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KUMMISSJONI TAL-KOMUNITAJIET EWROPEJ

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DOKUMENT TA' HIDMA MILL-PERSUNAL TAL-KUMMISSJONI

Programm Spazjali Ewropew - Elementi Preliminari

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1. DAHLA: IR-RAĠUNI GHALL-PROGRAMM SPAZJALI EWROPEW

Il-**Programm Spazjali Ewropew** jikkostitwixxi l-bażi programmatika **komuni, inklussiva u flessibbli**, li fuqha l-Ewropa twettaq l-attivitajiet spazjali tagħha billi tutilizza r-riżorsi disponibbli bl-aktar mod effiċjenti fil-livelli kollha. Il-Programm għandu jkun konformi ma' l-għanijiet u l-linji gwida stabbiliti fil-**Politika Spazjali Ewropea** u jipprovdi għanijiet programmatiċi għall-qasam spazjali bħala appoġġ għall-implimentazzjoni tiegħu. Dan jippermetti lill-atturi ewlenin involuti jimmonitorjaw il-progress miksub u jappoġġa l-isforzi tagħhom sabiex **tiżdied it-trasparenza, titnaqqas id-duplikazzjoni bla hteġa u tissaħħah il-kumplimentarjetà** fost il-programmi kollha marbuta ma' l-ispazju. B'hekk dan għandu jgħin biex fiż-żmien dovut jinkiseb sforz Ewropew koordinat u kongunt fil-qasam spazjali, bħala tweġiba għall-htigijiet u r-rekwiziti ta' l-utenti Ewropej u nazzjonali.

L-atturi Ewropej li jieħdu sehem fil-Programm huma

- **L-Aġenzija Spazjali Ewropea (ASE):** L-elementi ewlenin għat-twassil tagħha se jkunu l-programmi obligatorji u volontarji ta' l-Aġenzija fl-istrateġija fit-tul ta' l-ASE filwaqt li jitqiesu attivitajiet oħra intergovernattivi, kapaċitajiet nazzjonali u ta' l-UE sabiex jiġu organizzati b'mod effettiv is-sinergiji u l-istrateġiji integrati bejniethom.
- **L-Unjoni Ewropea (UE):** L-elementi ewlenin għat-twassil tagħha se jkunu b'mod partikolari s-seba' Programm ta' Qafas għar-Riċerka u l-Iżvilupp Teknoloġiku (PQ7) u l-programmi tan-Netzwerk Tranż-Ewropew u r-riżorsi li ġejjin minn sorsi mhux marbuta mar-riċerka u l-iżvilupp.
- **L-Istati Membri:** Il-programmi spazjali nazzjonali, mibdija u mwettqa fil-livell ta' l-Istati Membri b'konformità mar-regoli u l-istrumenti ta' finanzjament nazzjonali, qed jirrispondu għall-htigijiet nazzjonali filwaqt li jimmiraw ukoll li jappoġġaw l-għanijiet usa' tal-Politika Spazjali Ewropea. L-attivitajiet bilaterali u multilaterali jagħtu kontribut ukoll.
- **Organizzazzjonijiet intergovernattivi oħra li joperaw fuq il-livell Ewropew,** b'mod partikolari l-aġenziji li joperaw u jisfruttaw l-assi spazjali Ewropej bħall-Organizzazzjoni Ewropea għall-Isfruttament ta' Satelliiti Meteoroloġiċi (EUMETSAT).

L-attivitajiet imwettqa fl-**industrija Ewropea u minn operatori u fornituri tas-servizzi** jeħtieġ li jitqiesu kif xieraq u li tkun żgurata l-kooperazzjoni mill-qrib fir-rigward tar-riċerka u l-iżvilupp teknoloġiku kif ukoll l-iżvilupp ta' missjonijiet u l-operazzjonijiet. L-iskemi ta' paternarjat pubblika-privata (SPP) għall-applikazzjonijiet u l-forniment tas-servizzi għandhom jiġu żviluppati aktar.

