

# European Union Space Policy

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Europe has achieved many successes in Space, thanks to the fruitful collaboration of Member States, the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and the European Union. Copernicus and Galileo/ EGNOS the two Union flagships are the result of this synergic cooperation. They are both fully operational and deliver world class services for Earth Observation and Satellite Navigation. Building on these successes, on 26 October 2016, the European Commission adopted the Space Strategy for Europe setting up a common vision and identifying a number of concrete actions to achieve its objectives. This was enriched by an intensive political debate and orientations provided by Council and Parliament. In view of the political changes at the horizon with the forthcoming elections, it is mandatory to ensure that Europe's successes in Space are ensured. As a result, last June this Commission adopted important proposals that will shape the future of Space in terms of programme components, research and innovation needs and investment ambitions.

## Copernicus

Copernicus is the European Union' Earth Observation Programme headed by the European Commission in partnership with the European Space Agency (ESA) that monitors the Earth and its many ecosystems, whilst ensuring that citizens are prepared and protected in the face of crises and natural or man-made disasters. Building on the foundations of deeply rooted scientific knowledge and on decades of EU investment in research and technological development, the Copernicus programme is exemplary of European strategic cooperation in space research and industrial development.

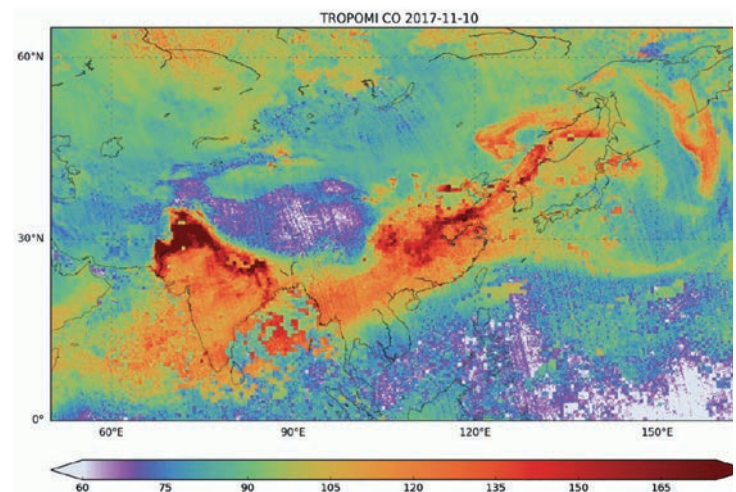
Copernicus brings together communities from across the geoinformation and environmental scientific spectrum, and delivers operational services that range from Arctic sea ice monitoring to emergency response, through oil spill detection and monitoring of urban sprawl. Copernicus services support a broad range of environmental and security applications, including climate change monitoring, sustainable development, transport and mobility, regional and local planning, maritime surveillance, agriculture and health.

Thanks to a variety of technologies, from satellites in space to measurement systems on the ground, in the sea and in the air, Copernicus delivers operational data and information services openly and freely. In this perspective, Copernicus is supporting the EU's role as a global actor and is contributing to solutions to common global challenges. One of the ten priorities of the Juncker Commission is to create a resilient energy union with a forward-looking climate neutral European economy by 2050.

The Copernicus Climate Change Service (C3S) will allow policy makers to adapt and mitigate policies based on consistent and authoritative data about climate change to assess its impacts and better address a sustainable management of resources. The C3S will also help monitor and achieve the EU 2030 objectives for climate change and energy, whose main targets are: a minimum 40% cut in greenhouse gas emissions compared to 1990; at least a 27% market share for renewable energy; and an improvement in energy efficiency of not less than 27%.

## Air pollution movement

Copernicus Sentinel-5P carbon monoxide measurements in November 2017 show long-range transboundary air



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pollution transport from India to China. Launched on 13 October, the Copernicus Sentinel-5P satellite has been used to map atmospheric carbon monoxide around the globe. The mission has a swath width of 2600 km, which allows the whole planet to be mapped every 24 hours. Thanks to its Tropomi instrument – the most advanced multispectral imaging spectrometer to date – Sentinel-5P can zoom down to the surface of Earth and deliver highly detailed and accurate data about the atmosphere.

## Galileo/EGNOS

With the declaration of Galileo Initial Services in December 2016, Galileo officially moved from testing phase to the provision of live services. For the first time ever, users around the world started using the positioning, navigation and timing information provided by European satellites.

In the lead up to Galileo Initial Services, many forward-looking companies have created Galileo-enabled receivers, chipsets and modules serving a variety of needs. With Galileo, the positioning information provided by our mobile devices, such as smartphones wearables and tablets, is more accurate and reliable – particularly in urban environments where narrow streets and tall buildings often block satellite signals and limit the usefulness of many mobile services.

