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The greenhouse gas and atmospheric pollutants emission inventory platform demonstrator 'World Emission' is now available

- Led by the European Space Agency and successfully launched by a consortium of industrial partners¹, including GMV as project leader and Capgemini, the platform facilitates and accelerates access to satellite data for scientists and decision-makers.
- Its goal is to enable more accurate understanding of the impact of atmospheric emissions on climate change and air quality, as well as providing a reference on top-down emissions inventories.

Paris, June 22, 2023 - [Capgemini](#) and [GMV](#) announce the availability of the "World Emission" platform demonstrator, funded by the European Space Agency (ESA). Aimed at mapping global greenhouse gas (GHG) and atmospheric pollutant emissions, it leverages data from the [Copernicus satellites](#) as well as satellites from international entities such as NASA or JAXA and brings complementary information to ground base measurements and traditional bottom-up inventories.

GHG and air pollutants emission inventories are used by various stakeholders, including decision-makers, governments, and research organizations, in the battle against climate change and the pursuit of a sustainable world. These inventories enable the assessment of progress made in implementing emission abatement measures and play a crucial role in determining future environmental policies. Current bottom-up inventories use different methodologies from country to country and have large uncertainties resulting from sometimes inaccurate data and emission factors. Satellite observation data complements and enables validation of ground-based measurements by providing high accuracy data that is refreshed more frequently, with better spatial coverage.

Therefore the [European Space Agency started the "World Emission" project in March 2022](#) to create an inventory service based on state-of-the-art satellite observation and inverse modeling. The data processing platform was developed by Capgemini teams in co-construction with some of Europe's most renowned research institutes, including the [Laboratory for Climate and Environmental Sciences](#) in France, the [Max Planck Institute](#) in Germany, the [University of Liege](#) in Belgium, the [Barcelona Supercomputing Center](#) in Spain, and the [Cyprus Institute](#) in Cyprus, and [Kayrros](#), a French start-up specialized in earth observation technology and environmental intelligence.

A powerful data processing tool on a global scale

Since its launch, the project has engaged and brought together a community of users, scientists, and experts, whose role is to evaluate datasets for different atmospheric species and ensure that World Emission provides a precise, reliable, and high-performing inventory service.

The World Emission data platform is online and now accessible through a [portal](#), allowing users to visualize emissions by geographic zones, countries, or emission types and on a specific time scale. In collaboration

¹ Industrial consortium, led by GMV with Capgemini and Kayrros, bringing together European academic and research partners. Within the consortium, Capgemini is responsible for defining the architecture of the service and its operational implementation.

with a network of national reporting agencies, research centers, and municipalities around the world, the consortium is now in the second phase of the project to add advanced features such as:

- Additional greenhouse gas and atmospheric pollutants² emission inventory products at local, regional and global scales into the portal,
- Ability to zoom in on specific areas of the globe,
- Identifying precise emission points such as pipelines, industrial or power production sites, critical gas or oil emission zones,
- Highlighting indicators to distinguish anthropogenic sources, related to human activity, from natural sources of emissions.

The World Emission platform was designed to be user-friendly, integrate with current procedures for reporting polluting emissions, and standardize reporting across all regions of the world.

"Satellite observation data is one of the means to understand climate change, and when used intelligently, it becomes a significant factor in improving solutions to mitigate its impact," said Dr. Carine Saüt, Sustainability Lead for industries at Capgemini in France. *"It is the alliance of the scientific community, institutional stakeholders and industry which has enabled the creation of World Emission, a unique inventory service. Capgemini is proud to bring its deep technological expertise in data and cloud to the World Emission consortium to create cutting-edge tools we need to help advance the fight against climate change."*

Capgemini worked closely with the consortium members and scientific partners to define the platform architecture and orchestrate an operational implementation in the cloud that could integrate algorithm workflows. Data available to each user, wherever they are in the world, needs to be connected to World Emission with the same level of performance, modeling, with a significant improvement in the frequency of updates (once to twice a year).

GMV is the leader of the World Emission project, and it is also acting as its technology integrator. The GMV team is overseeing the general technical coordination of seven organizations. In addition, GMV is responsible for designing the validation plan, which is a key aspect for comparing the satellite data with measurements taken from Earth. For the full project, GMV is also in charge of the communications work package, stakeholder participation, and user requirements. This includes organizing international workshops focused on encouraging the use of what is known top-down emission inventories, by using satellite measurements to complement the traditional bottom-up approach.

"World Emission covers more than 10 different species of gases which are released in the atmosphere at different scales from unique point source to regional or global production. These different datasets are integrated into one single portal, available online for everyone interested in air quality and GHG emissions. This unique way to promote the uptake of satellite-based emission reporting data, at a scale not done before, has been achieved in only one year thanks to the consortium between academia and industry." says Beatriz Revilla-Romero, World Emission Project Manager at GMV. *"At GMV, we are proud to apply our experience and multi-disciplinary background to geospatial solutions. We are bringing our expertise in leading ESA's projects, and on global monitoring services that range from environmental risk assessments to the definition of a climate resilience strategy, or precision agriculture."*

About GMV

Founded in 1984, GMV is a privately-owned technological business group with an international presence. It operates in the following industries: space, aeronautics, security and defense, cybersecurity, intelligent transportation systems, automotive, healthcare, telecommunications, and information technologies for public authorities and large companies.

² The gases inventoried in the second phase of the project will be : Ammonia (NH₃), Sulphur Dioxide (SO₂), Carbon Monoxide (CO), Methanol (CH₃OH), Acetylene (C₂H₂), Ethylene (C₂H₄), Formaldehyde (HCHO), and Isoprene (C₅H₈).

In space, GMV has become the sixth largest industrial group and the first mid cap in the European space sector, with over 1,500 people working in this area. It is the world's leading supplier of control centers for commercial satellite operators, with noteworthy development under way for Hispasat, Hisdesat, Eutelsat, SES, OneWeb, Arabsat and Yahsat. It is also one of the main industrial pillars of strategic European space programs such as Galileo (navigation), Copernicus (Earth observation) and SST/STM (space debris). It contributes significantly to the principal exploration, science, planetary defense, space surveillance and space transportation missions of the European Space Agency (ESA), including participation in Hera, Mars Sample Return, Heracles and ExoMars.

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About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided every day by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of nearly 360,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering, and platforms. The Group reported in 2022 global revenues of €22 billion.

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