L-elementi preliminari tal-Programm Spazjali Ewropew fl-oqsma ta' l-**Applikazzjonijiet u l-Fondazzjonijiet** jirrapprezentaw gabra mhux vinkolanti ta' attivitajiet li qed isiru bħalissa u li huma intiżi għall-gejjieni fil-medda l-qasira u f'dik tan-nofs. Huma jikkorrispondu mal-kontribuzzjonijiet ipprovduti mill-partijiet interessati rispettivi, bl-għan li jżidu t-trasparenza ta' attivitajiet spazjali eżistenti fl-Ewropa. Fil-qasam ta' l-applikazzjonijiet, tingħata attenzjoni partikolari lil programmi Ewropej kongunti bħalma huma l-GMES u l-GALILEO.

L-attivitajiet deċiżi qabel it-twaqqif tal-Politika Spazjali Ewropea huma mqassma skond l-għanijiet derivati mill-Politika Spazjali Ewropea – eżerċizzju li se jżid il-koerenza hekk kif il-

Programm jiġi aġġornat b'mod suċċessiv. Aktar attivitajiet fuq livell ta' dettall aktar baxx b'hall-iżvilupp ta' pizijiet tat-tagħbija (*payloads*), strumenti jew esperimenti speċifiċi, ma jidhrux f'dan id-dokument, iżda jikkontribwixxu b'mod attiv għall-isforz globali fil-qasam spazjali Ewropew.

Il-kontenut tal-Programm u l-metodoloġija ta' l-użu tiegħu se jkunu **riveduti u aġġornati** b'mod regolari b'koordinazzjoni mill-qrib ma' l-utenti u l-partijiet interessati kollha sabiex jirrifletti u jkun adattat għall-għanijiet tal-politika globali. **L-attivitajiet tal-ġejjieni għandhom ikunu inklużi b'mod gradwali sabiex jibnu qafas strateġiku koordinat u komuni**, li juri l-kumplementarjetà ta' l-attivitajiet spazjali fl-Ewropa kollha. Wara aktar diskussjoni fil-Grupp ta' Livell Għoli għall-Politika Spazjali (HSPG) dwar l-ambitu ġejjieni u t-tifsila speċifika tal-Programm Spazjali Ewropew, l-ewwel reviżjoni tad-dokument għandha tithejja matul l-2007 u l-2008 mis-Segretarjat Kongunt ta' l-ASE u tal-KE. Ir-reviżjoni se tqis it-tnejn tal-Kunsill Ministerjali ta' l-ASE u l-evoluzzjoni ulterjuri tal-programmi tal-KE u tal-pjanijiet nazzjonali. Il-Programm Spazjali Ewropew rivedut se jkun ipprezentat lill-Hames laqgħa tal-Kunsill Spazjali sabiex ikun approvat permezz ta' l-adozzjoni formali tiegħu mill-Kunsill Kompetittiv u mill-Kunsill ta' l-ASE fuq il-livell Ministerjali.

L-Istati Membri huma għalhekk mistiedna li jgħarrfu lis-Segretarjat Kongunt ta' l-ASE u tal-KE dwar il-programmi godda mhejjija kif ukoll dwar l-aġġornamenti tal-programmi eżistenti; it-tagħrif għandu juri kif dawn il-programmi huma kompatibbli ma' l-għanijiet u l-linji gwida tal-Politika Spazjali Ewropea.

It-tagħrif dwar il-baġits indikattivi għall-perjodu 2007-2013 huwa pprovdut għall-attivitajiet ewlenin fuq il-livell Ewropew. Matul il-fażi ta' reviżjoni tal-Programm Spazjali Ewropew, għandu jingabar tagħrif dettaljat simili dwar il-baġit nazzjonali għal kull qasam spazjali. Id-dokument attwali jagħti indikazzjoni dwar il-piż globali ta' programmi nazzjonali fi hdan l-isforz globali fil-qasam spazjali Ewropew billi jindika s-sehem tagħhom f'perċentwali, filwaqt li jagħżel l-2006 bħala s-sena ta' referenza. L-inklużjoni ta' attività fil-qafas tal-Programm Spazjali Ewropew ma timplikax xi skambju ta' fondi jew trasferiment ta' responsabbiltà fost il-partijiet interessati.

