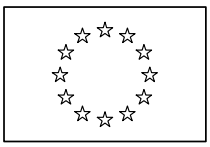

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European Space Programme - Preliminary elements

Accompanying document to the

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

European Space Policy

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1. INTRODUCTION: RATIONALE OF THE EUROPEAN SPACE PROGRAMME

The **European Space Programme** constitutes a **common, inclusive and flexible programmatic base**, on which Europe performs its space activities by utilising the available resources most efficiently at all levels. The Programme shall be in compliance with the objectives and guidelines set out in **the European Space Policy** and provide programmatic objectives per space domain in support of its implementation. It will allow major actors involved to monitor progress achieved and support their efforts towards **increasing transparency, reducing unnecessary duplication and enhancing complementarity** among all space-related programmes. It will thereby help to achieve in due course a **coordinated joint European space effort, responding to European and national user needs and requirements.**

The European actors taking part in the Programme are

- **The European Space Agency (ESA)**: Key instruments for delivery will be the Agency's mandatory and optional programmes within an ESA long-term strategy taking into account other intergovernmental, EU and national capacities and activities so as to effectively organise synergies and integrated approaches between them.

- **The European Union (EU):** Key instruments for delivery will be in particular the 7th Framework Programme for Research and Technological Development (FP7) and the Trans-European Network programmes and resources coming from non R&D sources.

- **Member States:** Initiated and executed at Member State level in line with national rules and funding instruments, national space programmes are responding to national needs while also aiming at supporting wider objectives pursued by the European Space Policy. Bi- and multilateral activities also contribute.

- **Other intergovernmental organisations operating at European level**, in particular agencies operating and exploiting European space assets such as the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).

Activities performed in **European industry and by operators and service providers** need to be duly taken into account and close cooperation ensured on technology R&D as well as mission development and operations. Public-private partnership (PPP) schemes for applications and service provision need to be further developed.

The preliminary elements of the European Space Programme in the fields of **Applications** and **Foundations** represent a non-binding collection of activities that are currently on-going and envisaged for the short to medium term. They correspond to inputs provided by the respective stakeholders, and aiming to increase transparency of existing space activities in Europe. In the applications field, particular focus is given to joint European programmes such as GMES and GALILEO.

The activities decided prior to the establishment of the European Space Policy are grouped by objectives derived from the European Space Policy - an exercise that will gain in coherence as the Programme is successively updated. Further activities at a lower level of detail such as the

development of specific payloads, instruments or experiments, are not brought out in this document, yet actively contribute to the overall European space effort.

The Programme's content and the methodology of its use will be **reviewed and updated** regularly in close coordination with users and all stakeholders to reflect or adapt it to overall policy objectives. **Future activities shall be included gradually so as to build a coordinated and common strategic framework**, displaying the complementarity of space activities across Europe. After further discussion within the High-Level Space Policy Group on the future scope and specific design of the European Space Programme, a first revision of the document will be prepared during 2007 and 2008 by the ESA/EC Joint Secretariat. The revision will take account of the preparation of ESA's Ministerial Council and the further evolution of EC programmes and national plans. A revised European Space Programme will be presented to the Fifth meeting of the Space Council to endorse it through its formal adoption by the Competitive Council and by the ESA Council at Ministerial level.

Member States are therefore invited to inform the Joint ESA/EC Secretariat on planned new programmes as well as on updates to existing programmes; the information should show how such programmes fit with applicable ESP objectives and guidelines.

Indicative budget information for the time period 2007-2013 is provided for major European-level activities. Similar detailed national budget information by space domain needs to be collected during the revision phase of the European Space Programme. The current document provides an indication on the overall weight of national programmes within the overall European space effort by indicating their share in percentage, taking 2006 as a reference year. The inclusion of an activity in the European Space Programme framework does not imply any exchange of funds or transfer of responsibility amongst the stakeholders.

2. DRAFT PROGRAMMATIC OBJECTIVES

In support of overall policy objectives outlined in the Strategic mission statement of the European Space Policy, the European Space Programmes identifies programmatic objectives by space domain based on provisions within the European Space Policy document, the ESA Long-Term Plan 2007-2016 and the 7th Framework Programmes for Research and Technological Development (FP7). Implementation should build on ongoing and short to medium term activities as outlined in chapter 3.

