EU SPACE

FOR CLIMATE CHANGE

Towards a greener, more climate resilient future

#EUSpace

EUSPA
European Union Agency for the Space Programme

The EU Space Programme mitigating impacts of climate change

Climate change has profound impacts on our lives, necessitating urgent and coordinated action at the international level. The EU's climate strategy and Green Deal align with global initiatives like the United Nations' 2030 Agenda, Sustainable Development Goals (SDGs), and the Paris Agreement. These strategies not only mitigate climate change risks but also foster the development of a new Green Economy. The European Union aims to be the world's first climate-neutral continent by 2050.

To achieve this objective, governments, businesses, financial institutions and individuals must make significant efforts towards sustainability. Access to climate data, such as that provided by the EU Space Programme, is crucial for informed decision-making. Galileo, EGNOS, and Copernicus offer vital information for various purposes, including identifying suitable sites for renewable energy infrastructure, optimizing fuel-efficient flight paths, monitoring CO_2 emissions, designing efficient transportation networks and enhancing agricultural yields for sustainable food production.

EU Space plays a pivotal role in supporting climate policies and shaping a greener, more climate-resilient future. By harnessing space-based data, we can make informed choices and facilitate the transition to a sustainable economy. These efforts are essential to mitigate the impacts of climate change and foster a better future for all.

This Copernicus Sentinel-3 image acquired on 25 June 2023 shows the intricate swirls from phytoplankton blooms in the North Sea. Monitoring phytoplankton is critical for understanding the effects of climate change on the oceans.

The EU Green Deal

To achieve its goal of being the world's first carbon neutral continent by 2050, the EU aims to drastically reduce carbon emissions, which can be monitored using space-based technology. More than 50% of crucial climate variables can only be measured from space. Copernicus data plays a vital role in enabling policymakers to enforce regulations and ensure compliance with carbon emission reduction measures.

The Green Transformation

The EU Space Programme can play a critical role in supplying the information companies need to monitor environmental indicators, reduce their environmental impact, become more sustainable and drive the green transformation. EUSPA's EU Space for Green Transformation report presents best practices and detailed examples of how various industries, including energy, road transport, aviation, agriculture, forestry and mining, are leveraging the power of EU Space to drive their sustainability journeys.

UN Sustainable Development Goals

European GNSS and Earth Observation play an important role in achieving the United Nation's Sustainable Development Goals (UN SDGs), including SDGs 11 – Sustainable Cities and Communities and 13 – Climate Action. For instance, urban planners rely on European GNSS to make cities safer, smarter and more sustainable. This includes detecting structural risks and improving services for the 3.5 billion people living in the world's cities.

EU Space in Action

With the goal of making cities better and healthier places to live, the Horizon Europe funded 100KTREES project is not only helping municipalities plant more trees, it's also leveraging Copernicus data to develop mapping and modelling tools to optimise the impact these trees have on air quality, biodiversity, noise abatement, flooding risk and climate change.

Forecasting extreme weather events

Authorities use Copernicus data to monitor and forecast extreme weather events and prepare for the natural disasters that often follow. With climate change set to exaggerate such events, EGNSS and Copernicus will be a key tool that Emergency First Responders use for Search and Rescue and disaster relief and recovery missions.

EU Space in Action

The Horizon Europe funded Overwatch project is using GNSS positioning and Copernicus data, along with such emerging technologies as Artificial Intelligence, drones, 5G connectivity and Augmented Reality, to build an integrated holographic management system for the response, recovery and mitigation of emergencies and disasters. Results are presented via an intuitive, augmented reality-based user interface.

Biodiversity, ecosystems and natural capital

Earth Observation is widely employed to monitor and safeguard land and marine environments, offering a range of products and services for ecosystem protection and biodiversity preservation. It aids in forecasting climate change's effects on vital ecosystems, conducting environmental monitoring, evaluating EU policies, and managing resources. GNSS complements this by providing data to track animals affected by habitat loss, thereby supporting biodiversity and ecosystems.

EU Space in Action: Monitoring biodiversity from space

The EU-funded BirdWatch project is developing a Copernicus-based service to improve farmland's position as an attractive habitat for birds. By monitoring farmland and implementing greening measures, the solution will help protect – even expand – Europe's biodiversity.

Reducing aviation's carbon footprint

European GNSS is playing a crucial role in helping the aviation sector reduce its carbon footprint. Having EGNOS-enabled approaches in all airports gives more choices for alternative airports. It means the distance to be flown could be shorter, resulting in less fuel burned and less emissions released. Furthermore, because EGNOS can help pilots better evaluate visibility conditions, they can avoid circling or diverting – two manoeuvres that burn a lot of fuel.

