



European Interparliamentary Space Conference (EISC) 2023

WORKSHOP PROCEEDINGS

Space-based data to support the green transition

19 – 20 April 2023, Vienna

On April 19-20th, the Austrian Presidency of the European Interparliamentary Space Conference (EISC) hosted the EISC workshop in Vienna, Austria on “space-based data to support the green transition” It brought together EISC delegations from Austria, Belgium, France, Germany, Luxembourg, Norway, and Poland as well as stakeholders from the European Space Agency and the European Space Policy Institute.

The session started with welcoming remarks from the Austrian Presidency’s chairwoman and Member of the Research, Innovation and Digitalization Committee **Mrs. Therese Niss**. She provided insights on the topic chosen by the Austrian presidency as climate change, the green transition, and the development of low carbon economies are the main challenges of today’s time. She explained that the use of space is invaluable in achieving this goal to monitor essential variables such as temperature, vegetation growth, etc. This data is then used by decisionmakers to define policies and strategies on climate issues. Moreover, she underlined the socio-economic value of space-based data in facilitating new scientific discoveries and technological progress, which can generate economic growth and address climate issues. Space enables to track GHG emissions from transportation and industrial sources in order to develop new policies and indicators. Space-based soil moisture and land cover data can support agriculture by minimizing crop loss and maximizing yields. Space-based data can also ensure that natural disaster response is done quickly. She highlighted that it was the role of parliamentarians to create the conditions for the development of the space ecosystem. Space-based data are estimated to have a market value of €2.8 billion, which is expected to increase to €5.5 billion in the next ten years. However, challenges remain to realize the full potential of space-based data. She reminded the audience that from the start of the Copernicus programme until today, about 500 PB of data was downloaded by end-users, which is equivalent to the height of the Eiffel Tower. Mrs. Niss outlined that the benefits of space-based data should not be limited to a few individuals but accessible and easy to understand for all. She concluded that the power of satellite technology could create a more sustainable future while generating economic growth and boosting employment, paving the way for a more sustainable future for all.

Following this introduction, **Ms. Leonore Gewessler**, Minister of Climate Action, Environment, Energy, Mobility, Innovation and Technology, shared a short video message with EISC members. She presented the main objectives of the new Austrian space strategy, which is entitled “People, Climate, and Economy. Space is for everyone”. The strategy focuses on Sustainable development on Earth and in space; Competitive space sector with high added value and sustainable jobs in Austria; Scientific excellence for space and Earth exploration; Space for all areas of life; Talent and diversity for space; Space dialogue with the population. She explained

that Austrian capabilities in space will support the green transition and sustainability goals and underscored the need to use all available assets and develop new ones. She underlined that 50% of Essential Climate Variables (ECVs) depend on space observations. She emphasized that without Copernicus data, we would be blind. She also acknowledged that the space community was aware of the benefits that space systems can provide but underlined the need to increase awareness and expend knowledge to other sectors.

Ms. Henriette Spyra, Head of Department Innovation and Technology at the Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, provided a keynote speech. She highlighted the main goals of the ministry, which are to create and diffuse new ideas on technological innovation, so that it contributes to the green transition by breaking down policy silos in the field of energy, circular economy, space, and digital solution to ensure collaboration within different policy areas. She emphasized that space plays a key role in enabling cities to become climate neutral, provides connectivity and data, which boost innovation, enables growth and job creation, especially in the downstream sector. She outlined that digital driven societies would boost the demand for space services. Furthermore, she highlighted that cooperation in the space sector was essential, taking the example of the JUICE mission, which would not have been financially and technically possible without cooperation. Copernicus and Galileo are powerful tools to monitor the Earth. She stressed that according to a survey, European citizens' priorities in space are to identify and understand climate change; and make life easier on Earth. In addition, UNOOSA and EUSPA's research demonstrated that all Sustainable Development Goals (SDGs) are supported and impacted by space by 1) contributing to the implementation of the SDGs, and by 2) enabling to monitor the achievement of the SDGs, thereby reinforcing the fact that space is needed to implement the green transition. She concluded her speech by acknowledging the need to increase awareness about space to citizens and in other sectors, calling all EISC members to be space ambassadors as they are the stakeholders, who are in contact the most with citizens and companies.