2. L-ABBOZZ TA' L-GĦANIJET PROGRAMMATIĊI

Bħala appoġġ għall-għanijiet politiċi globali li jissemmwew fl-istqarrija tal-missjoni Strateġika tal-Politika Spazjali Ewropea, il-Programmi Spazjali Ewropej jidentifikaw għanijiet programmatiċi għal kull qasam spazjali, fuq il-bażi ta' proviżjonijiet fi hdan id-dokument tal-Politika Spazjali Ewropea, fil-pjan fit-tul ta' l-ASE għall-2007-2016 u fis-seba' Programm ta' Qafas għar-Riċerka u l-Iżvilupp Teknoloġiku (PQ7). L-implimentazzjoni għandha tibni fuq attivitajiet li jkunu għaddejjin u fuq daww fil-medda l-qasira u f'dik tan-nofs, kif jissemmwew fil-kapitlu 3.

Ghanijiet globali tal-Politika Spazjali	L-Abbozz ta' l-Ghanijiet Programmatiċi
APPLIKAZZJONIJIET Sabiex titqies l-evoluzzjoni tal-htigijiet ta' l-utenti, għandhom jiġu żviluppati sistemi spazjali integrati u għandhom jiġu promossi sistemi spazjali u terrestri, sabiex ikunu pprovduti servizzi effettivi u effiċjenti f'termini ta' nfiq.	
IN-NAVIGAZZJONI BIS-SATELLITA	
– Jitrawmu l-innovazzjoni, il-kompetittività u t-tkabbir ekonomiku. – Jintlaħqu l-htigijiet ta' sigurtà ta' l-Ewropa. – Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapaċitajiet godda u kritiċi.	Jiżgura l-indipendenza Ewropea fir-rigward ta' teknoloġija avanzata ta' navigazzjoni bis-satellita u jiżviluppa servizzi offruti minn sistemi ta' navigazzjoni li jżidu l-kwalità, il-kwantità u l-varjetà ta' data offruta u jagħtu kontribut għall-kompetittività ta' l-industrija Ewropea, billi: • Jkompli l-iżvilupp shih ta' l-infrastruttura GNSS • Ihejji l-infrastrutturi GNSS għall-gejjieni u jniedi l-wirja teknoloġika ta' Sistema PNT tat-tieni generazzjoni • Il-promozzjoni ta' l-użu ta' sistemi PNT fi hdan applikazzjonijiet integrati • Tkun żgurata l-implimentazzjoni ta' shubija internazzjonali dwar il-GNSS
L-OSSERVAZZJONI TAD-DINJA:	
– Jitrawmu l-innovazzjoni, il-kompetittività u t-tkabbir ekonomiku. – Jintlaħqu l-htigijiet ta' sigurtà ta' l-Ewropa. – Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapaċitajiet godda u kritiċi. – Jintlaħaq l-interess pubbliku Ewropew fit-tfassil ta' politika sostenibbli fil-qasam ta' l-Ambjent u t-Tibdil fil-Klima	L-iżvilupp ta' l-infrastruttura Ewropea shiha għall-Osservazzjoni tad-Dinja u ta' servizzi operattivi assoċjati għall-Ambjent u s-Sigurtà, filwaqt li jitqiesu l-assi b'użu doppju, billi: • Jitkompla l-iżvilupp ta' komponent spazjali tal-GMES fuq il-bażi ta' l-assi żviluppati fuq livell nazzjonali u ta' l-ASE. • Jissahħaħ id-djalogu mal-komunitajiet ta' l-utenti u jitrawmu l-iżvilupp u l-validazzjoni ta' servizzi u applikazzjonijiet godda, filwaqt li tkun esplorata l-politika dwar id-data, u l-mekkaniżmi għall-forniment u l-ġestjoni tad-data (fl-ispażju u fuq il-post) b'attenzjoni l-ewwelnett fuq gabra ta' servizzi aċċellerati tal-GMES sa l-2008. • Jissahħaħ id-djalogu fi hdan il-korpi internazzjonali adattati; Jiġi identifikat is-sehem tal-GMES fi hdan il-GEOSS • Tkun żgurata l-kontinwità tal-kapaċitajiet Ewropej fil-meteoroloġija operattiva
IL-KOMUNIKAZZJONIJIET BIS-SATELLITA	
– Jitrawmu l-innovazzjoni, il-kompetittività u t-tkabbir ekonomiku u tinkiseb it-tmexxija tas-suq fl-ispażju kummerċjali. – Jintlaħqu l-htigijiet ta' sigurtà ta' l-Ewropa. – Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapaċitajiet godda u kritiċi.	Jikkontribwixxi għall-kompetittività ta' l-industrija spazjali Ewropea u għall-iżvilupp tas-soċjetà ta' l-informatika fl-Ewropa, billi: • Jiżviluppa teknoloġiji avanzati ta' komunikazzjoni bis-satellita b'kooperazzjoni ma' l-industrija u l-operaturi li jwasslu għal missjonijiet godda ta' dimostrazzjoni, filwaqt li jitqiesu r-rekwiżiti b'użu doppju • Tiżdied l-integrazzjoni mas-sistemi terrestri bħala appoġġ għall-infrastrutturi Ewropej u globali ta' komunikazzjoni u tinholq rabta ma' oqsma oħra ta' applikazzjoni • Jiġu żviluppati servizzi għall-utent aħħari offruti minn komunikazzjonijiet bis-satellita li jżidu l-kwalità, il-kwantità u l-varjetà ta' data, u jkunu żviluppati sistemi multimedjali bis-satellita (li jgħaqqad flimkien t-telekomunikazzjoni ċellulari, <i>broadband</i> u <i>mxandra</i>).
SIGURTÀ U DIFIŻA L-iżviluppi nazzjonali u Ewropej fil-gejjieni.	

