

# Industry view of the future of the Copernicus programme: key issues to address

## Position Paper from the European Earth Observation Services Industry

### Summary:

The present paper details the position of the European Earth Observation (EO) services industry (represented by EARSC) on the evolution of the Copernicus programme. Copernicus is an EU flagship programme designed to provide the public with geospatial information in support of policy-making. EARSC considers that the voice of industry should be incorporated in the governance and uptake of the programme. The main points covered in this paper are the following:

- 1. Support to the Copernicus free, full and open data policy and to complementary actions that would introduce an element of reciprocity vis-à-vis third countries.*
- 2. A clearer boundary between the role of public and private actors in the provision of Copernicus services*
- 3. A more structured dialogue between industry and the Copernicus Entrusted Entities*
- 4. A framework contract model and the possibility of asset federation for the Copernicus Contributing Missions.*
- 5. A greater industrial involvement in the design and testing of new missions, making use of Public-Private Partnership schemes.*
- 6. A better allocation of resources for downstream market development*

## Background

Copernicus is the flagship European Earth Observation programme designed to meet the needs of the public sector for space-derived, timely and accurate geospatial information in support of policy making, while at the same time laying the foundations for various private-sector services and applications. The European Earth Observation services industry has always been a supporter of Copernicus and of the opportunities it presents for technological development and industrial growth. With the approval of the new Space Regulation<sup>1</sup> by the European Parliament in April 2019, space and the related European flagship programmes (Copernicus, Galileo, EGNOS) undertake an even more relevant role in the European political and economic landscape. The European Earth Observation services industry welcomes the Regulation as a critical step forward to strengthening the voice of Europe in space globally, being the first horizontal legislation covering the entire space domain.

This paper, complementing our previous paper from July 2017<sup>2</sup> is presented to draw the attention of policymakers to a number of important implementation issues. The overall objectives supported by EARSC are the following: to reinforce the voice of the European EO services industry, strengthen its participation in Copernicus, and foster the creation of a European industrial strategy for space, adopting a service-led approach.

## The Copernicus Programme

Since its inception in 1998, Copernicus (then called ‘GMES’) has fulfilled the early vision to provide a long-term commitment to “the development of space-based environmental monitoring services, making use of, and further developing, European skills, and technologies” and is now a highly successful example of European co-operation.

After the first legislative approval of the “European Earth Observation Programme (GMES) and its Initial Operations” (GIO) phase (EU Regulation 911/2010), Copernicus became fully operational with the adoption of EU Regulation 377/2014 establishing the Copernicus Programme (2014), followed shortly after by the launch of the first dedicated Sentinel satellites. GMES exists also thanks to the key role the ESA-funded GSE was playing from 2001 onwards which built up a sustainable user community with funding from ESA MS’s putting money on the table in 2005 to fund the first Sentinels. As a result, today, Copernicus is the largest Earth Observation Programme ever implemented worldwide thanks to this co-operation between the EC, ESA and their respective Member States. ESA maintains a central role in research and development for Copernicus, constantly exploring new technological domains such as artificial intelligence, machine learning, deployment and integration of cube-sats: such R&D activities contribute significantly to opening new market opportunities for the European industry.

Whilst Copernicus is first and foremost a public programme serving public information needs, its data and information can be also complemented by commercial and other data sources and be used for commercial business purposes. In today’s age of the digital economy, data have become a key “raw material” to develop new products and services. Consequently, the new Space Regulation states in its explanatory memorandum that the aim of the new horizontal legislative effort is to: “*maximise the socio-economic benefits, including by promoting the widest possible use of the data, information and services provided by the Programme’s components*”. EARSC fully supports this goal and wishes to stress the importance of exploiting the commercial capabilities of the sector to achieve this objective.

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<sup>1</sup> Regulation of the European Parliament and of the Council establishing the space programme of the Union and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013, (EU) No 377/2014 and Decision 541/2014/EU

<sup>2</sup> *Copernicus Evolution: Fostering Growth in the EO Downstream Services Sector, June 2017*. <http://earsc.org/library/>

## The European EO services industry

EARSC, on behalf of the EO services industry, strongly supports the actions which have been taken and recognises the many successes achieved. The industry has been an enthusiastic supporter of Copernicus from the very beginning, recognising the transformation potential it provides for the sector. This led to active participation and significant investment in, pre-operational Research & Development (R&D) programmes devoted to designing and setting up the services with users. In 2018, the European EO services industry had revenues of €1.2 billion, growing at over 10% per annum and supporting more than 8000 highly-skilled jobs<sup>2</sup>.