Urban mobility

Galileo, with its precise positioning and timing data, contributes to the development of smart and sustainable urban transport networks. For example, in European cities, Galileo is utilized in e-bike sharing programs. Barcelona has integrated Galileo-enabled GNSS receivers into 2,600 electric bikes, enabling cyclists to navigate eco-friendly routes and ensuring the bikes are evenly distributed and easily accessible in busy areas.

Cleaning up our oceans

Earth Observation has the potential to help detect and monitor plastic pollution across the oceans. Using data on ocean currents collected by the Copernicus Marine Service, in combination with other information, one can monitor how and where plastics enter the ocean and determine how long they have been there.

Boosting innovation

Through CASSINI Prizes, EUSPA is supporting the development of innovative commercial solutions that leverage the EU Space Programme to detect, monitor and remove plastics, microplastics and other litter from our oceans and waterways.

Resilient infrastructure

Copernicus climate data is essential for modelling the effects of climate change on infrastructure, aiding engineers in assessing resilience and predicting short- and long-term behaviour. It also helps guide investor decisions towards climate adaptation and sustainability strategies.

Promoting sustainable forestry

Forests play a critical role in the fight against climate change, which makes protecting them more important than ever. Earth Observation offers an unprecedented opportunity to monitor forest ecosystems from space and implement best practices in sustainable forestry.

EU Space in Action

The EU-funded SWIFTT project is developing an AI and satellite-based solution for monitoring of forest risks. The project aims to provide forest managers with affordable, simple and effective remote sensing tools backed up by powerful machine learning models. The solution will offer a holistic health monitoring service using Copernicus satellite imagery to detect and map the various risks to which forests and their managers are exposed.

EU Agency for the Space Programme

EUSPA provides safe and secure European satellite navigation services and promotes the commercialisation of Galileo, EGNOS, and Copernicus data and services. It also coordinates GOVSATCOM, the EU's governmental satellite communications programme, and is responsible for the Programme's Space Surveillance and Tracking (SST) Front Desk operations service. By fostering the development of an innovative and competitive space sector and engaging with the entire EU Space community, EUSPA contributes to the European Green Deal and digital transition, the safety and security of the Union and its citizens while reinforcing its autonomy and resilience.

The EU Space Programme

The EU Space Programme, composed of Galileo, EGNOS, Copernicus, GOVSATCOM, Space Situational Awareness and IRIS², is the first integrated space programme created by the European Union to support its space policy, address societal challenges such as climate change and technological innovation, support the EU internal market – and more.

Galileo

Galileo is Europe's Global Navigation Satellite System. It provides accurate, reliable and precise positioning, navigation, timing and safety services. Galileo is designed to provide Europe and European citizens with independence and sovereignty while creating a multitude of services and applications across sectors, ranging from aviation and maritime to agriculture and location-based services.

EGNOS

The European Geostationary Navigation Overlay Service (EGNOS) is Europe's regional satellite-based augmentation system (SBAS) used to improve the performance of global navigation satellite systems like GPS and soon, Galileo. EGNOS uses a set of geostationary satellites and a network of ground stations to increase the accuracy of existing Global Navigation Satellite Systems.

Copernicus

Copernicus is the European Union's Earth Observation programme, looking at our planet and its environment to benefit all European citizens. It offers information services that draw from satellite Earth Observation and in-situ (non-space) data.

IRIS²

The IRIS² Satellite Constellation is the European Union's answer to the pressing challenges of tomorrow, offering enhanced communication capacities to governmental users and businesses while also ensuring high-speed internet broadband to cope with connectivity dead zones.

GOVSATCOM

The EU GOVSATCOM initiative will ensure the long-term availability of reliable, secure and cost-effective governmental satellite communications services for EU and national public authorities managing security critical missions and infrastructures.

Space Situational Awareness

To mitigate collision risks between EU Space satellites and other spacecraft and debris, the EU established a set of capabilities through the Space Situational Awareness (SSA) component of the EU Space Programme. An integral part of SSA is Space Surveillance and Tracking (SST). SST uses a network of ground- and space-based sensors and other infrastructure to survey, track and protect EU Space assets from artificial space objects orbiting Earth (mostly debris from launchers or satellites).

Interested in learning more about EU Space for climate change?

Download the EUSPA EO and GNSS Market Report here:

EUSPA
European Union Agency for the Space Programme

Linking space to user needs

www.euspa.europa.eu

EUSPA

@space4eu

EUSPA