– Jintlaħqu l-htigijiet ta' sigurtà u difiża ta' l-Ewropa. – Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapacitajiet godda u kritiċi.	L-iżviluppi nazzjonali u Ewropej fil-ġejjieni.
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FONDAZZJONIJIET

IX-XJENZA U T-TEKNOLOĠIJA

- Jitrawmu l-innovazzjoni, il-kompetittività u t-tkabbir ekonomiku
- Jissahhah il-kontribut tar-riċerka spazjali għas-soċjetà bbażata fuq l-għarfien
- Jintlahqu l-htigijiet ta' sigurtà ta' l-Ewropa
- Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapaċitajiet godda u kritiċi
- Jintlahaq l-interess pubbliku Ewropew fit-tfassil ta' politika sostenibbli fil-qasam ta' l-Ambjent u t-Tibdil fil-Klima

IX-XJENZA SPAZJALI

Fil-kuntest ta' l-Aġenda ta' Liżbona u ta' l-azzjonijiet ta' l-ASE bhala appoġġ għall-kompetittività u għall-iskoperta, tiġi żviluppata tmexxija xjentifika globali u tkun estiża bażi ta' għarfien, billi:

- tinghata attenzjoni lil kwistjonijiet speċifiċi ta' prijetà: Il-hajja u l-formazzjoni Planetarja, is-Sistema Solari, il-ligijiet fundamentali ta' l-Univers, l-Origini u l-evoluzzjoni ta' l-Univers
- Jinghata appoġġ lis-sinergiji ta' attivitajiet xjentifiċi spazjali ma attivitajiet xjentifiċi oħra u applikazzjonijiet teknoloġiċi
- Jizdiedu l-attivitajiet ta' kooperazzjoni internazzjonali

IX-XJENZA TAD-DINJA

L-espansjoni ta' l-attivitajiet tax-Xjenza tad-Dinja bl-ghan li jappoġġaw l-istima tal-bidla globali u l-politika ambjentali, billi:

- Jiġu żviluppati missjonijiet godda bhala appoġġ għas-suġġetti prinċipali: Oċean/Idrosfera, Arja/Atmosfera, Silġ/Krijosfera, Wiċċ l-Art/Biosfera, id-Dinja Solida/Geosfera
- Jiġi żgurat l-isfruttament effettiv ta' *data* xjentifika b'konnessjoni ma' applikazzjonijiet ta' osservazzjoni tad-dinja fi hdan il-GMES
- Jizdiedu l-attivitajiet ta' kooperazzjoni internazzjonali