Space-based data to support the green transition: opportunities and challenges for the industry

Following these introductory speeches, the first session of the workshop, moderated by Heather Wokusch, brought together **Mr. Andreas Geisler**, Head of Aeronautics and Space Agency at the Austrian Research Promotion Agency (FFG); **Ms. Eleni Paliouras**, Head of the Strategy, Programme and Coordination Office, Directorate of Earth Observation Programmes at the European Space Agency; **Mr. Maximilian Bauernfeind**, Seconded National Expert, EU Agency for the Space Programme (EUSPA), and **Mr. Christoph Aubrecht**, Programme Coordinator, Global Development Assistance (GDA); Directorate of Earth Observation Programmes,

Ms. Eleni Paliouras provided an overview of the work conducted by ESA in the field of Earth Observation, outlining that ESA and the EU are the main providers of EO data in Europe. She explained that the IPCC warns that current climate action is not enough and that GHG emissions have to be reduced by half by 2030. Space plays a key role in this as in-situ data are often hard to get or unavailable. Satellites enable to monitor climate change more easily and the data used by the IPCC to assess the state of climate change mostly come from space-based data. She underlined that the European Space Agency Climate Change Initiative (CCI) widely contributed to IPCC reports with ECVs and scientific research inputs. However, she explained that today, ESA is trying to provide actionable information derived from EO data, to provide data that can be turned into valuable insights for decisionmakers and companies. She presented

several recent initiatives such as the Space for a Green Future Accelerator, announced in 2021, which aim to develop practical space-based solutions supporting Carbon Neutrality and greening of society by 2050. Within the Accelerator, there are several projects such as the Green Transition Information Factories (GTIF), which is an online portal combining space-based data and data from other sources to provide insights on energy, mobility, and sustainable cities. The first pilot project of the GTIF is on Austria. She outlined that this solution would ensure that national strategies and the EU Green Deal are supported through EO data. In each country, the main priorities for the green transition are different and GTIF is designed to provide tailored data and meet specific needs as there is no one size fits all solution. In addition, within the Accelerator, there is also the Digital Twin Earth, which dynamic digital replica of the planet to mimic the world and create what-if scenarios and includes EO data and data from other sources. She concluded that ESA is committed to engage with all actors to address the green transition by continuing to work with scientists to produce world class EO systems to better understand interactions between natural phenomena and human activity.

Mr. Geisler provided an overview of the space governance in Austrian as well as the priorities and action of FFG. In Austria the innovation system is under the responsibility of three ministries: the Federal Ministry of Education, Science, and Research; the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, which is also responsible for space; and the Federal Ministry for Labour and Economy. He explained that FFG, which is the Austrian Innovation Agency and is responsible for space under the Ministry of Climate Action, has a budget of €1.81 billion. 1% of that budget is dedicated to space, which accounts for €738 million. This budget is distributed to the National Space Programme ASAP, the participation of Austria to ESA, the EU Space Programme, and EUMETSAT, as well as to the European Space Policy Institute and the United Nations Office for Outer Space Affairs. He explained that the National Space Programme contributes to many ESA, EU, and international missions. He also explained that FFG is developing a database of EO Value Chain Austrian Actor as well as the demand readiness level of their services compared to their Technological Readiness Level. He concluded that Austria was becoming more active in space through the publication of R&D projects and results, Hackathons, user uptake studies, GTIF, feasibility projects, innovation laboratories, and participation in ESA business incubation programme and BASS programme.

Mr. Bauernfeind presented the results of a study conducted by EUSPA entitled “EU Space for Green Transformation”, which aimed to understand the Green Deal and the implications for companies, analyse how companies address the green transition, and describe the full potential of EU Space data for the green transition. The Green deal is about making the EU climate neutral and EUSPA’s study is about how the space sector can contribute to that goal. This study was conducted through consultations with private companies such as Alstom, Lamborghini, TotalEnergies, Satelligence, BlueDot, Skytec, Limolane, GlobalEye, etc. He presented some examples of the EU Space Programme contribution to key elements of the green transition and how it can benefit climate policies. For instance, Copernicus provides data on GHG, NOx, Sox, VOC, PM emissions, which can support companies to assess and act on their environmental footprint and help to enforce measures to limit emissions such as the Effort Sharing Regulation or the CO2 Regulation. In addition, the Copernicus Marine Service provides data about ocean waste and EGNOS/Galileo can provide data to improve waste management processes in cities through a better waste disposal fleet operation, etc. He highlighted that the economic benefit of space to downstream companies will generate 132 billion euros over the next couple of years. Additionally, he underlined the benefits space provides to enable location-based micro

mobility. He also highlighted the need for better capabilities of space solutions, taking the example of smart electric scooters, for which a precision of 1 meter is already not enough as a 1 meter different can indicate to the scooter company that the scooter is not in the right place, needs repair or poses threats to public safety and needs to be collected. Finally, he mentioned the critical role of space in enabling smart farming equipment and foster performance-based agriculture and the reduction of pesticide use.

