Open Innovation in the space sector for “Europe 2020”

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1. Barroso's "Europe 2020" and the Space Sector

"Europe 2020" A strategy for smart, sustainable and inclusive growth

•Where does Europe want to be in 2020?

- Smart growth – developing an economy base on knowledge and innovation
  - Flagship Initiative: "Innovation Union"
- Sustainable growth – promoting a more resource efficient, greener and more competitive economy
  - Flagship Initiative: "An industrial policy for the globalisation era"
- Inclusive growth – fostering a high-employment economy delivering economic, societal and territorial cohesion

On 5 March 2010, the Commissioner for Research, Innovation and Science, Máire Geoghegan-Quinn created the term "era of i-conomy" at the Innovation Summit of the Lisbon Council.

1. Barroso's "Europe 2020" and the Space Sector

Europe 2020: "smart, sustainable and inclusive growth"

"…promoting innovation and knowledge transfer throughout the Union…"

"…to develop a strategic research agenda…"

"…to launch "European Innovation Partnerships" between EU and national levels to speed up the deployment of the technologies needed to meet the challenges identified…

…will include … "the key enabling technologies to shape Europe's industrial future…""

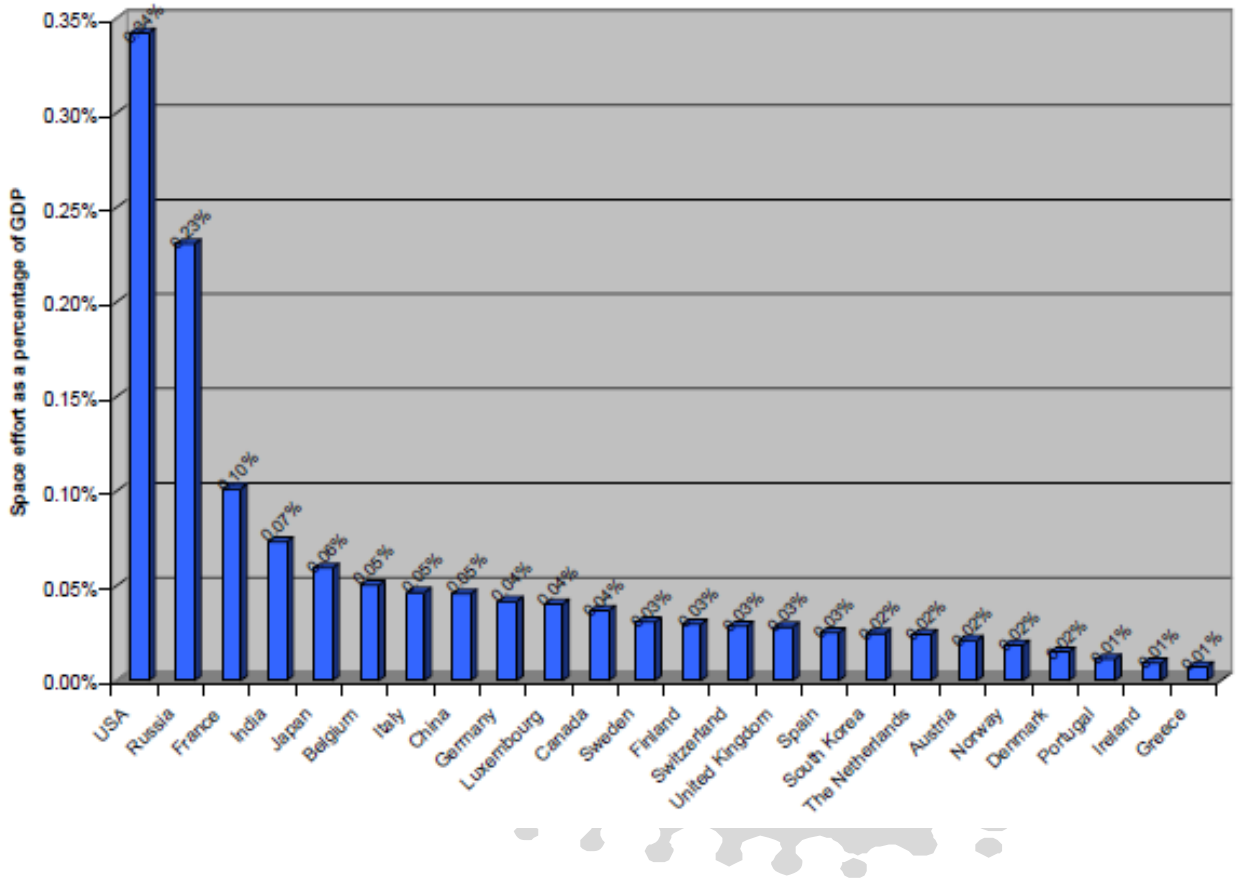
"…this will include promoting and comercialisation and take up of key enabling technologies…"