The market for Earth Observation services in Europe in general is split between B2C and B2G: according to the latest figures for 2018<sup>3</sup>, 51% of the business generated in Europe sees the governmental entities (both European, national and regional/local) as customers for EO services. Additionally, 15% of the revenues come from public co-investment into state-of-the-art R&D. Thus, 65% of the revenues of the sector are generated by serving governmental entities. Government-as-a-customer and government-as-a-sponsor have critical roles to play in the development and growth of the European EO industrial sector. B2B activities, according to the same survey, account for around 28% of the total revenues.

Copernicus holds the key to ensuring European companies are well positioned to exploit the opportunities the global market presents. As new commercial sources of data become increasingly available and new innovative service models and applications are developed, the industrial perspective and the many private-sector initiatives taken must be reflected in the evolution of the programme to enable industry to play a full role.

This paper provides the views of the European EO services industry sector, represented by EARSC, on how the evolution of the programme can deliver further sustainable growth for the European economy. In this context, the following aspects are considered most important to be taken into account for implementation of the programme:

### 1) Free, full and open data policy

#### *a. Support of the industry to the free, full and open data policy*

**The remote sensing industry remains in favour of the Copernicus free, full and open data policy and welcomes the continuing support for it expressed in the new Space Regulation.** The data policy has a significant role as a business enabler at different levels of the value chain. As our recent survey is showing, many companies are being created based on the free and open Sentinel data, where this is fundamental to their business models. From the perspective of the value-adding service providers, the data policy represents an extremely valuable cost advantage for providing innovative and price-competitive monitoring solutions worldwide. From the point of view of Earth Observation data providers, it helps foster the general awareness about the benefits of Earth Observation and causes an increasing demand for additional (commercial) high and very high spatial resolution data. Over the years, the free, full and open data policy has significantly lowered entry barriers for users and customers into the remote sensing market, contributing to shaping the industrial ecosystem.

#### *b. Copernicus as a tool for economic diplomacy*

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<sup>3</sup> See *Survey into the state and Health of the EO services Industry in Europe* published by EARSC, 2019

The Copernicus programme is the biggest provider of Earth Observation data in the world<sup>4</sup>. Institutions can help the European industry strengthen its position also outside Europe by leveraging the free, full and open data policy in the context of partnership agreements or negotiations with third countries. Successful partnerships could ensure access e.g. to specialised national Earth Observation data or in-situ local databases in support of further value-adding applications and export opportunities. **Adding an element of reciprocity to the international uptake endeavours of Copernicus could, therefore, help industry take full advantage of international partnerships.**

European industry plays a pivotal role in exporting technological capacities and contributing to the development of local industrial ecosystems. Under specific agreements with the local authorities, European companies which are willing to invest in value-added services to be sold abroad, could use local in situ databases or other data made available by third countries.

### ***c. Complementary actions***

The addition of a reciprocity element to the policy can help European stakeholders' profit further from the Copernicus free, full and open data policy and unleash the full potential of Copernicus as an EU flagship programme.

The European Commission could identify, after appropriately consulting with industry, a series of strategic countries to organise missions to and encourage trade agreements. The first step to effectively trigger reciprocity agreements would be to make a list of existing, potentially relevant in situ databases in third countries and provide it to industry and other players to consult. A number of these in situ databases are currently not available to industry or are made available with the restriction that the data cannot be used for commercial purposes.

The parallel action of institutional players and private actors is key. The EC can act as a source of information and an official channel of contact with third countries' authorities. With the support from industry, it can negotiate access to databases and the appropriate measures to implement win-win solutions for both Europe and third countries. Such complementary actions will enable the opening of new markets for European industry and the transfer of capacities to local ecosystems so fulfilling industrial as well as political objectives.

## **2) Governance of Copernicus services**

### ***a. Public-private boundary and procurement principles***

A clear definition of Copernicus "core services" is needed for the overall governance mechanism to be effective and to avoid unfair competition. For instance, a clear distinction between those multi-purpose and thematically overarching services provided publicly and procured by the Copernicus Entrusted Entities (EEs), as opposed to more tailored "commercial services" developed and provided by the EO service industry directly.

The European EO service industry would generally like to advocate a greater involvement across the core services supply chain. As a principle, the EEs should outsource to industry the implementation of core services wherever possible. This principle should be applied likewise to any other public procurement activity: whenever the industry has sufficient competencies and resources to carry out a particular service, such activity should be outsourced.

### ***b. Structured dialogue with the Copernicus Entrusted Entities***

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<sup>4</sup> [https://www.esa.int/Our\\_Activities/Observing\\_the\\_Earth/Copernicus/Copernicus\\_20\\_years\\_on](https://www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/Copernicus_20_years_on)

The industry underlines its support to the EEs as essential partners in the procurement process and in the service implementation. The EE's are sectorial expert organisations and pivotal partners to industry for the implementation and uptake of Copernicus services in different markets.