Overall Space Policy Objectives	Draft Programme Objectives
APPLICATIONS To take account of the evolution of user needs, integrated space systems shall be developed and the integration of space and terrestrial systems shall be promoted, to provide effective and cost-efficient services.	
SATELLITE NAVIGATION	
– Foster innovation, competitiveness and economic growth. – Meet Europe's security needs. – Secure unrestricted access to new and critical technologies, systems and capabilities.	**Secure European independence regarding state-of-the-art satellite navigation technology and develop services offered by navigation systems increasing the quality, quantity and variety of data offered and contributing to the competitiveness of the European industry**, by: • Proceeding with the full-fledged development of the GNSS infrastructure • Preparing future GNSS infrastructures and launching the technology demonstration of a 2nd generation PNT System • Promoting the use of PNT systems within integrated applications • Ensuring implementation of international partnerships on GNSS
EARTH OBSERVATION	
– Foster innovation, competitiveness and economic growth. – Meet Europe's security needs. – Secure unrestricted access to new and critical technologies, systems and capabilities. – Serve Europe's public interest in sustainable policy making in the field of Environment and Climate Change	**Develop a full-fledged European Earth Observation Infrastructure and associated operational services for Environment and Security, taking into account dual-use assets**, by: • Proceeding with **GMES** space component development based on national and ESA developed assets. • Reinforcing the dialogue with user communities and fostering the development and validation of new services and applications, exploring data policies, mechanisms for data provision and management (space and in-situ), focusing in the first place on a set of **GMES** fast-track services by 2008. • Reinforcing the dialogue within appropriate international bodies; identifying the role of GMES within GEOSS • Ensuring continuity of European capacities in operational meteorology
SATELLITE COMMUNICATIONS	
– Foster innovation, competitiveness and economic growth and be the market leader in commercial space. – Meet Europe's security needs. – Secure unrestricted access to new and critical technologies, systems and capabilities.	**Contribute to the competitiveness of the European space industry and to the development of the information society in Europe,** by: • Developing advanced satellite communication technologies in cooperation with industry and operators leading to new demonstration missions, taking due account of dual-use requirements • Increasing integration with terrestrial systems in support of European and global communication infrastructures and linking to other application domains • Developing end-user services offered by satellite communications increasing the quality, quantity and variety of data, and developing multimedia satellite systems (merging mobile, broadband and broadcast).
SECURITY AND DEFENCE Future national and European-level developments.	
– Meet Europe's security and defence needs. – Secure unrestricted access to new and critical technologies, systems and capabilities.	Future national and European developments

FOUNDATIONS	
SCIENCE and TECHNOLOGY	
– Foster innovation, competitiveness and economic growth – Enhance the contribution of space research to the knowledge-based society – Meet Europe's security needs – Secure unrestricted access to new and critical technologies, systems and capabilities – Serve Europe's public interest in sustainable policy making in the field of Environment and Climate Change	**SPACE SCIENCE** **In the context of the Lisbon Agenda and ESA's actions in support of competitiveness and discovery, develop global scientific leadership and expand the knowledge base**, by: • focusing on specific priority issues: Life and Planetary formation, Solar System, Fundamental laws of the Universe, Origins and evolution of the Universe • Supporting synergies of space science activities with other science activities and technology feed-off to applications • Increasing international cooperation activities **EARTH SCIENCE** **Extend Earth Science activities aimed in support of global change assessment and environmental policies,** by: • Developing new missions in support of core topics: Ocean/Hydrosphere, Air/Atmosphere, Ice/Cryosphere, Land Surface/Biosphere, Solid Earth/Geosphere • Ensuring effective exploitation of science data in conjunction with EO applications within GMES • Increasing international cooperation activities **TECHNOLOGY** **Contribute to innovation and competitiveness,** by: • Maximising synergies between civil and defence, space and non-space technology developments • Identifying critical technologies and perform associated technology demonstration missions • Harmonising technology developments
INTERNATIONAL SPACE STATION AND EXPLORATION OF THE SOLAR SYSTEM	
– Enhance the contribution of space research to the knowledge-based society – Secure unrestricted access to new and critical technologies, systems and capabilities	**Reap the scientific and technological benefits of investments made in the ISS project and prepare future exploration activities to become a key player within the international exploration architecture**, by: • Ensuring maximum scientific return especially in Life and Physical Sciences on investment and optimum utilisation of the ISS • Strengthening life and physical sciences activities in support of non-space applications and exploration-related activities. • Preparing and demonstrating core capabilities (enabling technologies and infrastructures) for next step in exploration, notably robotic Mars exploration and possible activities linked to Lunar Exploration. Cooperation with international partners on human space transportation according to scenarios to be decided by Member States.
ACCESS TO SPACE	
– Secure unrestricted access to new and critical technologies, systems and capabilities. – Foster innovation, competitiveness and economic growth	**Maintain independent access to space**, by: • Maintaining Europe's space port (Guiana Space Centre)under operational conditions • Consolidating the European family of launchers: Ariane 5, Vega, Soyuz at CSG • Preparing and safeguarding technological and industrial capabilities for the development of next generation launchers • Exploring possible long-term options for cooperation with strategic partners