"…to develop an effective space policy to promote the tools to address some of the key global challenges and in particular to deliver Galileo and GMES …"

⇒**What does this mean for the Space Sector?**

- ⇒What is the relationship between science and technology to facilitate innovation?
- ⇒What is innovation in the space sector? What is its nature?
- ⇒How do other sectors deal with innovation?
- ⇒What can be learn from them?
- ⇒Can the space sector work together with them? How?
- ⇒What role and tasks for Member States (including legislative)?

2. Space Sector Overview



Source: Euroconsult data, IMF (2009)

2. Space Sector Overview

Some general figures in industry

•€6 billion sales. Increase since 2001 given the recovery of satcoms

•Institutional/Commercial share: Institutional programmes amount to 60% of sales while commercial programmes represent 40% of the sales

•Main institutional player is ESA with national programmes often only based on ESA programmes

•There is a high dependence on the commercial sector. Therefore, subject to market fluctuations. Fluctuations can only be balanced by institutional demand

•Sales to ESA represent €1,5 billion/year, sales to EU €0.7 billion/year

•Overall sales for the implementation of EU policies represent €3.2 billion

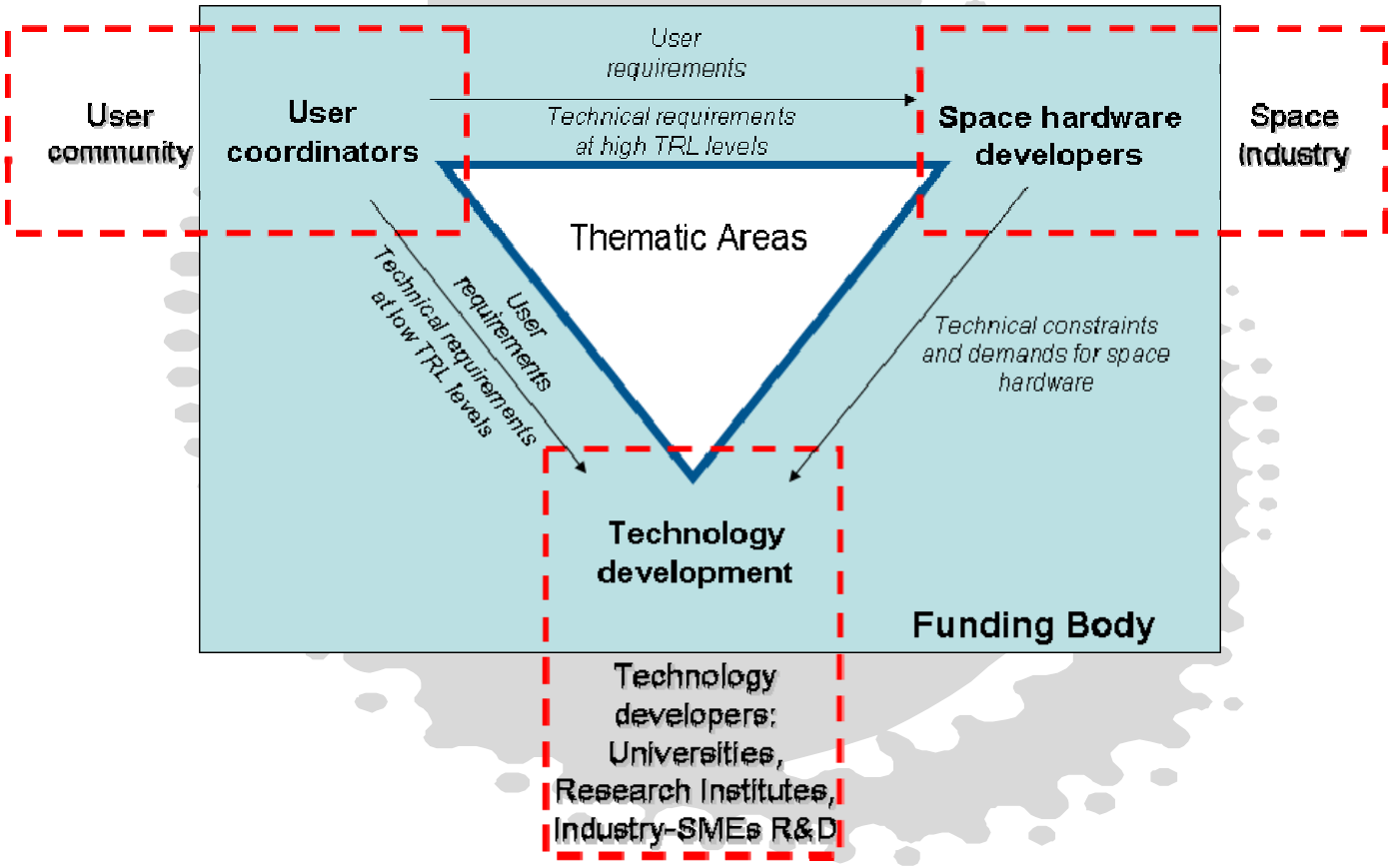
Manufacturing industry

•5 major manufacturers (EADS Astrium, Finmeccanica, ThalesAlenia Space, Safran, OHB) cover 70% of the market, SMEs represent less than 5% of employment, small space units 20%

Source: ESPI Space Policies, Issues and Trends 2009/2010

3. Actors Constellation Relevant for Space Innovation

Space Sector



4. Innovation in the Space Sector and Other Sectors

Aeronautics Sector

