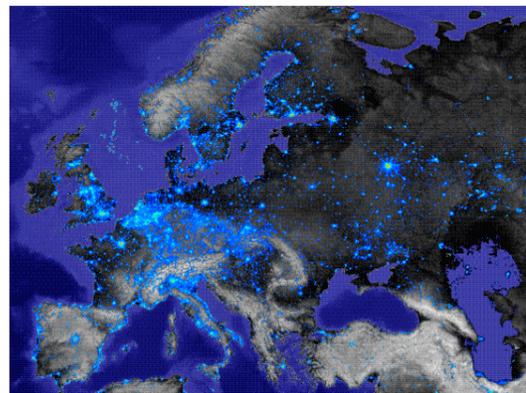


THE SETTING: THE IMPORTANCE OF SPACE UTILISATION

- The 2007 European Space Policy acknowledges that space is a strategic tool for independence, prosperity, industrial development, technological advance and scientific progress.
- Space is a public good, with beneficial impacts on everyday life, whose applications support European and global sustainable development in areas such as knowledge gathering and dissemination, population studies, mobility, resource prospecting and management, the environment and security.
- Space applications can both solve problems and create new opportunities in our changing society.
- Space is essential to implementing European sectoral policies, and to providing the European contribution to global commitments to deal with issues which have local repercussions.
- Space technology drives innovation and the creation of new jobs in numerous industries.
- Space applications are supporting the elaboration of new global standards and ethics thanks to their ability to observe and monitor Earth as a whole; they also support good governance at international, national and regional levels.
- The worldwide space industry is worth around € 174 billion and growing as an increasing number of countries (especially China and India) come to realise its importance. In 2006 the European space manufacturing industry had a turnover of € 5 billion and provided jobs to 29 000 people. In 2004, aerospace was the second highest export category in the EU (23%) after electronic communications. Lastly, at € 80 000 value added per person employed in 2002, apparent labour productivity in the EU's aerospace equipment sector was well above the EU average in manufacturing of € 45 000.



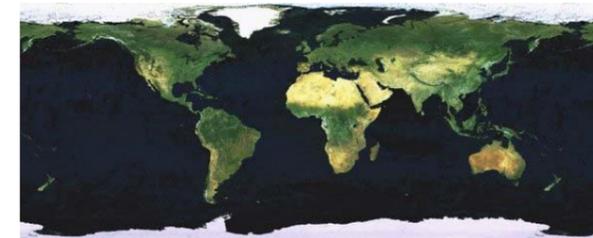
ACTION IS NEEDED IN EUROPE TO:

- develop and maintain an operational space infrastructure that meets the demands of European society ;
- cope with fragmented institutional markets at both European and national levels ;
- create dedicated and effective bodies with clear roles and responsibilities as well as the authority to federate respective institutional markets ;
- increase capacity building;
- support the 'integration' of the European space industry (through greater interaction with terrestrial industry) ;
- combine and integrate climate change research efforts.
- transform 'goodwill' disaster management actions into obligations to provide satellite-related services in times of natural and human-made disasters ;
- support the UN's use of space systems to meet global needs ;
- foster the application and promote the industrial advantages of dual-use technology ;
- promote the integration of space systems at local and regional levels ;
- sustain a competitive European space industry ;
- create educational and outreach projects to raise public awareness of the ubiquitous benefits of space technology and engender a more technology-friendly environment ;



„CASE FOR SPACE“

Space applications meeting societal needs



Palais Fanto
Schwarzenbergplatz 6
(Entrance: Zaunergasse 1-3)
A-1030 Vienna, Austria
Tel +43 1 718 1118 -0 / Fax -99

www.espi.or.at

Recommendations
addressed to
decision-makers in Europe

SERVING SOCIETY

The challenges facing European (and global) society cannot be met without using space technology. It is indispensable in areas such as:

Food management for the growing world population

The GMES Global Monitoring for Food Security service element will reduce uncertainty about food supply by 10-15% for 854 million undernourished people worldwide; satellite-based precision agriculture helps maximise crop production.

Securing the supply of energy

ESA's Environmental Information Service for Solar Energy Industries will reduce the operational costs of solar energy plants; its Envisat Monitoring and Forecasting Services for Offshore Industry can track potentially disruptive eddies and severe weather in near-real time; SPOT satellites aid the oil companies in geo-exploration and prospecting, especially underwater; improved weather forecasting allows energy companies to better balance supply and demand.

Improving healthcare

Satellite monitoring of air quality/dust clouds provides early warning to allergy and asthma sufferers; satellites can identify malaria-free areas with 96% accuracy and are providing mosquito control in Europe, as well as monitoring disease vectors; satellite-based early warning of extreme cold or heat (35 000 heatwave-related deaths in Europe in 2003) saves lives; European e-health pilot projects have shown a 1:3 cost-benefit ratio; research on astronaut health (breathing patterns, ageing) contribute to advances in medical techniques.

Multipurpose and multiscale land management

Satellites support cadastral systems; satellite data are useful for local, regional and national cartography and in surveillance of distribution of EU agricultural subsidies.