3. EUROPEAN-LEVEL AND NATIONAL ACTIVITIES SUPPORTING THE DRAFT OBJECTIVES OF THE EUROPEAN SPACE PROGRAMME

The following tables provide an overview by space domain about activities that are currently on-going and envisaged for the short to medium term by the actors taking part in the European Space Programme and that are disposed to support the draft programmatic objectives outlined in chapter 2.

3.1. Satellite Navigation

Programmatic Objectives	**Activities**
Proceeding with the full-fledged development of the GNSS infrastructure	**I. European-level :** – Galileo IOV and EGNOS/GNSS support programme (funded by EC and ESA and technically managed by ESA) – Galileo FOC deployment and Galileo EGNOS operations managed by the Galileo Supervisory Authority (GSA) and the Galileo Operating Company (GOC) under a concession contract. Giove-A (2005), Giove-B (2007), IOV 1-2-3-4, FOC
Preparation of future GNSS infrastructures: Launch of technology demonstration of 2nd generation PNT System	**I. European level :** FP7 Programme (GSA) GNSS Evolution Programme (under preparation by ESA)
	II. National level : National PNT-related technology development
Promoting the use of PNT systems within integrated applications	**I. European-level :** GSA: FP7 SESAR (air traffic management) Proposed ESA Integrated Applications Programme
	II. National level : – Diverse National applications development activities [e.g. GATE (Galileo test environment for hardware, applications and services) (D), Galileo Test Range project (I), Navigation Project (F)] – National PNT-related technology developments [e.g. Argos 3/Sarsat 3 (F), GATE (D), HIGAPS, INDOOR, GALTEC, SEAGATE (D)]
Ensuring implementation of international partnerships on GNSS	**I. European level :** EC activities with technical support from GSA: cooperation with the United States (Galileo/GPS-Agreement of July 2004), Russia (GLONASS, negotiations ongoing) and other countries relating to interoperability and compatibility of Galileo with existing and coming GNSS Systems. ESA activities relating to Galileo and EGNOS