Mr. Aubrecht provided an overview of ESA's Global Development Assistance programme, which started about 15 years ago when ESA started to work with development banks to raise awareness about space. He explained that the work of ESA in support of international development started with the EOworld programme, which was a small-scale demonstration programme for EO services in support of development agencies and development banks' projects. EOworld lasted from 2008 to 2015. Then, ESA established the EO4SD project in 2016 to continue engagement with development stakeholders and build capacity on EO services and enabled to reach a mature acceptance level of space in development banks and agencies. Then, ESA established the Global Development Programme in 2020 to mainstream EO into development operations and financing and ensure skills transfer so that development actors know how to use space but also to ensure that they develop EO services themselves. He further explained that the availability and the accessibility of data are often the main block in using space. However, he acknowledged that in the past ten years, Copernicus has been a game changer in the development of EO Services thanks to the open data policy of the EU, which gives access to Copernicus data to all. He outlined that the GDA has 14 participating states, including Austria. As such, the Austrian Institute of Technology provided data and services on urban sustainability, the Austrian company Geoville provided services on climate resilience, marine environment, and water resources, the Austrian company Hensoldt Analytix provided data on conflict and security, the Austrian company Sistema provided data on resilience. He explained that GDA was planned to run until 2025 but that they already plan to submit a proposal to ESA Member States to continue the work.

After the first session, EISC delegations took the floor to provide statements. Notably, **Poland** highlighted the key role of space in monitoring the climate in Poland, in particular algae and land cover. The Polish delegation also congratulated ESA on the successful launch of the JUICE mission to Jupiter to which Austria contributed as well as Poland. **France**, which held the rotating EISC presidency last year, emphasized that space was essential to the prevention of natural disasters such as forest fires. France also mentioned that the space sector was a highly polluting sector, which is something that must be better analysed and optimized, underlining that the decarbonization of the space sector was also a major issue. **Luxembourg** acknowledged the potential of space systems for monitoring climate change but underlined that it was sometimes difficult to know what was interesting and profitable enough for the private sector. He outlined that we were entering a new era for the financing of the space sector, but acknowledged that it was important to ensure that space can be used for development aid and that not everything should be done for profits. He called for spacefaring nations to use space and develop space for the common good and development aid. **Germany** outlined that space-based data is important in Germany but wanted to put the attention to role of space start-ups in the war in Ukraine, which highly depends on space-based data. In addition, Germany underscored the critical role of space-based data for the green transition, in particular smart farming to have better yield in vineyards in Germany and to generate new opportunities for businesses. The first session ended with Q&A between delegations and guest-speakers, which

focused on data access as part of GTIF and the lack of availability of a European launcher in 2023.

Space downstream applications to support the green transition

The second session of the workshop, moderated by Heather Wokusch, brought together **Ms. Margit Mischkulnig**, Head of Space Affairs at the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, **Mr. Tomas Hrozensky**, Senior Research Fellow at EPSI, **Mr. Sebastian Vogler**, Co-founder and CEO at Beetle ForTech, **Christian Hoffmann**, Founder and Managing Director at Geoville, and Andreas Slaentinig, Founder and CEO at Ubicube.

Ms. Margit Mischkulnig provided an overview of the Austrian space strategy. The first objective of the strategy is to make Austria a pioneer in supporting sustainable development on Earth and in space and is recognised for its commitment at the national, European and international level through the development of sustainability indicators, the establishment of the European Office of Space Commerce, space and sustainability measures, the development of a space diplomacy for space sustainability, and the greening of European and international space law. Her presentation particularly focused on the development of space hackathons to take challenges from a non-space industry, work on solutions with space data, and develop solutions that can fix the problems of other industries. These hackathons enable the winning solution provider to get prizes and contracts and foster the adoption of space services in Austrian companies and institutions. She provided a few examples such as the Space4Mobility Hackathon, which eventually enables ASFINAG, the Austrian high-way company, to monitor green areas around highways and manage the grass cutting of small areas next to highways. She also mentioned the Space4Mobility Hackathon, which led the Austrian railway company OBB to use space to have an overview of the railways and to see whether it is operational and need repair. In addition, the Space4Mobility Hackathon enabled ViaDonau to use space to monitor small water areas and ensure the protection of protected animals instead of using ground measurements. She explained that it was the main work of the Ministry to show the benefits of space and convince industries to use space. Furthermore, she provided additional information on ESA's GTIF project and the Austrian pilot. She showed that the portal can provide data on the number of roofs in Vienna that have already solar panels as well as the roofs where solar panels could be installed, which can demonstrate to decision makers and companies the potential for the adoption of renewable energy as well as to monitor the implementation of policy measures with precise targets. GTIF can also indicate areas where windmill can be installed based on space-based data, and data from local authorities such as the cadaster, etc.