Urban planning and management

(Use of) GIS and spatial information databases aids urban planning; Atlas Project; communication satellites supply traffic congestion early warning (in London the cost is € 4.5 million weekly)

Adapting to new patterns of production and employment

Space provides new job creation (e.g. in space-borne data analysis, information value-added services, navigation-related fleet management and container ship tracking); stimulation of technological innovation via spin-offs (e.g. ground-penetrating radar, materials and textile design and manufacture, anti-vibration technology)

Ensuring communications and access to information

Satellites provide telephony—Insat connects 75% of India's population—real time broadcasts (Olympic Games, news coverage), video conferencing, faster, more secure banking and financial transactions; satellites (e.g. those of Eutelsat) are bridging the regional and digital divide by providing broadband internet access to 25 million remote homes in Europe, e-learning is extending education to sparsely populated, rural areas.

Preserving the past

Remote sensing has uncovered new archaeological sites (space-based radar discoveries at Angkor Wat and in Egypt); ESA-UNESCO 'Open Initiative' assists developing countries to monitor their World Heritage Sites.

PROTECTING THE ENVIRONMENT

Space applications are a crucial tool for solving current and future environmental problems:

Understanding climate change and Earth systems through

satellite-enabled continuous and global measurement of sea levels and melting of ice caps, and monitoring of ozone holes, etc.; GMES-guided adaptation to climate change could save up to € 28 billion per year; GMES will provide the European contribution to the world-wide GEOSS.

Extreme weather

Eumetsat is using new satellite technology to increase the frequency and precision of meteorological forecasting.

Ecosystem change

Satellites are monitoring and tracking the major factors in ecosystem change (alteration in habitats and of wildlife migrations, spread of invasive species, pollution) and provide effective modelling of future developments.

Sustainable marine management

through measurement and monitoring of rising sea temperatures and oxygen deficiency in European seas; assessment of habitat change, over-fertilisation (eutrophication), algal blooms and (over) fishing; pollution control (Envisat component of the European Maritime Safety Agency's (EMSA): oil spill monitoring service; satellite-based mapping of European coastal waters aids spatial planning, safety at sea and international security.

Deforestation and forest management

Remote sensing complements ground-based observations to provide consistent, repeatable, cost-effective data on vegetation cover, pinpointing general deforestation, forest fires and illegal logging—a 5% reduction in deforestation could provide economic benefits of up to € 11 billion.

Freshwater scarcity

Space observation systems monitor water quantity and quality in lakes, rivers, wetlands, coastal areas and groundwater; they aid 3-D reservoir planning and drainage basin management; with telecommunications systems they provide multi-hazard early warning, and preparedness and response assessment of water stored in glaciers and ice-caps.

Enforcing Europe's domestic environmental regulations and international obligations

Remotely sensed data aid the implementation of EU Natura 2000, Water Framework and Plant Health Directives, and provide verification of the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques, as well as of nuclear non-proliferation and testing treaties; evidence from ESA's ERS satellites was admitted by a Singaporean court in prosecution of an oil tanker.

The influence of space weather on Earth's environment

Space-based research has enhanced our knowledge of solar ultraviolet, visible and heat radiation, and magnetic activity and of their influence on our climate and effect on crucial technologies.

Learning about our world by understanding the cosmos

Europe is a leader in space science through missions such as Mars Express, Venus Express, Rosetta, Cassini-Huygens and the Herschel space observatory, which, when launched in 2008, will be the largest telescope in space.

MANAGING RISKS

Space is a valuable instrument for reducing risk in the following fields:

Understanding and communicating the conditions for natural disasters

Satellite data can improve our understanding of earthquakes by monitoring changes in the Earth's electromagnetic field; communications satellites have doubled the warning time for tropical cyclones and hurricanes from 24 hours in 1990 to 48 in 1999.

Assessing the risks of natural disasters

High-resolution satellite imagery can be used for flood insurance risk management (e.g. the Italian SIGRA project), tsunami tracking and wildfire risk assessment.

Management and mitigation of natural and human-made disasters

Satellite positioning systems provide faster response and a complement to or even substitute for terrestrial infrastructure where this is lacking; GMES disaster management services could provide benefits of up to € 80 million per year; telemedicine allows in situ treatment of survivors using expertise from around the world.

Transport of hazardous goods

Satellite positioning and communications services ensure wireless monitoring, e.g. via the EU Standardised Hazardous Goods Transport Alerting (SHAFT) project.

Air and road traffic management

Signals timing enabled by navigation satellite ensures fewer delays in civil aviation take-off and landing and greater safety; Meteosat supplies cloud warnings every 15 minutes, while navigation services for air traffic control will permit shorter polar flights—and thus lower CO₂ emissions—and cost savings of up to € 30 000 per flight; satellite radio navigation can cut road travel time by 10-20%; Galileo will provide the infrastructure to mitigate the negative impacts of road transport.

Search and rescue

The COSPAS-SARSAT location system has assisted in the rescue of some 21 000 persons from air crashes, shipwrecks, etc and has also saved the lives of numerous mountaineers, rock climbers and yacht crews, thereby also saving coastguard and mountain rescue teams millions of euros.

Movement of refugees and illegal immigrants

As above, positioning systems aid the search for refugees and illegal immigrants stranded at sea in the Mediterranean and elsewhere; remote sensing data assist decision making on the sites of refugee camps and the monitoring of their size and conditions.

Trafficking of illegal goods

Satellites transmit data and imagery in real time between surveillance aircraft and surveillance centres.

Mass events

Satellites continuously transmit positioning data to secure timely traffic management measures and provide accurate weather forecasting.

(Inter)national security

By increasing transparency, satellite observations reduce the incentive for and risk of surprise attacks, verify compliance with truce agreements and peace treaties and thereby help keep the peace; space-based intelligence gathering can track terrorist movements; communication satellites contribute to transmission of information.