- Since the creation of the sector in 1890 with Otto von Lilienthal first successful glider, the first fifty years of aeronautics experienced tremendous and frequent innovations that changed our everyday life. The next fifty years of aeronautics it appears that no dramatic revolutions took place but rather the focus was in fine tuning existing technologies.
- Innovation expected by breakthroughs in other sectors and introduction in the aeronautics sector.

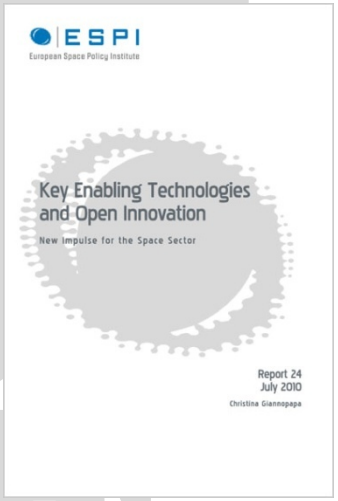
ICT Sector

- In the last 15 years the sector has been booming. A strong technology push has resulted in many new products and services. Not all new technologies have lived up to their potential. Some reasons relate to failure of traditional marketing tools to capture properly the “user needs” and deliver to the user the right message about the potential of the new technology.
- New marketing tools are needed that allow technology push to develop using better captured “potential user needs”. Continues monitoring of the potential user needs is essential.

4. Innovation in the Space Sector and other Sectors

"Innovation is the use of new, or existing, ideas, discoveries and inventions in the space sector, stemming from other sectors (spin in), and vice versa, the use of new, or existing, ideas, discoveries and inventions in other sectors, stemming from the space sector (spin out), to create economic and social benefits. Innovation also consists of scientific, technological, organisational, financial and commercial steps, which are intended to, or actually, lead to the implementation of innovations by space-non-space partnerships (spin together).”

Innovation is characterised by three stages:
a) incremental
b) breakthrough
c) utilisation

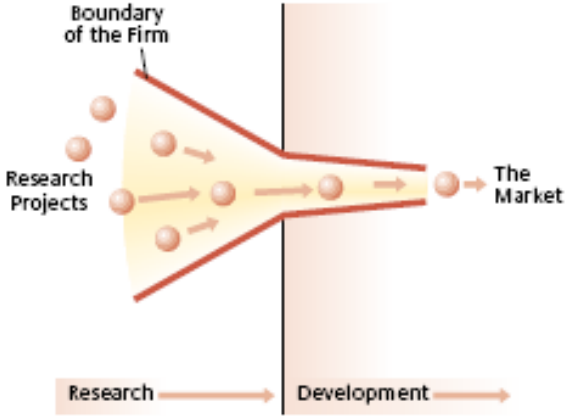


In collaboration with ESF "Forward Look on Technological Breakthroughs for Scientific Progress“