3.2. Earth Observation

Programmatic Objectives	Activities
Proceed with **GMES** space component development based on national and ESA developed assets	**I. European level :** – GMES Space Component Programme (ESA) **Planned :** GMES Sentinel 1a (2011) and 2a (2012), Sentinel-3a (2012), Sentinel-1b and 2b (2013), Sentinel-3b (2014) – FP7-Space Theme: Contribution to the GMES Space Component (EC) – Coordination of national or bilateral/multilateral EO mission developments
	II. National level : – National technology development programmes/Preliminary activities and precursor missions, e.g. PASO studies (F), SAFARI (D), METIMAGE (D) – Development of national or bilateral/multilateral EO missions **Under operation:** TerraSAR-X (2006/D), DMC/Disaster monitoring constellation (UK2002/2005), Spot-4/5, Jason-1 (2001/F) **Planned:** Rapid-Eye (2007/D), TanDEM (2009/D), TerraSAR-X 2nd gen. (2012), Venus (2009/F), SARAL (2009/F) En MAP (2010/D), Bissat (2010/I) Future Spanish EO satellite, Future Norwegian Sea monitoring satellite; Pleiades (2008/F), Cosmo-SkymMed (2007/08/09/I) Cosmo-Skymed 2nd gen. (2012/2013/I), Pleiades (2009/2010/F-B), SVEA: Swedish national surveillance mission, HYPSEO (I), Microsat (I), Nanoform (I)
Reinforce dialogue with user communities and foster the development + validation of new services and applications, also by exploring mechanisms for data provision and management (space and in-situ), focusing in the first place on a set of GMES fast-track services in the field of: – Emergency Management – Land Monitoring – Maritime Services – Atmospheric services (in preparation)	**I. European level :** – FP7-Space Theme (e.g. grant agreement or other mechanisms for space and non-space data provision). Additional activities foreseen in other FP7 themes (e.g. ICT, environment), in JRC direct actions, and in other EU sectoral policies (e.g. agriculture, fisheries, development, …) (EC) – GMES Service element transfer activities (ESA) – EUSC activities in support of EU Security Policies
	II. National level : – Availability of national or regional data – Other service and product development activities: [e.g. SIASGE (Italian-Argentinian cooperation on emergency EO satellites/Cosmo-Skymed); Disaster Management Pilot project (I); MOSAIC (Microsatellites Applications in collaboration(UK); Stereo programme (B); Project on development of application products and Cosmo-SkyMed Ground segment (I); SatHav (maritime applications) and SatNat (land applications) (N); National Earth observation Users' Platform (NL); Ether, Mercator, Postel, Aviso, Icare (F); EO centres of excellence (UK) DeCover, DeSecure, DeMarine, Enviland(D)]
Reinforce dialogue within appropriate international bodies in view of embedding GMES into the GEOSS infrastructure	**I. European level :** **a) EC:** FP7-Environment Theme (additional activities foreseen in other FP7 themes (e.g. ICT, Space) and in JRC direct action) **b) ESA:** Availability of Earth observation data (e.g. Webportal, Data Clearinghouse) **c) EUMETSAT:** Continuation of Satellite Application Facilities, Geonetcast
	II. National level : National contributions

Ensure continuity of European capacities in operational meteorology: – developing and operating state-of the-art meteorology missions – developing and operating innovative meteorological services and applications	**I. European level :** – Development of meteorological satellites, also contributing to GMES (ESA/EUMETSAT) **Under operation:** Meteosat 5/6/7/8/9 (1991/93/97/02/05), Metop-A (2006) **Planned:**MSG-3 (2009), METOP-B (2010), MSG-4 (2012), MTG (2015) METOP-C (2015); Post-Eumetsat Polar System (EPS) satellite generation studies – Development of associated services and applications (EUMETSAT) EUMETSAT Satellite Application Facilities (SAFs) within the Applications ground segment: Ocean + Sea Ice, Ozone Monitoring, Climate Monitoring, Numerical Weather prediction, Land surface analysis. High precision weather forecast for 4D-aircraft trajectory prediction (SESAR).
	II. National level activities, e.g. Jason-2 (2008/F), METIMAGE (D).

3.3. Satellite Communications

Programmatic Objectives	**Activities**
Development of advanced satellite communication technologies in cooperation with industry and operators leading to new demonstration missions, also by taking into account dual-use requirements	**I. European level :** **EC: In FP7 and TEN-T, general (i.e. non-proprietary space) technologies development in research programmes in TREN, ENTR, RTD and INFSO.** **ESA:** Preparatory mission, system and general configuration studies, technology for satellite based telecom and multimedia, development of payloads and ground segments, in-orbit validation, Alphabus/Alphasat, Small GEO platform (Artes-11 programme) ; Preliminary System and architecture studies (Proposed contribution to European Integrated Secured Communication network) Hylas, Alphasat (2010), Small GEO satellite
	II. National level : National telecom-related technology R+D activities: payload development (e.g. Programme Stentor (F);COMED NG/Santana/LCT (D); National in-kind contributions (Alphasat), telecom-related technology activities (I), parallel platform development programme (D) Spainsat/Xtar (E), Athena-Fidus (2010/F/I)
Increasing integration – with terrestrial systems in support of European and global communication infrastructures – with other application domains	**I. European level :** **EC:** FP7: ICT Challenge, Pervasive and trusted network and service infrastructures **ESA:** Telecom application demonstration (e.g. Artes). Possible future Data-Transmission System (DTS) including a data relay component in support of Earth observation missions (proposed DTS architecture and technology study within TRP/GSTP)
	II. National activities : Integration of space/terrestrial infrastructures (e.g. 'Village communicant'/F), Institutional Communication for security and emergency (I)

