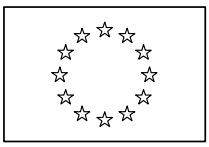

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Annexes to the

**Communication from the Commission
to the Council and the European Parliament**

"European Space Policy - Preliminary Elements"

{COM(2005)208 final}

ANNEX A

Framework for building up a European Space Policy
Implemented by a European Space Programme

1. Structure

Policy level

Definition of the overall European Space Policy in consultation with all stakeholders

Programmatic level

EU, Member States and ESA implement the European Space Policy through the European Space Programme

EU-led activities :

Space exploitation: applications
-Flagships:
- Galileo (TEN + FP7)
- GMES (FP7)

-Communication Systems

EU contribution via FP7 to ESA-led activities:

- Space exploration
- Space science (ISS)
- R&D for access to space

ESA-led activities:

- Exploration
- Access to space
- Science
- Space technologies

ESA contribution to EU-led and other-led activities:

- Preparatory activities for space exploitation: applications

Nationally- and other-led activities

Member States support to EU and ESA activities

EU Framework for building up a European Space Policy

2. EU Priorities

EU-led activities	**Instruments**
Space exploitation: applications	
Flagship: Galileo	TEN + FP7 TP Transport and ICT
Flagship: GMES	FP7 TP Security and Space (+TP ENV, ICT and Transport)
Communication systems (integration with mobile and terrestrial systems)	FP7 TP ICT + Security and Space
EU contribution	
Space exploration	FP7 TP Security and Space
Science in space (e.g. ISS utilisation)	FP7 TP Security and Space
R&D for access to space	FP7 TP Security and Space

3. Possible other EU contributions

	Instruments
Space research infrastructures: microgravity, EO databases, astronomical observatories	FP7 SP Capacities
GEOSS	FP7 TP ENV
Accompanying measures: education, international cooperation	FP7 SP People and Capacities
Critical technologies, Technology Transfer and specific **SMEs** measures, data archiving and dissemination	Competitiveness and Innovation Programme (CIP)

FP7 = 7th Framework Programme **SP = Specific Programme** **TP= Thematic Priority**
ENV= Environment incl. Climate Change **ICT= Information and Communications Technologies**

ESA Framework for building up a European Space Policy

4 ESA Priorities

ESA-led activities

- Access to space
- Exploration and ISS
- Space Science
- Earth sciences
- Technology (incl.telecoms technology)

ESA contribution to EC and other-led

- Navigation (Galileo, EGNOS, future navigation)
- GMES
- Satellite communications
- Meteorology

ANNEX B

PRIORITY PROGRAMME ELEMENTS

I. EU

I.1. Galileo

Studies on Galileo emphasise its strategic importance and high cost/benefit ratio compared with other infrastructure projects in Europe. Integrated with other space-based or terrestrial technologies, radio-navigation services are expected spread rapidly. Benefits for the European economy will come for aerospace, from the sales of receivers offering interoperable services and the development of downstream innovative value-added services in different market sectors: hence the creation of new jobs.

The Galileo concessionaire process has led to substantial equity funding commitments. Overall deployment cost is 2.1 BEUR followed by an annual cost of 200 MEUR for operations. 1 BEUR has already been proposed as the Community contribution[1] in the 2007-2013 Financial Perspectives. The private sector has committed to cover two thirds of the deployment costs. Income is expected to be generated from the sale of services and IPR.

The Galileo Joint Undertaking ensures the management of the programme during the development phase including selection of the concessionaire. Management of the Community contribution will be the responsibility of the European GNSS Supervisory Authority[2]. The Galileo definition phase and the development of location-based services have been supported by FP5 under the "Sustainable Transport" and "Information Society technologies" priorities In FP6, an additional 100 MEUR has been earmarked to support the development of the system and services.

Many third countries are keen on participating in Galileo. Three cooperation agreements are already signed and discussions have been initiated with nine more. In addition, Switzerland, Norway and Canada are examining possible financial participation in subsequent phases of the programme.

I.2. GMES

The primary objective of GMES is to provide, on a sustained basis, timely information related to environmental and security issues in support of public policy makers' needs. The GMES initiative will generate Geographical Information Systems for operational services. GMES shall ensure that Europe will have continuous and independent access to space and in-situ data enabling to deliver its operational services. Earth observation systems are already used to pursue EU policy objectives. Continuity is essential: the services provided need to be maintained and extended. Whilst in the long term, services should be funded by the beneficiaries, the basic infrastructure and enabling technologies will need upfront investment; the link between policy needs for information and (Community) investment in supporting infrastructure has to be made.