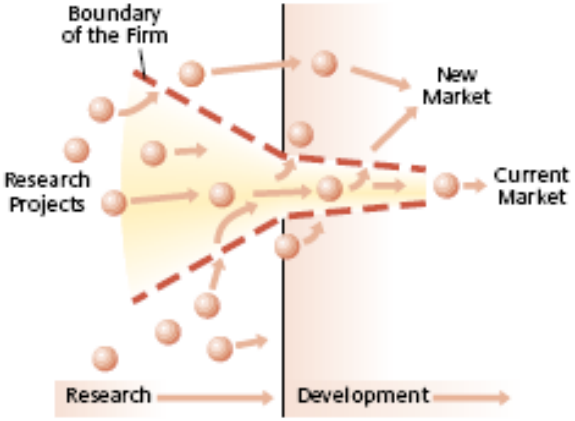
Source: ESPI Key Enabling Technologies and Open Innovation

5. Open Innovation in the Space Sector

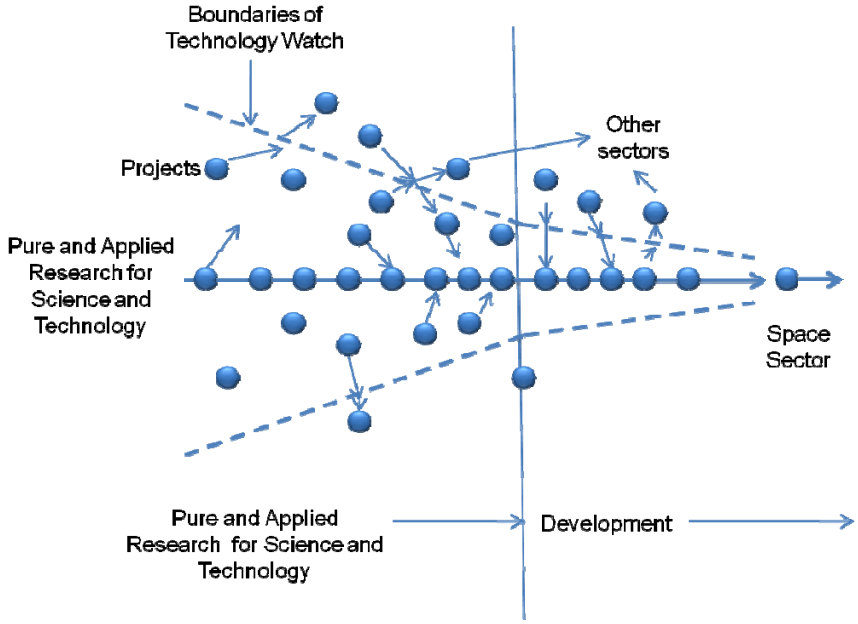
Closed Innovation (Chesbrough, 2003)



Open Innovation (Chesbrough, 2003)

