.
- The global revolution in biomedicine is providing new technologies. Utilising those technologies requires vast efforts to expand and implement them.
- A European platform engaging all key stakeholders to ensure discovery and delivery of these technologies will be crucial.
- Establishment of a European Strategic Action for Healthier Citizens is also recommended to assist in

strategic long-term healthcare research and planning, including preventive measures and the spread of best practice across Europe.

Food Security, Sustainable Agriculture, Marine and Maritime Research and the Bio-economy

- Overriding challenges of increasing demand, competition for land use and other resource scarcities create massive pressure to produce significantly more per unit of a given resource.
- Food, agriculture and land use must be seen in a complex and multi-directional value chain encompassing climate, available resources, environmental sustainability, transport, energy and health perspectives, not to mention social and economic requirements.

- Key objectives are reductions in food waste and water consumption, valorisation of all bio-resources, including municipal bio-waste and agro- and bio-industrial side streams as well as the recycling of sufficient amounts of carbon and phosphorus to maintain soil vitality.
- Increasing prevalence of diet-related diseases and disorders calls for a balanced healthcare concept more geared towards prevention.
- There is a need to create a collaborative innovation culture linking researchers, companies (especially SMEs), university education, NGOs and governments.

Secure, Clean and Efficient Energy

- Horizon 2020 priorities should build on (1) a revised Strategic Energy Technology Plan (SET Plan), including a critical update of technology road maps and (2) a new, complementary systemic approach to combine technological, economical, political, social and cultural research to facilitate the transformation of the energy system as a whole.
- Collaboration of social sciences and humanities with 'hard sciences' must be recognised as necessary and organised and funded accordingly to meet the challenges at the system level.
- Coupling of educational efforts with research and innovation is critical for realising the ambitious plans for technology implementation and the overall system transition agenda.
- Direct mobilisation of universities in addressing systemic challenges should be given high priority.

Smart, Green and Integrated Transport

- The complexity of transport challenges requires closer cooperation across scientific domains and integration across universities, research institutions and industry than in the past.
- Meeting the challenge of developing smart and green transport systems requires not only technological solutions but also a better understanding of transport behaviour and the use of innovative and effective policy instruments.
- This calls for a more pronounced role for the social sciences than in previous framework programmes as well as for strengthening the integration of scientific domains.
- Technological innovation will still be of paramount importance, including cleaner and safer vehicles for all transportation modes, cost-effective alternative fuels, advanced ICT for personalised real-time travel information with modal integration, metropolitan traffic management and smart payment systems.

Climate Action, Resource Efficiency and Raw Materials

- Climate change constitutes one of the most urgent global resource challenges facing society, where the resource in question is our atmosphere as a receptacle for greenhouse gas wastes.
- Development of actions and strategies for dealing with this challenge can potentially provide models for dealing with resource scarcity issues (biodiversity, ecosystem services, water, phosphorus, ores and metals etc.).
- A general paradigm for dealing with resource scarcity is reducing the need for – and more efficient use of – the resource, combined with the adaptation of human activities to changed conditions and/or the recognition of resource scarcity.
- In dealing with resource scarcity in general and the climate in particular, a major challenge is to channel the knowledge gained on the mechanisms of the Earth's system into political and societal action. This requires cross-disciplinary approaches that integrate natural sciences with other disciplines.
- The focus of Horizon 2020 should thus be to underpin societal responses to climate challenges by including research on systemic interaction, collecting baseline information and establishing monitoring activities of different mitigation and adaptation approaches.

Inclusive, Innovative and Secure Societies

- The focus on 'inclusive, innovative and secure societies' provides a highly welcome challenge to the social sciences and humanities (SSH).
- The Horizon 2020 proposal tends to focus on 'hard' technologies, especially statistics, assessments and measures of efficiency (evidence-based lessons), with a corresponding tendency to employ a technocratic definition of the nature of the challenges (e.g. in the security part, critical infrastructure protection is prioritised over international politics).
- This represents a limited political and social vision that underestimates the power of citizens and communities to contribute to the realisation of inclusion, innovation and security.
- Corresponding to a vision comprising a broader mobilisation of societal energies are forms of research that employ a wider selection of methodologies and theories to study the dynamics of society as productive and generative, rather than as the site of problems to be solved.
- SSH can play key roles in the other societal challenges as well. It is important that researchers in the SSH engage scholars in the hard sciences in a joint effort to cultivate research-based innovation regarding the way expertise and democracy interact.

Excellence, Cross-disciplinarity and Simplicity

The ambition of using societal challenges as a means to organise European research requires new approaches. The message from CRF is to pursue this through a combination of excellence, cross-disciplinarity and administrative simplicity.

The CRF report signals a strong will among scientists to enter into cross-disciplinary collaborations in order to address complex challenges for which no single discipline has the solution. But this must not violate an equally strong need for administrative simplification and a continued effort to support excellence in all research activities. Without excellence as a fundamental requirement in all programmes, the cross-disciplinary ambition may become a hollow and strange add-on to 'real' science. Whenever a problem calls for a disciplinary approach, this should not be substituted with cross-disciplinarity. Timely application of new approaches must be a key priority.

Strategic Partnerships as Tools for Organising Cross-disciplinary Collaboration?

One of the ways in which cross-disciplinarity may enter the Horizon 2020 programme could be by establishing strategic partnerships devoted to delivering solutions to complex challenges. Strategic partnerships could be a way for the Horizon 2020 programme to nurture new constellations of fields of expertise without establishing very detailed road maps or other guidelines 'from above'. It would be important to involve industrial and civil society actors in the formulation of strategic objectives in order to ensure that strategic partnerships become platforms for linking strategic priorities from science, policy, industry and other actors and that these partnerships organise collaboration accordingly.

A key feature of implementing strategic partnerships should be to provide them with sufficient operational freedom so as to secure flexibility and entrepreneurship in how partnerships pursue their goals at the project level.

Strategic partnerships should be an invitation and challenge to European research to explore new models of collaboration. This corresponds also with a clear recommendation from the CRF advocating the setup of strategic platforms connecting long-term visions with mid- and short-term investments in a dynamic way.

The advantage of a partnership-based organisation of strategic research is that it allows coordinating a variety of fields and actors while creatively linking actors who would otherwise not establish collaborative ties. Coordination and connection are thus key aspects of well-functioning strategic partnerships – but only if the model builds on principles that afford strategic partnerships sufficient degrees of freedom in organising collaboration projects. Otherwise, the risk of reproducing fragmentation and the resulting problems known from FP7 cooperation will be substantial.

The CRF epitomises an interest among scientists to engage in shaping the framework conditions of research and innovation. Beyond the scope of specific recommendations, the CRF may serve as a source of inspiration for how to establish a direct dialogue between the scientific community and policymakers.

The CRF report was followed up by a 'CRF II' process during which the chairship of CRF put together a set of recommendations for the implementation of Horizon 2020 in light of the CRF report. The resulting paper (Højgaard, L. et al. [2012a]) focuses on recommendations for implementing measures to promote excellence, cross-disciplinarity, simplicity and impact. The recommendations for implementation along with the CRF report can be found at the CRF homepage (crf2012.org).

Sources and References

Højgaard, L. et al (2012): Visions for Horizon 2020 – from Copenhagen Research Forum.

Højgaard, L. et al (2012a): Copenhagen Research Forum II. Recommendations for an optimized implementation of Horizon 2020.

Both are available at www.crf2012.org.

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