Develop end-user services increasing quality, quantity and variety of data by developing a multimedia satellite system (merging mobile, broadband and broadcast)	**I. European level :** **EC:** FP7, TEN-T, Space Theme: Space-based end-user application developments (e.g. GMES, Galileo), Telemedicine; SESAR Joint Undertaking (air traffic management); ICT Pervasive and trusted network and service infrastructures **ESA:** Proposed contribution to SESAR as well as telemedicine applications
	II. National activities : TANGO: Telecom advanced networks for GMES operations (F); Activities in support of the integration of telecom and navigation services (e.g. D), Tele-Education/Tele-Medicine project (I)
Provision of a harmonised regulatory environment on a pan-European scale (e.g. concerning spectrum availability, service licensing).	**I. European level :** **EC:** Revised eCommunications and TV without frontiers regulation directives.Harmonised spectrum and standardisation activities (EC with ESA support).
	II. National activities: Harmonised spectrum and standardisation activities.

3.4. Science and Technology

3.4.1. Space Science

Programmatic Objectives	**Activities**
Focusing on specific priority issues: – Life and planetary formation – Solar System – Fundamental laws of the Universe – Origins and evolution of the Universe	**I. European-level :** – ESA Scientific Programme: Cosmic Vision 2025 – EC: FP7 activities for the optimal preparation of scientific payloads and for the effective scientific exploitation of their data. **Under operation:** HST (1990/US), SOHO (1995), Newton (1999/US), Cluster2 (2000), Integral (2002), Mars Express (2003), SMART-1 (2003), Rosetta(2004), Double Star (2003/04/China), Venus Express (2005), AKARI/Astro-F (2006/Japan), Solar B (2006/Japan) **Planned:** Chandrayaan1 (2007/India), Herschel-Planck (2008), Lisa PF (2009), Lisa, Gaia(2011), Bepi-Colombo (2013), MIRI/ JWST (2013/US) , Solar Orbiter (2015)
	II. National activities : – National in-kind contributions to ESA missions by ESA Member States and European Cooperating States – National science programmes: Development of instruments/platforms relying notably on national technical centres for R+T for orbital systems (e.g. Platform for mini-satellites Myriade and Proteus(F)), – Balloon operation centre (F), Long-duration stratospheric balloons: SnowCake/ Boomerang (I) **Under operation:** Corot (2006/F) **Planned:** Picard (2008/F), T2L2 (2008/F), Pharao/ACES (F, CH), Microscope(2009/F), Taranis (F), Smese (F), Agile (I), New hard x-ray mission (2010/I), eRosita (2011+/D)
Supporting synergies of space science activities with other science activities and towards applications	Diverse national data exploitation activities (e.g. CNES, DLR, ASI Science Data Center) [Scientific data treatment, archiving, processing capabilities, including data valorisation for ESA and national missions] Link between Space Science and Exploration activities (e.g. Exomars)
Increasing international cooperation activities	– Activities performed by ESA, its Member States and Cooperating states