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1 This budget will be the Community contribution for the next phases of the programme, i.e. deployment and operations

2 Council Regulation n°1321/2004

Development and research activities required for the establishment of GMES Services are conducted as projects under the 6th Framework Programme of Community R&D (FP6) or under ESA's element of the programme. A concept of "*Initial Services*" is proposed as the next step: using criteria such as (i) maturity and availability to users, (ii) reliability/usefulness, and (iii) long-term sustainability, a limited number of fast track GMES Initial Services will be identified. These will contribute to programmes required for subsequent operational applications.

GMES will receive R&D financing through FP7. Partnering with other sources of financing could be fostered by a JETI (Joint European Technology Initiative[3]), allowing multi-source funding based on clear user demand. In cases where services become integral to development and implementation of policies in fields such as environment, they might be paid for by the relevant authorities. In some areas, GMES may also attract private sector customers, with cost-recovery mechanisms involving the users of GMES services.

GMES contributes to the Lisbon Strategy, hence its inclusion by the Commission in the "Initiative for Growth" and the "Quick-start" list. It is a mature concept for European infrastructure, closely linked with Community policies and having significant commercial potential, capable of being delivered through a public-private partnership. It would give Europe leadership in an area of management and use of major space infrastructures.

I.3. GEO

The "Group on Earth Observations" (GEO) initiative is an international research oriented activity aiming to implement a "Global Earth Observation System of Systems" (GEOSS) within the next 10 years: GEOSS will link the various existing earth observation systems around the world, ground-based, airborne and space-based observations of the Environment. It is focussed on those phenomena which have a direct relation with the state of the Environment and the Climate.

GEOSS will be implemented by the GEO Members, currently more than 50 countries of the world and the European Community (represented by the Commission), which are both potentially users and producers of data and tools, assisted by more than 40 International Organisations. GMES observation systems will be the main European contribution to the GEOSS "system of systems", whilst GEOSS will aid further improvement of GMES services by providing information from interoperable Earth observation systems. The GEOSS initiative will relate the GMES system with the international level.

The financing of the GEOSS research activities is provided by the GEO Members on a voluntary basis. Despite the "legally non-binding" character of the initiative, the European Community will contribute to the implementation of the 10-Year GEOSS Implementation Plan through the funding of research projects supported by the FP6 in 2005-2006 and later by the 7th Framework Programme under the "Environment (including climate change) priority". A financial contribution (up to 50% of the operational cost) will be also ensured to the GEO secretariat, which will be hosted by the World Meteorological Organisation (WMO) in Geneva; European GEO Members can contribute to the GEO secretariat on a voluntary basis.

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[3] In FP 7 Joint European Technology Initiatives (JETIs) are foreseen for initiatives that cannot be achieved by using the existing FP7 instruments, due to the ambition of their research agenda, their complexity and scale, and to the need for a specific management of financial and human resources. JETIs are foreseen to be implemented through Article 171 of the Treaty, which refers to the setting up of Joint Undertakings for the execution of Community research, technological development and demonstration programmes

I.4 Communications systems

EU-led activities should focus on applications and services based on federated public and institutional requirements and needs and specifically on the terrestrial and terrestrial-related ground segment networking elements. These EU-led activities should complement ESA-led activities with focus on space and satellite segments.

The important role of satellite communication has recently been recalled in the context of the 'Kok Report' that stressed the potential contribution of wireless networks to bridge the digital divide. The role of ICT technologies in reaching the Growth and Employment objectives and DG INFSO's i2010 initiative as next step in the eEurope evolution in terms of broadband coverage and take-up are also important elements.

An integrated approach is proposed in the context of exploring a joint initiative as part of the EC/ESA Framework Agreement. This is in-line with the position of the industry that has also been proposing a more systematic and synergistic approach between ESA-led actions and EU-initiated actions in the field of satellite communication.