IT-TEKNOLOĠIJA

Il-kontribut lill-innovazzjoni u lill-kompetittività, billi:

- Jiġu mmassimizzati s-sinergiji bejn l-iżviluppi teknoloġiċi fil-qasam ċivili u ta' difiża, spazjali u mhux spazjali
- Jiġu identifikati t-teknoloġiji kritiċi u jitwettqu missjonijiet assoċjati ta' dimostrazzjoni teknoloġika
- Jiġu armonizzati l-iżviluppi teknoloġiċi

L-ISTAZZJON SPAZJALI INTERNAZZJONALI U L-ESPLORAZZJONI TAS-SISTEMA SOLARI

- Jissahhah il-kontribut tar-riċerka spazjali għas-soċjetà bbażata fuq l-għarfien
- Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapaċitajiet godda u kritiċi

Il-kisba tal-benefiċċji xjentifiċi u teknoloġiċi ta' l-investimenti maghmula fil-proġett ISS u t-thejjija ta' l-attivitajiet ta' esplorazzjoni fil-gejjieni sabiex jinkiseb rwol ewlieni fi hdan l-istruttura ta' esplorazzjoni internazzjonali, billi:

- Jiġi żgurat l-aqwa ritorn xjentifiku ta' l-investment speċjalment fix-Xjenzi Fiziċi u tal-Hajja u l-ahjar użu ta' l-ISS
- Jissahhu l-attivitajiet dwar ix-Xjenzi Fiziċi u tal-Hajja bhala appoġġ għal applikazzjonijiet mhux spazjali u l-attivitajiet marbuta ma' l-esplorazzjoni.
- Jithejjew u jintwerew kapaċitajiet fundamentali (li jippermettu t-teknoloġiji u l-infrastrutturi) għall-pass li jmiss fl-esplorazzjoni, b'mod partikolari l-esplorazzjoni robotika ta' Mars u l-attivitajiet possibbli marbuta ma' l-Esplorazzjoni tal-Qamar. Ikun hemm kooperazzjoni ma' shab internazzjonali dwar it-trasport tal-bniedem fl-ispazju skond ix-xenarji li għandhom jiġu deċiżi mill-Istati Membri.

AĊĊESS GħALL-ISPAZJU

- Ikun żgurat l-aċċess bla restrizzjoni għal teknoloġiji, sistemi u kapaċitajiet godda u kritiċi.
- Jitrawmu l-innovazzjoni, il-kompetittività u t-tkabbir ekonomiku

Jinzamm l-aċċess indipendenti għall-ispazju, billi:

- Jinzamm il-port spazjali Ewropej (Ċentru Spazjali ta' Guiana) skond il-kondizzjonijiet operattivi
- Tiġi kkonsolidata l-familja Ewropea ta' mezzi għal lanċjar: Ariane 5, Vega, Soyuz fiċ-ĊSG
- Jithejjew u jitharsu l-kapaċitajiet teknoloġiċi u industrijali għall-iżvilupp ta' mezzi għal-lanċjar tat-tieni generazzjoni
- Jiġu esplorati l-għażliet possibbli fit-tul għal kooperazzjoni ma' shab strateġiċi

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	<u>I. European-level :</u> – 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 2 nd generation PNT System	<u>I. European level :</u> FP7 Programme (GSA) GNSS Evolution Programme (under preparation by ESA)
	<u>II. National level :</u> National PNT-related technology development
Promoting the use of PNT systems within integrated applications	<u>I. European-level :</u> GSA: FP7 SESAR (air traffic management) Proposed ESA Integrated Applications Programme
	<u>II. National level :</u> – 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	<u>I. European level :</u> 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	<u>I. European level :</u> – GMES Space Component Programme (ESA) <u>Planned :</u> 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 <u>II. National level :</u> – 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 <u>Under operation:</u> TerraSAR-X (2006/D), DMC/Disaster monitoring constellation (UK2002/2005), Spot-4/5, Jason-1 (2001/F) <u>Planned:</u> 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:	<u>I. European level :</u> – 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 <u>II. National level :</u> – 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	<u>I. European level :</u> 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 <u>II. National level :</u> 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	<u>I. European level :</u> – Development of meteorological satellites, also contributing to GMES (ESA/EUMETSAT) <u>Under operation:</u> Meteosat 5/6/7/8/9 (1991/93/97/02/05), Metop-A (2006) <u>Planned:</u>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).
	<u>II. National level activities, e.g. Jason-2 (2008/F), METIMAGE (D).</u>