To highlight just one recent example of how Galileo is helping European citizens during an emergency it is worth mentioning the Galileo's Search and Rescue (SAR) service. This service is Europe's contribution to an international co-operative effort on search-and-rescue activities – known as COSPAS-SARSAT. It will reduce the time it takes to detect a person lost at sea or in the mountains' from 3 hours to just 10 minutes after a distress beacon is activated, facilitating rescue operations and saving lives. The rescue teams can then make use of the European Geostationary Navigation Overlay Service (EGNOS), a fully operational regional satellite navigation system improving the accuracy and reliability of the US GPS signal over the European territory. Galileo is also at the core of the eCall UE initiative: since March 2018 all new car and light van models sold in the EU have to be fitted with eCall devices that automatically alert rescue services in the event of accident.



The aim is to promote the uptake of this service not only across all European Member States, but also worldwide. As an example, in November, the US Federal Communications Commission decided to grant a licence waiver for Galileo signal reception in the US. This means that Galileo is the first and only non-US satellite navigation system authorised for use in the US and that citizens and businesses in the US will be able to benefit from using Galileo. This also demonstrates the confidence that policy makers, on the other side of the Atlantic, have in our programme.

To build on our success the main goal for Galileo/EGNOS is to bring the constellation to completion in 2020. Besides, the Galileo High Accuracy Service will bring unprecedented 20cm level accuracy to users around the globe. This development is crucial for cutting-edge technologies like autonomous driving. Work is also ongoing for the Emergency Warning Service, which will swiftly inform people about emergencies such as natural disasters.

## Space Surveillance and Tracking (SST)

As European space infrastructure grows, there has been a growing need to ensure the security of space assets that have become indispensable to our economy and society. Actually, it is foreseen that by 2020 Europe will have around 40 EGNSS and Copernicus satellites. To address this, the SST Decision adopted on 16 April 2014<sup>(1)</sup> establishes a Space Surveillance and Tracking support framework whose general objective is to contribute to ensuring the long-term sustainability of European and national space infrastructure, facilities and services that are essential for the safety and security of the economies, societies and citizens in Europe.

The implementation procedures foreseen in the Decision led to the effective constitution of a Consortium in June 2015 and to the start of the provision of initial EU SST services in July 2016. The five pioneer States (DE, ES, FR, IT, UK) and the EU SATCEN have laid down the building blocks of the EU SST. Most recently, Poland, Portugal and Romania became part of the SST Consortium. Building on national SST capabilities, the EU SST Decision defines three actions:

- The establishment of a sensor function consisting of a network of Member States ground-based and/or space-based sensors, including national sensors developed through ESA, to survey and track space objects and to produce a database thereof;
- The establishment and operation of a processing function to process and analyse the SST data at national level to produce SST information and services for transmission to the SST service provision function;
- The setting up of a function to provide SST services of civilian nature to users (assessment of risk of collision, detection of in-orbit fragmentation, assessment of risk of re-entry of objects in the Earth atmosphere).

(1) Decision N°541/2014/EU of the European Parliament and of the Council of 16 April 2014.

In line with the Commission' objective to deliver a Europe that protects and defends its citizens, and in order to ensure a more comprehensive protection of space and ground infrastructure, the 2016 Space Strategy for Europe<sup>(2)</sup> recommended reinforcing the SST Support framework and exploring also a possible evolution towards a European Space Situational Awareness (SSA) system to address other threats and vulnerabilities, such as for instance space weather impacts or cyber-attacks.

## Space Strategy for Europe

Space technologies, data and services have become essential in almost every sector of society. In our everyday life when using mobile phones and car navigation systems, watching satellite TV or withdrawing cash. Satellites provide immediate information when disasters such as earthquakes, forest fires or floods strike, allowing emergency and rescue teams to better coordinate their efforts. In addition, agriculture benefits from improved land use and transportation and energy infrastructure is safer and can be managed more efficiently thanks to satellite technologies. In short, global challenges due to growing populations, increased demand for resources and climate change require information about our planet which space based solution can provide more easily<sup>(3)</sup>.

Space is of strategic importance for Europe as it can support numerous EU policies and key priorities, including the competitiveness of our economy, migration, climate change, the Digital Single Market and sustainable management of natural resources. Besides, it reinforces Europe's role as a strong global player and is an asset for its security and defence.

Building on Article 189 of the Treaty of the European Union, on 26 October 2016 the Commission adopted a new Space strategy for Europe in which a number of concrete actions were identified to achieve four strategic goals:

- Maximising the benefits of space for society and the EU economy by encouraging the uptake of space services and data of the EU flagship programmes Copernicus, EGNOS and Galileo that already serve a number of public policies and sectors;
- Fostering a globally competitive and innovative European space sector by creating the right ecosystem, improving business opportunities and exploiting synergies with non-space sectors;
- Reinforcing Europe's autonomy in accessing and using space in a secure and safe environment by supporting the development of cost-effective, reliable and competitive European launch service, protecting European assets and reinforcing synergies between civil and security space activities;
- Strengthening Europe's role as a global actor and promoting international cooperation with strategic international partners through economic diplomacy initiatives.

In its communication, the Commission expressed its forward-looking vision for the European Space policy of the future.