A proposed integrated approach should take a longer term, research intensive perspective, which does not risk distorting competition in the internal market. It should be associated with a significant number of clearly identified technological challenges. Research activities on innovative satellite communication could cover: advanced mobile systems for governmental use, e.g. providing enhanced coverage for civil protection and public security systems; advanced satellite communication infrastructures; broadband satellite systems, with capability to provide wide-coverage broadband access, contributing to bridge the digital divide; interactive and high-definition TV as a major consumer of bandwidth; and advanced mobile systems in commercial areas, e.g. with capability to provide multicast overlay networks on top of 3G or B3G terrestrial services.

II. ESA

II.1 Exploration

Space exploration is an inspiring and emblematic activity. It responds to the desire of humankind to answer compelling questions on the origins and the future of life. Robotic exploration missions such as Mars Express and Huygens are highly visible illustrations of technological achievement and scientific breakthrough. Human space exploration will be an international endeavour that will stimulate innovation and technology development and further inspire youth and the general public.

The International Space Station (ISS) is the human outpost in space and an essential step towards space exploration. Europe has gained a reputation as a highly reliable partner in the ISS and contributed significantly through the expertise of its industry and scientific community. The ISS can be viewed also as a part of the European research infrastructure, where potentially all Member States in the 'Space Council' could be involved.

II.2 Access to space

An autonomous and competitive space launch capability is a pre-requisite for a successful exploration and exploitation of space and for guaranteeing Europe's strategic independence in the space sector. The current Ariane-5 launcher provides a guaranteed access to space for Europe. However, the limited European institutional market makes the European industry critically dependent upon commercial market conditions.

ESA is extending the range of available capabilities in Europe through a family of launchers, including Ariane-5 upgrades, developments of new launchers (Vega), and the exploitation of Soyuz, under relevant agreements between ESA, France and Russia. Public European customers should use these European capabilities under preferential conditions.

Additional coherence and synergy must be provided with related non-space areas, including aeronautics and defence.

II.3 Science

Space Science

Space science is high profile (e.g. Mars Express, Smart-1 and Huygens), and has been the mainstay of publicly funded European space. ESA ensures coordination with national activities and technical cooperation with the USA and other potential partners.

The programme has a long term (15-20 yr) plan, 'Cosmic Vision', whose content is largely determined by the science community. Cost efficiency and constrained resources require the plan to shift focus between solar system and astronomical activities over time. During the period 2007-2013 the emphasis in Cosmic Vision is on understanding conditions beyond our solar system, searching for planets, looking for conditions of life, understanding the galaxy we inhabit, watching planet, star and galaxy formation, analyzing the detritus of the Big Bang.

Earth sciences

The programme framework is the Living Planet programme, pursued through the Earth Observation Envelope Programme (EOEP). It also contains technology preparation, development of data products and applications, the operations of all ESA Earth science satellites and a multi-mission Geographical Information System. It provides the scientific foundation of future environmental services and for services related to disaster forecasting, mitigation and management. ESA's role in such activities is crucial in maintaining the level of scientific Earth observation missions.

Scientific missions funded under EOEP address pertinent questions: climate change, water resources management, atmospheric trace gas compositions, etc. These science missions are leading to operational EO-based applications, the principal goal of GMES.

Coordination with national activities is crucial, as combined efforts are required to sustain the level of Earth science activities at European level. National activities include national science missions or instruments flown on ESA or other agencies' satellites, in addition to providing a reservoir of scientific expertise. National space investments tend to focus increasingly on operational aspects.

Exploitation of ISS - Life and Physical Sciences

ESA's Programmatic reference is the ELIPS programme (2002-2015). A key priority for Europe will be to use the ISS effectively to maximise the return on investment. Already today Europe is the main scientific user of the ISS. Priorities for future scientific and applied research have been identified by the European Science Foundation and are backed by high-level research groups in academia and industry.

ESA issues Announcements of Opportunity to laboratories, universities, research centres, Member State industry. The selected experiments form the scientific programme based on merit, fully coordinated with Member States.

II.4 Space Technologies

Space technology developments pursue four aims:

- Ensure the competitiveness of space-based applications (viz alternative solutions, and worldwide)
- Prepare the technologies required for next-generation systems;
- Support innovation and demonstrate new space-based applications (in particular in satellite telecommunications and Earth observation);
- Ensure the availability of European sources for critical technologies.

Development of space technologies is today spread between ESA, national and industrial programmes. Efforts for harmonisation are on-going.

III. MEMBER STATES – text to be added in the full programme proposal on basis of Member States' input