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	<u>I. European level :</u> 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, Alphasat/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
	<u>II. National level :</u> 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	<u>I. European level :</u> 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)
	<u>II. National activities :</u> 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)	<u>I. European level :</u> 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
	<u>II. National activities :</u> 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).	<u>I. European level :</u> EC: Revised eCommunications and TV without frontiers regulation directives. Harmonised spectrum and standardisation activities (EC with ESA support).
	<u>II. National activities:</u> 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	<u>I. European-level :</u> – 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. <u>Under operation:</u> 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) <u>Planned:</u> Chandrayaan1 (2007/India), Herschel-Planck (2008), Lisa PF (2009), Lisa, Gaia(2011), Bepi-Colombo (2013), MIRI/ JWST (2013/US) , Solar Orbiter (2015)
	<u>II. National activities :</u> – 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) <u>Under operation:</u> Corot (2006/F) <u>Planned:</u> Picard (2008/F), T2L2 (2008/F), Pharo/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	– Activities performed by ESA, its Member States and Cooperating states

cooperation activities	
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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	<u>I. European level :</u> – Earth Observation Envelope programme/Earth Explorer missions (ESA) – FP7 Space work programme/actions area strengthening of the foundations of space sciences and technology (EC) <u>Under operation:</u> ERS-2 (1995), ENVISAT (2002) <u>Planned:</u> GOCE (2007), SMOS (2007), ADM-Aeolus (2008), Cryosat-2 (2009), SWARM (2010), EarthCare (2012) <u>II. National level :</u> – 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 <u>Under operation:</u> Champ (2001/D), Jason-1 (2001/F), Odin (2001/S), GRACE (2002/D), Parosol (2004/F), Demeter (2004/F), Calipso (2006/F), Spot 4/5 (F), Rosa (I) <u>Planned:</u> 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	<u>I. European level :</u> – 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) <u>Planned:</u> Proba-2, Proba-3, Expert. <u>Proposed:</u> Further Proba elements for technology demonstrators and precursors
Identifying critical technologies and perform associated technology demonstration missions	<u>II. National level :</u> – National transversal technology R+D programmes <u>Planned:</u> 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
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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	<u>I. European level :</u> - ISS Exploitation Programme (ESA) <u>Planned:</u> 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) <u>II. National level :</u> - Nationally funded experiments within the ELIPS programme - National contributions to the ISS: [e.g. Declic facility/F; Multiuser facilities for Columbus/D; Pharo 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	<u>I. European level :</u> 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) <u>Planned:</u>ExoMars mission (2013) <u>II. National technology development</u> 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	<u>I. European level:</u> – CSG Kourou (ESA) – Ariane 5 Infrastructure (ESA) – VEGA (ESA) – Soyuz at CSG (ESA), partly supported by Soyuz in Kourou/FP7 (EC) <u>II. National launch infrastructure]</u> CNES-CSG Kourou (F) Esrangle rocket range (S) Andoya rocket range (N), Other national rockets ranges: e.g. Broglie Space Center (I), Broglie 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	<u>I. European level:</u> – Ariane (ACEP, ARTA, EVOLUTION, PLUS, EGAS, ...) (ESA) – VEGA(VERTA) (ESA) – Soyuz at CSG (ESA), partly supported by Soyuz in Kourou/FP7 (EC) <u>II. National</u> 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	<u>I. European level:</u> – FLPP 1, FLPP 2 (ESA) – Re-entry technology: Expert (ESA) – FP7 programme on the Strengthening of space foundations (EC) <u>II. National R+T for future launchers</u> – 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.