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**- Space and Innovation -
Opportunities for the EU**

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1. Introduction

Today's society depends on space activities. Space technologies are now omnipresent in every sphere of economic, social and cultural life. Space is no longer the exclusive preserve of experts. Most obvious are weather forecasts, satellite communications, TV and security aspects. Few citizens realize how dependent their lives are on space assets. Space technology brings new business opportunities; space technology transferred to terrestrial applications finds its way into new products and applications.

Space is a tool to serve the interests of the Union¹, its Member States and its citizens: geopolitical strategic influence, scientific progress, economic growth in the knowledge economy and security. Space is an asset of European integration, not only through its technical capacities but also through the global adventure and challenge it represents for Europe. Space policy was included as a shared competence between the European Union and its Member States in the draft European Constitutional Treaty.

Article I-13 of the EU Constitution: *In the areas of research, technological development and space, the Union shall have competence to carry out actions, in particular to define and implement programmes; however, the exercise of that competence may not result in Member States being prevented from exercising theirs.*

The definition of space as a shared competence essentially gives the Union the authority to implement space programmes, as long as it does not interfere with Member States' activities.

Later in the document, under Section 9, RTD and space are dealt with at greater length. Article III-150 states:

To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European space

¹ http://ec.europa.eu/comm/space/index_en.html

policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space

To contribute to attaining the objectives referred to [above], a European law or framework law shall establish the necessary measures, which may take the form of a European space programme.

2. EU Space Policy

(1) Independent access to space; (2) space applications for the benefits of its citizens and governments and (3) space science have been traditional reasons to be engaged in space activities. There are mainly three domains for space applications: telecommunications, navigation and observation. Europe has made major investments into space, without which Europe would be lacking many basic infrastructures (e.g. satellites).

In November 2004 – after a consultation process with a White Paper on European Space Policy² - the first ever European “Space Council” was held in Brussels, bringing together ministers from 27 EU and/or ESA Member States. By defining space as a shared competence of the European Union, the Space Council acknowledged the importance of space activities.

Whereas DG Enterprise of the European Commission is in charge of defining an overall European space policy, it is the European Space Agency (ESA) which is Europe’s gateway to space. Its mission is to shape the development of Europe’s space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe. ESA serves civilian purposes. ESA is an entirely independent intergovernmental organization (with 17 member states and a budget of 3 billion €), but functions within an ESA/EC Framework Agreement.

Nowadays, the EU-Space Policy is aimed at being independently present in space, generating benefits for its citizens. The two flagships of the EU space policy are: global navigation (Galileo) and Earth observation (GMES). The EU focuses mainly on commercial and strategic programs:

- Research and development, linked with satellites
- Development and demonstration of space technology applications, namely on communication, navigation and earth observation.

Gradually, the space related R&D programs have gained their share in the EU Framework Programs for Research & Development. In the current Framework Program (2002-2006), “aviation and space” is one of the seven thematic priorities, with a budget of 1075 million euro, with 75% destined for aviation and 25% (235 million euro) for space programs. The working program “space” is threefold and focused on Galileo, GMES and telecommunication satellites. The proposal for the 7th Framework Program on R&D (2007-2013) keeps space as a thematic priority, with an indicative budget of 3960 million euro for the complete period.

² http://ec.europa.eu/enterprise/space/whitepaper/index_en.html

The Galileo³ Program is a joint initiative from the European Commission and ESA to build up an independent capacity on European satellite navigation systems. Independent as in “not military controlled” as its counterparts GPS (USA) and Glonass (Russia).

GMES⁴ is also a joint initiative from EC and ESA and stands fully for Global Monitoring for Environment and Security. The main aim of the GMES program is to unite all data concerning environment and security. It can serve for multiple reasons, such as early detection of desert forming, monitoring of harvesting, observation of conflicts and streams of refugees, etc...

Third pillar for EU Space Policy is the satellite communication, with a budget of 35 million euro. There are great expectations that European satellite communication systems will find its way to millions of consumers for a range of applications, as well as mobile (3G and UMTS) as resident telephony and audiovisual broadcasting.

The public expenditures for space activities in Europe are estimated on 5380 million euro (2004), coming from five sources:

- ESA – 2700 million euro
- The member states - 1600 million euro for national civil and 550 for national military activities
- Eumetsat – 300 million euro
- EU – 230 million euro, via R&D programs

(compared to the NASA budget in 2004: \$ 4 billion)

YEPP statements on EU Space Policy

- YEPP calls upon the EU and upon the ESA to keep focusing on the more applied, civil aspects of space, i.e. those that hold the maximum benefit for citizens. The objective of a European space strategy is to guarantee an independent access to space. New human spaceflight programs are only of secondary nature. The establishment of a full European space capacity, including its own launching capacity, is only possible with a determined political long-term commitment and solidarity of all European States (ESA= 17 / EU= 25 à 27).
- Space can't be seen as a strictly commercial and industrial sector. As European Space Policy should include the security and environment dimension, the institutional aspect of space is fundamental.
- The development of space technologies necessary to future space systems requires increased both governmental and private investment in R&D.
- Space is – unlike some other areas of science – appealing enough to attract a lot of interest from young people. Therefore, it is crucial to explore this interest beyond the voluntary and stimulate youngsters to choose for research-related educational and career paths.