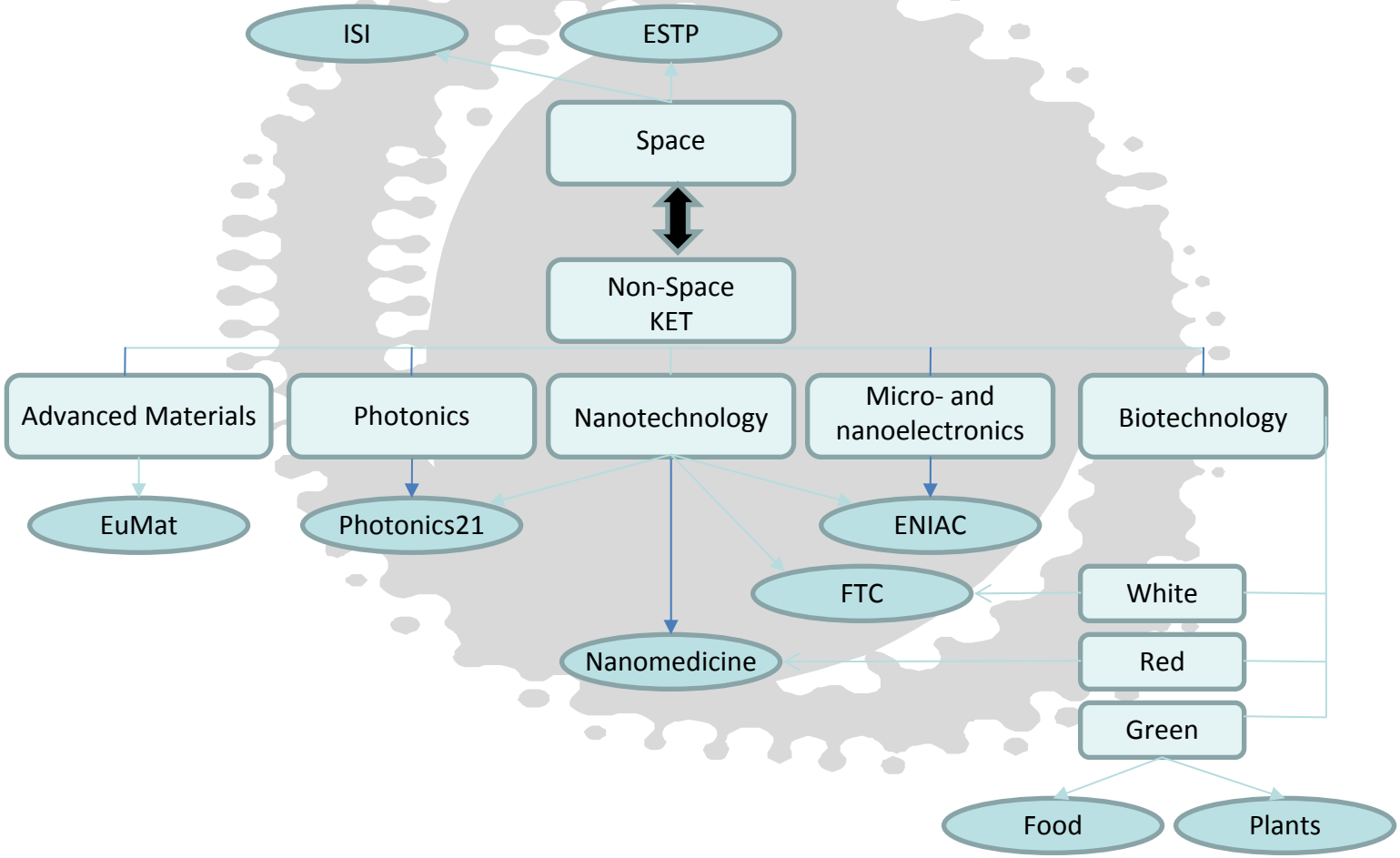


Open Innovation in the space sector R&D



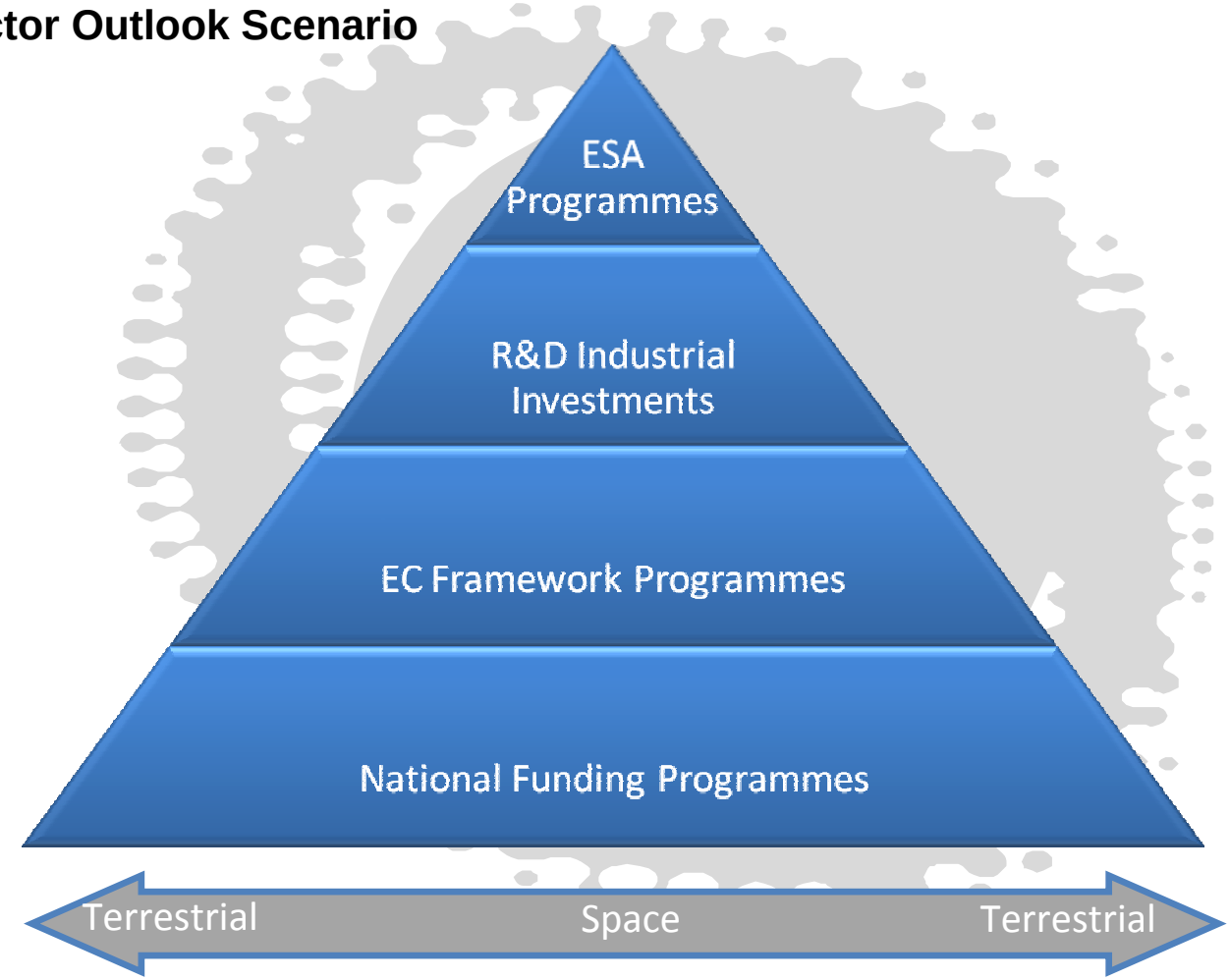
5. Open Innovation in the Space Sector

Technology Platforms and Key Enabling Technologies and Strategic Research Agendas



5. Open Innovation in the Space Sector

Space Sector Outlook Scenario



5. Recommendations to National and European Actors

Concepts

- Promote the transverse nature of space policy (e.g. environment, transport, security) and the benefits it can bring to the European citizen and in international cooperation.
- Promote open innovation for the space sector, in particular promote exchange of ideas and joint developments with non-space sectors.
- Promote “space innovation” focused on “spin in”, “spin out”, and “spin together”
- Identify the “space key enabling technologies” and their relation in the general “key enabling technologies” as a basis for cooperation with other sectors.
- Establish appropriate models for monitoring “potential user needs” where space sector can provide added value.
- Enhance the communication of space benefits to non-space audience.

5. Recommendations to National and European Actors

Cooperation

- Enhance cooperation in aligning strategic visions and funding mechanisms across Europe.
- Strengthen existing partnerships between ESA, EU and Member States.
- Facilitate the complementarily into a coherent European Space Programme.
- Strengthen ESA and the EC to continue working together under the Framework Programme under the space component and should further expand this cooperation in the non space areas and work towards a broad European Space Programme.
- Focus the alignment of programmes, strategies and roadmaps and use KETs as the "common language" for cooperation.
- Promote "innovative partnerships" between space and non-space actors.
- Promote Public-Private-Partnerships between space and non-space actors to co-finance R&D in KETs.
- Enhance coordination of space research which is mostly handled at national level and open up the ISS to all EU Member States.

5. Recommendations to National and European Actors

Mechanisms