3.4.2. Earth Science

Programmatic Objectives	**Activities**
Developing new missions in support of core topics: – Ocean/Hydrosphere – Air/Atmosphere – Ice/Cryosphere – LandSurface/ Biosphere – Solid Earth/ Geosphere	**I. European level :** – Earth Observation Envelope programme/Earth Explorer missions (ESA) – FP7 Space work programme/actions area strengthening of the foundations of space sciences and technology (EC) **Under operation:** ERS-2 (1995), ENVISAT (2002) **Planned:** GOCE (2007), SMOS (2007), ADM-Aeolus (2008), Cryosat-2 (2009), SWARM (2010), EarthCare (2012)
	II. National level : – Development of instruments/platforms relying notably on national technical centres and of full-fledged national missions. – National in-kind contributions to ESA missions by ESA Member States and European Cooperating States **Under operation:** Champ (2001/D), Jason-1 (2001/F), Odin (2001/S), GRACE (2002/D), Parasol (2004/F), Demeter (2004/F), Calipso (2006/F), Spot 4/5 (F), Rosa (I) **Planned:** Jason-2 (2008/F), MeghaTropiques (2009/F), Venus (2009/F), SARAL (2009/F)
Ensuring effective exploitation of science data in conjunction with EO applications within GMES	– ESA and national data treatment capabilities (e.g. CADTS Centre Archivage et Traitement Données SMOS/ F, NL-SCIA-DC Sciamachy Data Center, Matera Space Geodesy Center (I)) – National data valorisation activities/R+D for pilot applications/product development (e.g. Ether, Mercator, Aviso, Icare, Postel/F); German Remote Sensing Center DFD/D)
Increasing international cooperation activities	– Activities performed by ESA, its Member States and Cooperating States

3.4.3. Technology

Programmatic objectives	**Activities**
Maximising synergies between civil and defence, space and non-space technology developments Identifying critical technologies and perform associated technology demonstration missions	**I. European level :** – Basic Technology Research programme/TRP (ESA) – General Support Technology Programme/GSTP (ESA) – European Component Initiative – Technology Transfer Programme/TTP (ESA) – ESA proposed NEWPro (technologies focusing on non-dependence, spin-in, security) – Proposed in orbit demonstration for technologies and techniques (ESA) – FP7 Space Work Programme/actions area strengthening of the foundations of space sciences and technology (EC) **Planned:** Proba-2, Proba-3, Expert. **Proposed:** Further Proba elements for technology demonstrators and precursors
	II. National level : – National transversal technology R+D programmes **Planned:** Prisma (S), Simbol-X (F), Tandem-X (D), TET108/210 (D), Future national micro-satellite missions
Harmonising technology developments	**Technology harmonisation (ESA and EC)** **European Space technology Platform, European Space Technology Master Plan**

3.5. International Space Station and Exploration of the solar system

Programmatic objectives	Activities
Ensuring maximum scientific return on investment and optimum utilisation of the ISS Strengthening life and physical sciences activities in support of non-space applications and exploration-related activities	**I. European level :** – ISS Exploitation Programme (ESA) **Planned:** Node-2 (2007), ATV-1 (2007), Columbus (2007), ERA (2009) ATV-2(2009), ATV-3(2011), ATV-4(2012), ATV-5(2013) – ISS utilisation programme/ELIPS (ESA) **II. National level :** – Nationally funded experiments within the ELIPS programme – National contributions to the ISS: [e.g. Declic facility/F; Multiuser facilities for Columbus/D; Pharao ACES (F, CH)] – National activities promoting the commercial use of ISS. – National infrastructure/activities: e.g. Cardiolab (D/F), Neurolab (D); Cardiomed (F); DCMC (I), OSMA (I), MOMA/Biotech applications (I), GPM and CAB (I) – User Support Operational Centre USOC's: e.g. CADMOS (F), MUSC (D), Immulab (D), BEC-Lab (D)
Preparing and demonstrating core capabilities (enabling technologies and infrastructures) for next step in exploration, notably for robotic Mars exploration and possible activities linked to moon exploration and cooperation with international partners on human space transportation according to scenario to be decided by Member States	**I. European level :** Proposed Aurora Core Programme (MSR, MSR precursor mission, Lunar exploration/Moon Orbit infrastructure) Preliminary studies Crew Space Transportation System) (ESA) FP7 Space work programme/actions area strengthening the foundations of space science and technology (EC) **Planned:**ExoMars mission (2013)
	II. National technology development in support of exploration : e.g.: – MSL-Mars Surface laboratory (F) – Network of geophysical stations on Mars (2011/F) – Moon exploration (I, D) – Inflatable structures-FLECS (I)