EARSC is looking to establish a structured dialogue with the EE's using EARSC's Copernicus Working Group as a nucleus. The goal of this structured dialogue would be:

- To give the possibility for industry (data providers and value adding sector) to have an official communication channel with the EE's to discuss its requirements and concerns in the domains of service development, evolution and procurement
- To allow the EE's to easily consult with the collective European representation of the EO industry's expertise ahead of important development steps, thus ensuring technical service feasibility and sustainability in a more systematic way, and thus maximising the market commitment and uptake of the Copernicus products and services.

**EARSC suggests creating a platform for a regular and structured dialogue and contact between the Entrusted Entities and industrial players.**

### **3) Third party data, contributing missions and public-private partnerships**

The contribution of third-party data is a key element for the operation and further improvement of the Copernicus services. In order to contribute effectively to the success of the programme, the European industry encourages and supports the coordination effort between ESA and the European Commission to establish a roadmap for the future of Copernicus Contributing Missions (CCM). Involving the CCMs in that coordination process would certainly be beneficial. If CCMs were involved they could provide direct feedback on the feasibility of the contribution expected from them in the future right during the planning process. This would allow for fine-tuning of a roadmap and also enable CCMs to plan ahead of e.g. fundamental changes to the existing EO data access, ordering and delivery mechanisms to be supported, which is currently facilitated via the Coordinated Data Access System (CDS) that serves as interface between CCMs, Copernicus Services and other eligible users of CCM data.

**The industry** advocates for a specific procurement mechanism, which includes a de-centralised element for direct procurement by EU agencies, to accelerate access in critical situations and improve the matching of the data with the user needs. Such procurement mechanisms will support both the institutions and the industry to tackle the challenges that Copernicus will face in the next MFF:

- ensure long term data availability for Copernicus,
- strengthen European capabilities and autonomy,
- improve economical and operational efficiency,

Contractual and financial schemes like Public-Private Partnerships (PPPs) should be investigated as a suitable solution to achieve the public goals of Copernicus while providing the long-term business visibility required by industry to continuously invest in space assets.

The industry has previously<sup>4</sup> called for the use of a public-private approach where the market for services coming from public missions can be tested. **Where data of a certain mission have only public non-commercial relevance, the EO service industry is ready to play a role in production but less in the exploitation. However, where a service may be established addressing commercial markets, the role can be much greater, extending even to investment in follow-on missions.**

Various data providers could also engage in an asset federation initiative, so that Copernicus services benefit from the federated resources. Such a scheme could facilitate the realisation of monitoring services that a single provider may not be able to deliver.

Both PPP's and the possibility to federate assets represent an effective way to stimulate the market and foster the growth of the private sector, while at the same time offering the possibility to improve the public services of Copernicus.

#### 4) Data access

Introduced during the Baveno+20 conference in June 2018, the five Data and Information Access Services (DIAS) have entered their operational phases, acquiring customers and developing their business in a commercial environment.

After the end of the procurement contracts, signed with the European Space Agency by the consortia (in July 2021), the operational continuity of the platforms and established services, customer relations and innovative solutions might be at risk. This is a serious concern for the EO downstream industry: **EARSC considers it crucial for ESA and for the European Commission to ensure that the data access and processing capabilities for the European industry are maintained** until the market matures to preserve and further develop the many established and emergent business models. Long term visibility on the DIAS life-span is necessary in order to attract business commitments from companies. EARSC also considers continued competition among the different DIAS and other commercial cloud providers as an added value for the EO downstream sector and encourages the Commission to take into account its positive effects on the market.

#### 5) Market development and user uptake

According to the new Space Regulation, the market uptake tasks of Copernicus will be entrusted to the new European Agency for the Space Programme (EUASP; formerly the European GNSS Agency or GSA) in Prague. The Agency has gathered significant experience in furthering the market uptake of Galileo services, which is expected to become beneficial also for Copernicus. EARSC is committed to continue and enhance the promotion of the Copernicus programme among user communities both in European and international markets and is looking forward to cooperating closely with the EUASP on the common goal to increase the uptake and generally expand the market for Copernicus data and services. We encourage the Agency to work alongside industry to maximise the results of its efforts. We understand and support, that the programme governance tasks will remain in the hands of the Commission.

Such sustained effort to ensure further enhancement of the Copernicus market uptake is indeed needed to ensure development of a strong internal market for the industry. A strong home-market position is a condition which provides the basis for success in export markets.

To maximise the benefits of the programme for public sector users, private businesses and citizens alike, the budget allocation from the next MFF should reflect the importance of the EO downstream market and its potential for job creation and technological innovation. **Reiterating the position already expressed in our position paper of October 2018<sup>5</sup>, the European EO services industry considers that a target of 30% of the budget should be dedicated to downstream activities** including procurement of data from commercial sources as needed to provide these services.