## Space in the post-2020 period

Thanks to the fruitful collaboration of the European, national and international public and private institutions, Europe has achieved many milestones over the last ten years. To continue with these successes and prepare for a smooth transition for the post-2020 period, in June 2018 the Commission adopted three important proposals where space is explicitly referred:

- The Space Programme<sup>(4)</sup>, to address deployment, evolution and exploitation of space systems and services;
- Horizon Europe<sup>(5)</sup> to address research and innovation needs of the Space Programme and the competitiveness of the sector, and;
- InvestEU<sup>(6)</sup> to stimulate investment in the space sector in support of entrepreneurship, innovation, and sustainable infrastructure.

The Space Programme regulation is a €16 billion package with concrete proposals to ensure that Europe remains a global leader in space. The proposed roadmap for the upcoming year is clear: continuity, evolution and adaptation.

In this perspective, it is mandatory to maintain and, where needed, to upgrade our world-class infrastructures for Copernicus and Galileo/EGNOS.

For Galileo & EGNOS, we therefore propose to invest €9.7 billion to complete the infrastructure, maintain it and prepare the second generation of the system in order to create a true competitive advantage for Europe in developing for instance autonomous and connected cars, Internet of Things and traffic management but also in developing an autonomous strategic asset for our security & defence.

For Copernicus, we propose to invest €5.8 billion. Copernicus is the most advanced Earth observation system in the world. The objective is to maintain EU's autonomous capacity to observe the Earth and to position Copernicus in support to Europe's security and to Europe's leadership to fight climate change.

To make sure that the European space sector adapts to the new realities space is and should be promoted as an enabler of security. For this, the Space Programme proposes to progressively launch two new initiatives, with a budget of €500m:

- A Space Situational Awareness (SSA) system to avoid collision and debris on key satellites, and to monitor the hazards from space such as solar activities or meteorites.
- A Governmental Satellite Communication (GovSatCom) initiative to provide Member States with reliable and se-

(2) COM(2016) 705 final, 26 October 2016.

(3) Space Strategy for Europe COM(2016) 705 final.

(4) COM/2018/447 final – 2018/0236 (COD).

(5) COM(2018) 435 final – 2018/0224 (COD).

(6) COM(2018) 439 final – 2018/0229 (COD).

cure satellite communication to support police, border protection, diplomatic corps or civil protection during crisis.

The Space Programme foresees a number of horizontal activities aimed at ensuring autonomous access to space through the aggregation of EU demand for launchers and support for the adaptation of ground infrastructures. Besides, it supports the promotion of a European “New space” approach as well as accompanying measures for the creation of a homogeneous space ecosystem across Europe where space start-ups and SMEs can flourish. Finally, in addition to a simplified and consolidated Space programme, we are also proposing a slight adjustment of our governance, between the Commission, the Member States, the European Space Agency (ESA) and the GSA in Prague, which will be renamed the EU Agency for Space Programme. While building on the existing framework, the objective is to ensure an even more efficient decision-making and to build on each other respective strengths. ESA will remain the main partner in the implementation of the Space Programme while the Agency in Prague will have a strengthened role especially on security matters.

The Commission proposal for Horizon Europe has an overall budget of €100 billion divided into three pillars. Space is part of Pillar II on Global Challenges and Industrial Competitiveness under the cluster Digital, Industry and Space that has a budget of €15 billion. Research and Innovation needs for the Space programme components Copernicus, EGNSS, Space Situational Awareness, Governmental Satellite Communications will be identified by the Space Programme and addressed under Horizon Europe. These include R&I needs for the mission, system and services evolution of the programme components as well as foster the user uptake of EU space services and data. In ad-

dition, we hope to be able to launch both a public and private partnership focused on large-scale space systems to boost innovation capacity and competitiveness in the global context, and a Knowledge and Innovation Community (KIC) dedicated to space to foster links with research organisations and academia and facilitate the market uptake of our space programme components.

The InvestEU programme brings together the different EU financial instruments and it will build on the success of the Juncker Plan’s European Fund for Strategic Investments (EFSI). It is organised into four policy windows and Space projects are expected to contribute to sustainable infrastructure, Research, Innovation and Digitisation and SMEs policy windows. Space has been identified as an area for financing and investment operations. Through this programme, Space companies can benefit, for example, through the design of appropriate products, thus capitalising on the InnovFin space equity fund pilot (ISEP), a space fund that launched during this Multiannual Financial Framework. This should also facilitate the development of space infrastructure by financing projects as it currently happens in the transport and energy sectors. Or else, by taking advantage from the advisory support so as to develop a bankable pipeline of projects or for capacity building, communication and awareness raising. Another option could come from synergies with the Space Programme and Horizon Europe. In this case, Space companies could benefit from blending mechanisms, thus allowing de-risking investments. In this perspective, InvestEU embraces a smart capital approach for Space in synergy with the Space Programme and the Horizon Europe framework programme in the endeavour to maximise investment opportunities for Space companies.