3.6. Access to space

Programmatic Objectives	Activities
Maintaining Europe's space port (Guiana Space Centre) under operational conditions/launch infrastructure	**I. European level:** – CSG Kourou (ESA) – Ariane 5 Infrastructure (ESA) – VEGA (ESA) – Soyuz at CSG (ESA), partly supported by Soyuz in Kourou/FP7 (EC)
	[II. National launch infrastucture] **CNES-CSG Kourou (F)** Esrange rocket range (S) Andoya rocket range (N), Other national rockets ranges: e.g. Broglio Space Center (I), Broglio launch base Trapani (I), Mobile rocket base (MORABA/D), Propulsion Test Center Lampoldshausen (D), Malindi (I)
Consolidating the European family of launchers: Ariane 5, Vega, Soyuz at CSG	**I. European level:** – Ariane (ACEP, ARTA, EVOLUTION, PLUS, EGAS, …) (ESA) – VEGA(VERTA) (ESA) – Soyuz at CSG (ESA), partly supported by Soyuz in Kourou/FP7 (EC)
	II. National technical support to Ariane, Vega. – CNES/F as prime contractor for Soyuz at CSG. – Exploration of potential upgrades for Ariane and Vega/Evolution of the family of Launchers e.g. Ariane (F) and VEGA surveillance (I)
Preparing technological and industrial capabilities for the development of next generation launchers	**I. European level:** – FLPP 1, FLPP 2 (ESA) – Re-entry technology: Expert (ESA) – FP7 programme on the Strengthening of space foundations (EC)
	II. National R+T for future launchers – R+T launchers and phases 0/A (F) – Launcher development activities: [Tekin 2010, Tehora 3, Astra, Phoenix 1, TETRA, Tanks and structures (D); Future launchers/LYRA (I) – Re-entry technology: [SHEFEX(D); Pre-X(F), Compere(D/F)]
Exploring possible long-term options for cooperation with strategic partners	– Agreement between ESA and the Russian Federal Space Agency on long-term cooperation and partnership in the field of development, implementation and use of launchers – First Implementing Arrangement between ESA and the Russian Federal Space Agency on cooperation in research and technology development for future launchers – France-Russia long-term cooperation/OURAL – EU-Russia Dialogue on Space Cooperation (EC, ESA)

4. INDICATIVE BUDGETS FOR MAJOR SPACE PROGRAMMES ON EUROPEAN LEVEL

ORIGIN	NAME OF PROGRAMMATIC ACTIVITY	TIMEFRAME	BUDGET/EXPENDITURE (in bn€)
European-level activities			
ESA	**Indicative figures (current e.c.) provided for ESA represent overall expenditure as indicated in ESA's Long Term Plan 2007-2016. They do not represent binding commitments for ESA Member States and include proposed future activities not yet approved.**		
	Navigation and Telecommunication	**2007-2013**	**3.4**
	Earth Observation	**2007-2013**	**4.5**
	Integrated Applications	**2007-2013**	**0.5**
	Basic Activities	**2007-2013**	**1.4**
	Science Programme and Science Support (Prodex)	**2007-2013**	**3.4**
	Technology	**2007-2013**	**0.8**
	Human Space Flight, Microgravity and Exploration	**2007-2013**	**4.2**
	Launchers	**2007-2013**	**5.0**
EC	**FP7 Space WP**	**2007-2013**	**1.4 (of which 85% for GMES)**
	FP7 Transport WP	**2007-2013**	**0.45 (incl. SESAR)**
	FP7 Environment, ICT	**2007-2013**	**Not determined (annual commitments)**
	Galileo budget line	**2007 onward**	**1,0 (under review)**
	Activities other than Research or Galileo (e.g. AGRI, FISH, DEV, REGIO, …)	**2007 onward**	**Not determined (annual commitments)**
EUMETSAT	**MSG**	**1992-2018**	**2,1 incl. ESA contribution of 400 M€**
	EPS	**1994-2019**	**2,4 (estimates), incl. ESA contribution of 550 M€**
	Post-EPS	**2012-2034**	**2,4 (estimates)**
	MTG	**2015-2034**	**2,5 (estimates), incl. ESA contribution**
National-level activities			
Taking 2006 as a reference year, national programmes, including civil and defence-dedicated activities account for approximately 40 % of the overall European space effort.[1]			

[1] In line with figures provided by EUROCONSULT.