³ http://ec.europa.eu/enterprise/space/programmes/galileo_en.html

⁴ <http://www.gmes.info>

- Support for Space Program can offer Europe a great contribution in the field of sustainable development. This can be achieved by knowledge gathering about evolutions concerning climate change, nature and biodiversity, natural resources and waste, on the European continent as well as globally.

3. Space and Industry

Space - and especially the satellite communications (satcom) as space application - has become a multi-billion euro industry, one which affects our daily lives (modern telephone, media services and the internet). By this, satcom is a strategic industrial sector for growth and employment, and thus part of the Growth and Employment strategy (Lisbon Strategy). Space applications underpin economic activity and crucial government services, taking their significance beyond the research aspect.

Europe is a leading global player in the commercial satellite market; an important part of the revenue of European space industry stems from the manufacture and launch of communication satellites. Ariane-4 has launched 139 telecom satellites and Ariane-5 more than 26.

Europe has a sound technology base; and scientific excellence has been established. All this has been achieved with public expenditure in space representing six times less than that of the US. If Europe is willing to keep its status as only serious competitor in this sector to the US, the European space sector needs to maintain excellence at an affordable cost. Increasing the budget for innovation activities of industrial spatial technology producing enterprises might be necessary, if launching more satellites and bringing European citizens into space deems to be necessary. All member states must contribute in a proportional way.

In order to position itself strategically in the satcom market and to shake off its dependence on military systems, the EU has launched its Galileo system. Galileo will offer everybody satellite positioning services with guaranteed reliability (real time and down to one meter accuracy). Market users, as well as commercial and public services, will benefit from the Galileo possibilities (road, rail and air transport, mobile telephony, help by humanitarian operations, conduct of research, ...). The Galileo configuration will consist of 30 satellites and will be fully operational by 2010.

Space systems are developed using state-of-the-art design and testing processes to enable them to be used in the most inhospitable environment know to man. The development of technology for use in space has led to numerous technical breakthroughs. It is no wonder then that when this space technology is applied in terrestrial technology, key advances can be made. Therefore, the utilization of space borne knowledge and technology in terrestrial products and services is of great interest to increase competitiveness of companies in the European Union.

YEPP statements on Space and Industry

- YEPP believes that the EU has as a key role to play in the industrial sector's innovation dynamic by the support for R&D, by public procurement approaches, by early market adoption practices and by efforts to lower trade barriers together with the development of human capital in the unified European educational and research area. The European Union must definitely contribute to further progress in securing its position as a leading knowledge based society (cfr. Lisbon Strategy).
- That under the present circumstances, it is essential to create a competitive knowledge society, with the aim of ensuring that all European citizens, notably those with special requirements, will be able to have access to advanced technologies and services
- Space has always been working on the edge of innovative thinking and creating. Therefore, YEPP is convinced that basic space science is an activity of great importance, which often turns out to be the engine of development of new technologies leading to new applications, products and services.
- YEPP calls for a EU-backed Technology Platform in the 7th Framework Program for Research & Development (FP7 / 2007-2013), bringing together all stakeholders from industry, enterprise, civil society and the policy-making sphere to forge a common and strategic space research agenda. From this prospective, the EU functions as convicted catalyst to build cross-sector strategic alliances to enable the innovative strengths of the space industry to support market-driven growth in other sectors.

4. Space and Environment

Monitoring of the earth's environment from out of space is one of the most promising developments where EU and ESA has taken a high rise following the realization of the GMES project . GMES aims to monitor the state of the environment and its short, medium and long term evolution to support policy decisions. The applications of GMES fall under three main categories: mapping (road maps and topography, land use patterns, etc.), support (emergency responses to natural and man-made disasters, including refugees from conflicts) and forecasting (not only weather, but air pollution levels in cities and the quality of marine waters).

YEPP's statements on Space and Environment

- YEPP calls upon the EU and upon the ESA to confirm that GMES is and will be the most important space application program of the coming years, as this forms a strong and reliable backbone for a variety of security-related services for public use. In the framework of sustainable development and climate change, GMES is more than a useful instrument. In this order, YEPP welcomes the decision that 4/5th of the FP7 allocated for space and security will be destined to the GMES program.

- YEPP foresees possible mergers between EU-space policies and EU environmental and EU development policies. The crossovers whereby the EU obtains the most accurate data for environmental threats and worrying natural disasters like Katrina and the tsunami. EU can help the developing countries in the South and East to better combat environmental threats and thus help eradicate hunger and poverty on the one hand and on the other hand create the necessary infrastructural preconditions for sustainable development.

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