The industry has always favoured a double role for public authorities (both at European and Member States level): the public sector is a key customer (or anchor tenant) for commercial services as well as supporting state-of-the-art R&D developments in the short term. The industry advocates for the introduction of procurement mechanisms that facilitate different levels of government (from national to local) to purchase services from commercial providers; such mechanisms include pre-commercial procurement and procurement of innovative solutions.

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<sup>5</sup> *Copernicus Evolution: Fostering Growth in the EO Downstream Services Sector, June 2017.* <http://earsc.org/library/>

There is strong potential for Copernicus to support EU policy-making even further by offering improved means for policy implementation and validation. The Joint Research Centre (JRC) has the responsibility to provide scientific support to the EC services for such activities and has the pivotal role of connecting the policy and the technical capability. The centre has the means to identify further policy areas where Copernicus can contribute significantly, and to assess the technological feasibility of potential new services; as has been the case e.g. for the evolution of the EU Agriculture Policy, or is currently the case for Stepping up EU Action to Protect and Restore the World's Forests (COM(2019) 352). This role is complemented by the operational agencies; such as the EEA which has specific responsibilities to advise in the environment-climate change domain.

Once policy needs and related Copernicus service potentials are specified by the European Commission, the implementation, organisation and setup of the operational Copernicus services should become the responsibility of the relevant agencies (EEs) which should also ensure that industrial capabilities can be optimally employed. In this way, the JRC does not risk compromising its indispensable role as the scientific branch of the European Union. Similarly, the EEA, through its cooperation with the Member States in the Eionet network and exemplified through the implementation of the Copernicus Land Monitoring Service, provides a guiding example of finding an effective balance between maximizing the outsourcing to industry and ensuring buy-in from the public sector as a key customer. **The European EO services industry, therefore, calls for the implementation and operational procurement of the services to be managed by the appropriate operational agencies, ensuring that an adequate share of the operations is outsourced to the private sector.**

The competent agencies (EEs) should have, in particular, the thematic expertise to translate the European Commission's initial assessments related to a new service's potential and user base as well as further findings from relevant R&D activities (i.e. Horizon 2020, Horizon Europe and other relevant research programmes) into service specifications, which are making appropriate use of new data and technologies. At the same time, the agencies should have practical experiences in implementing large-scale services for many users in an operationally feasible and sustainable manner.

## 6) Preparing Future Downstream Services

The EC and ESA are currently working to establish a number of new missions to be considered under the Copernicus framework from 2025 onwards. These innovative new missions will, amongst others, measure atmospheric carbon dioxide levels, monitor the Earth's radiation budget in the far-infrared, further operationalise satellite-based hyperspectral imaging and /or provide polar and cryosphere imaging solutions. Many of these topics are directly linked to climate change monitoring. These missions are designed to serve public information needs and provide vital support to policy makers. It is evident that some of these new missions will be also relevant for the private sector.

To explore and prepare these possibilities, the European EO services industry advocates for a new dedicated programme, similar to the one formerly introduced under GMES known as the GMES Service Elements (GSE), to explore the full potential of new services. This new programme should start in a sufficiently timely manner, so as to prepare the appropriate levels of public-private participation in the initial services supply and subsequently in follow-on missions. In this way, the government and industry missions could be aligned to deliver maximum return for European investments.

## Conclusions

EARSC looks forward to engaging with the new Commission and new Parliament to keep fostering the growth of the European geo-information sector. The changes that have been made in the policy structure of the space sector in Europe and the significant budget proposed for the next financial period anticipate

a growing momentum for the whole space sector. EARSC aims at being an increasingly visible and active interlocutor for all the established stakeholders and emerging players in the sector.

### **European Association of Remote Sensing Companies - EARSC:**

EARSC represents the Earth Observation geo-information services sector in Europe with today over 120 members coming from 23 countries covering the full EO services value chain including commercial operators of EO satellites, resellers of data, value-adding companies, geospatial information suppliers, consultancies and system/software providers. The sector plays a key role in providing value-added, geospatial information to its customers in Europe and the world. In 2018, the sector revenue in Europe was over €1.2b giving work to over 8000 highly skilled employees; The sector is dominated by SME's with over 95% of the companies having less than 50 and over 60% less than 10 persons employed.

This paper reflects the views of the full members of EARSC which are commercial companies, coming from Member States in the EU or in ESA, providing services (including consultancy) or supplying equipment in the field of remote sensing or using EO data. EARSC observer members are informed and may have commented on the paper but are not necessarily endorsing its conclusions.