



Space research in Horizon 2020

**Recommendations of the
FP7 Space Advisory Group (SAG)**

Executive Summary

Brussels

October 2012

Introduction

The FP7 Space Advisory Group has been requested to provide advice to the European Commission (EC) concerning the positioning and content of space-related research within the Horizon 2020 programme. The result is a document of more than eighty pages, containing a large number of individual recommendations. The advice given builds upon previous papers published in October 2010 and June 2011, putting forward evidence and a series of recommendations aimed at securing acceptance of the argument that “space must be a major and well-funded theme of Horizon 2020”.

This new document, summarised here, is structured to address four specific objectives derived from the Commission’s aims for the overall Horizon 2020 Programme. Thus, after chapters providing a general introduction, there are four chapters focusing on:

1. European competitiveness, non-dependence and innovation of the European space sector;
2. advances in space technologies;
3. exploitation of space data;
4. European research in support of international space partnerships.

Input from the “Space Hearing” organised by the European Commission in December 2010, aimed at giving Europe’s space research community an opportunity to submit topics which could drive the preparation of the Horizon 2020 Space Theme, was also taken into account.

General Advice

In general, it is recommended that Horizon 2020 contains two main pillars: “Space for exploring the Solar System and the Universe” and “Space for Grand Challenges on Earth” complemented by two further elements: “enabling technologies” and “crosscutting activities”.

The EC is called on to establish with the European Space Agency (ESA) and other main European space actors a research agenda for Horizon 2020 Space, identifying objectives, means and priorities and clarifying responsibilities.

European Competitiveness, non-Dependence and Innovation

Growth in the sector will be driven by the expanding development and uptake of downstream services and this should be the focus of Horizon 2020 in Space. To support this objective, Horizon 2020 should be adopted as a tool for the European Union (EU) to implement the responsibilities attributed to it in the European Space Policy. It should be the means of developing the use of satellite services to deliver European policy objectives. Schemes are recommended where ESA is made responsible for the upstream space segment and its

development while the EU supports preparation and exploitation, exploiting synergies with ESA to the full.

Development and maturing of technology to the point of acceptable application risk, plus ensuring, on the one hand, access to state of the art technologies in all key areas and, on the other hand, a level playing field with non-European competitors, are key factors underpinning competitiveness which need support. The current process for identifying critical technology issues and prioritizing development activities needs revision.

Analysis of user requirements should identify needs for both enabling technology development in the upstream sector and other technological enhancements to improve the competitiveness of space-based solutions. Some processes for identification of technology needs, their prioritisation and harmonization of European efforts already exist. The EC should build on such efforts with ESA, other European space organisations and industry. Horizon 2020 should contribute to the implementation of developments required by agreed roadmaps.

Current mechanisms in FP7 using open calls and co-funding need review. Open calls, which are adapted to give a chance to new ideas and sustain potential breakthroughs, should be continued, but this is not an appropriate tool for subsequent stages of developments needed to turn technologies into products,

The principle of co-funding is acceptable by industry as long as it can identify commercial perspectives for recurrent exploitation of the considered technologies. This should be a driver for Horizon 2020 and the level of support to industry should take into account the nature and the level of the investments needed for development and testing of high-tech products.

Advances in Space Technologies

The foundation for advanced technology research in Horizon 2020 should be a unified, harmonised Horizon 2020 Strategic Research and Innovation Agenda (SRIA) for space technologies, owned by the EU with content generated by ESA, Eurospace, SME's and other major stakeholders. SRIA should be fully integrated into the wider agendas of the research and user communities, in the European Technology Harmonization process and in other processes such as the European Space Components Coordination.

The strategy should address the short, medium and long term, bringing technologies from initial concept to flight proven status as appropriate. The current process for identifying critical technology issues and prioritizing development activities needs revision.

There is a clear connection between actions required to promote competitiveness and stimulating advances in space technology. Research must address the Grand Challenges, support existing road maps and be prioritised and focused in line with the budget available.

Exploitation of Space Data

Greater value can be derived from the exploitation of space data, both commercially and for tackling scientific, technical and societal challenges, if a concerted effort is made to ensure the coordination, quality assurance and standardisation of research data sets. This is best achieved at a European level under the umbrella of the EU/EC with a dedicated budget within Horizon 2020 set aside to support this work. This approach must be coordinated with ESA and other European stakeholders to accommodate planning and operation of new missions and optimal utilisation of current mission facilities and assets; in the space research area there is particular interest in astrophysics, robotic exploration of Mars and utilisation of the ISS.

In Earth observation, continuity of data sets and satellite coverage is critically important, as is establishing the metrological accuracy of the data. Attention to these issues is necessary to ensure that investment in future public and privately supported service development can be made with an appropriate level of confidence.

Regimes for obtaining data from missions, both scientific and operational, should be reviewed to ensure that barriers to exploitation are minimised and that Europe is internationally competitive in deriving value from space data, particularly in comparison to the US.

International Space Partnerships

There is a need for a consolidated, shared vision for robotic and human exploration of Mars, the Moon and Near Earth Objects, consistent with an international vision. A dialogue and gap analysis should help build a European consensus.

Europe, under the umbrella of concerted action of the EC and ESA, should initiate the formulation of coordinated international space research programmes in cooperation with major non-European space-faring nations, while retaining the European leadership in essential elements of those programmes. Cooperation should be continued or built with established partners, with China and India, as well as developing space nations. Space should be a tool of the EU for international cooperation in particular with emerging countries.

Strategies must be developed to mitigate increasing risks incurred by climate change, in particular through the development of long term forecast of life-threatening phenomena affecting international stability and security.

Concluding Statement

The Space Advisory Group, on the basis of the four objectives outlined above, recommends that most of the available Horizon 2020 space budget be spent on the preparation and implementation of activities associated with the development of technologies, applications and products, as well as of services to exploit space data. This should be in line with

European strategy and policy implementation and consistent with existing road maps for space technology. Following this advice would create maximum impact through the exploitation of space capability, both in science and exploration as well as for the well-being of all Europeans. It will help keep Europe at the forefront of space technology and provide inspiration as well as jobs for European citizens.