Mr. Tomas Hrozensky showcased insights from 3 research projects conducted by ESPI that have relevance for parliamentarians. He first mentioned that understanding the variety of different observables and indicators that can be tracked through space-born sensing was essential. He mentioned the results of a study conducted in collaboration with the European Patent Office, which looked into patent fillings of space technologies and their potential for green applications. The study showed that the most critical indicators are photosynthetic activity, land use, river and coastal zones, water vapour and cloud, and precipitation. Then, he explained that it was essential to drive the uptake and integration of downstream applications into policy and industrial processes through better capabilities that are simpler to use. He mentioned that ESPI conducted a study with end-users and that they often require new capabilities (e.g., resolution, revisit time) but more importantly simplicity, flexibility, ease of

access and cost-effectiveness. Finally, he mentioned that it was important to address the blocking points to the use of space in policymaking on green and climate issues. He presented the results of a study on the use of space in European climate policies, which demonstrated that policymakers use space in the policymaking process and that they want their policies to be based on science. However, there is a high perception of a disconnect between science and policy and most policymakers consider that they have troubles understanding scientific data as they often have academic backgrounds in the humanities and social sciences rather than engineering and science. Policymakers usually require actionable information and do not use raw data. In addition, the lack of awareness of the availability of space-based data can impact their use in the climate policymaking process. These aspects need to be addressed to increase the use of space by policymakers.

Mr. Sebastian Vogel presented the work of the Austrian startup Beetle For Tech, which focuses on monitoring illegal logging and tracing wooden products origins. He explained that it was policy relevant as the EUTR timber regulation aims to ensure that only legally harvested timber and products made from it are placed on the European market. The EU introduced the EU Regulation on Deforestation free products, which compels companies to provide evidence that they are not destroying or degrading forests. However, there are major differences on the way countries implement risk assessment and monitor control mechanism. He believes that geolocating timber resources will become a fundamental aspect of documentation processes. Beetle for Tech created a software to integrate documentation on timber and developed a GNSS empowered tool to track logs to enable customers to see where their wooden products come from. Mr. Vogel presented some projects such as EO EnForce, which merges satellite monitoring and GNSS tracking for efficient and reliable forest certification verification and the project DEFREE, which aims at developing a digital tool for transparent and reliable information on the products origins and value chains.

Mr. Christian Hoffmann presented the work of the Austrian startup Geoville and its online portal. He showed the level of biomass around Vienna. He explained that there is the obligation in the Common Agricultural Policy to monitor agricultural lands and monitor the subsidies given to farmers. To this end, space can monitor crop types, growing status, building constructions, etc. He underlined that about 2.9 million parcels are monitored per month by Geoville and data are delivered to clients. Geoville also supports the potato industry via the entire value chain to provide data on crop health, soil moisture, crop growth, crop types, etc. In addition, Geoville also monitors irrigation periods at the Syrian-Turkish border to optimize resource use and assist authorities. He also showed how Geoville supported Sao Tome and Principe by providing them with coast erosion data, which enabled to save families from flooding. Finally, Geoville contributes to the GTIF with land surface temperature.

Mr. Andreas Salentinig presented the work of the Austrian startup Ubicube, which aims to make satellite imagery integration mainstream. He explained that satellites are a good resource to digitize our planet and that there are currently more than 1000 EO satellites in orbit, which produce a high amount of data that are not fully exploited especially for SMEs. Therefore, Ubicube developed a B2B Software-as-a-Service product to integrate satellite data into workflows. Ubicube collects data from various satellites and uses this data to put in into their GeoAI framework that are trained to monitor changes to provide actionable insights. The tool can also extract specific objects to monitor changes on the ground. He explained that Ubicube focuses on surface water monitoring. Ubicube combined flood hazard data and flood data from space to estimate flood risks for real estate as well as to monitor buildings to estimate the value of real estate properties. Ubicube can also provide personalized views through a subscription

service to get data on a specific area of interest, which can be used for tracking changes on construction sites.

The second session ended with a statement from the **Polish delegation**, which underlined that Russia was still an associate member of EISC and that it should be removed from the list.

On April 19, workshop participants visited the **Conrad Observatory** in Muggendorf, which is a geophysical observatory including a seismic gravimetric observatory and a geomagnetic observatory. The observatory measures earthquake activities, earth gravity variations, magnetic field variation, and space weather. Members of the observatory also conduct scientific research and publish in academic journals. It was noted that the observatory's systems are able to record all explosions from the War in Ukraine. In addition, the observatory recently hosted secondary sensors instruments that flew on ESA's JUICE mission to Jupiter last week.

Then, workshop participants visited the **Fachhochschule Wiener Neustadt**, which is part of Wiener Neustadt University of Applied Sciences. They presented their CubeSats, which are developed by students for educational purposes.

Finally, workshop participants visited the production lines and offices of **FOTEC** and **ENPULSION**, which develops electric propulsion thrusters' solutions for satellites.