- Establish adequate mechanisms for bringing together and aligning funding means, time scales as well as programmatic content, and by jointly defining roadmaps.
- Enhance links between space and non-space European Technologies Platforms as the first step in aligning strategic agendas with advancement, promotion and commercialisation of KET's.
- Institutionalise a space sector "Technology Watch" regarding new and disruptive technologies developing from other sectors. Space and non-space communities should be involved. KETs should be the main focus.
- Develop innovative mechanisms for capturing "potential user needs" of space and non-space users where space can bring added value.
- The space sector and ESA invest mostly in R&D needed for future missions. They need to strengthen investment and technology programmes in basic and applied research for generic and disruptive technologies which are not related today to a future mission.
- Promote adequate Intellectual Property Rights as they are essential for open innovation. The current ESA IPR system where IPR stays within the agency for space use only, does provide the basis for open innovation in technology development with non-space sectors partners.

5. Recommendations to National and European Actors

Mechanisms

- ESA should develop adequate mechanisms to participate in non-space FP projects as an active researcher utilising its laboratories in order to gain technical know-how from other sectors regarding KET's.
- ESA and EC co-financing under Framework Programme non-space scenarios:
  1) Use ESA existing technology programmes in combination with FP for KETs. This already partially exists but it is mostly uncoordinated. There is a need to develop coherent coordination mechanisms.
  2) Develop new funding programmes. A new science and technology programme can be envisaged to be jointly created together with ESA and other funding bodies like DG Research.

⇒ Numerous areas, where direct involvement of National Parliaments through providing funding, shaping programmes and setting regulatory frameworks is required.

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