# D2.9 Technology Watch and Future Trends Plan II

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# Executive Summary

This deliverable comprises the second Technology Watch and Future Trends Plan of the PARSEC project, deliverable *D2.4 Technology Watch and Future Trends Plan I* being the first one.

The purpose of the task 2.2 Cross-Sectoral Technology Watch was to coordinate a systematic review of recent development of EO-capabilities and associated enabling technologies in support of major trends and market opportunities in key emerging industries (food, energy, environment).

For this reason, in this task the following activities were included:

1. Compilation of a list of identified technologies to be analysed and monitored about the PARSEC focus industries: Energy, Environment, Food and Earth Observation and associated technologies (such as *e.g.* AI, Machine Learning or Big Data).
2. Provision of overview of emerging technology trends in the PARSEC focus industries based on internal expertise.
3. Continuous update of Technology Watch and future trends analysis through:
   - The monitoring of identified sources by specialist partner on the focus industries
   - Sessions at key industry events during the project: It has been substituted due to COVID-19 situation with the organization of the Technology Talks sessions
   - A web-based open consultation process: It has been implanted through polls in social media

The contents of the results of activities 1 and 2 were included in D2.4. This deliverable includes the activities related to the update of the technology watch and future trends analysis performed since the submission of the D2.4.

In section 1 there is a review of the activities realized for updating the Technology Watch and Future Trends analysis. Section 2 explains the Insights Section in PARSEC website, the wiki style library with articles about technology trends in EO and in the focus industries: Energy, Environment and Food. Finally, section 3 covers the methodology followed for updating contents of the Technology Watch and Future Trends.

# 1 Technology Watch and Future Trends Plan Strategy

PARSEC is involving a broad range of stakeholders, from SMEs to investors and from policy makers to industrial end-users. All these stakeholders are part of an integrated ecosystem which can greatly benefit from Earth Observation (EO) as a key tool for evidence-based decision making.

EO-based services and products provide value across a wide range of application areas in Energy, Environment and Food sectors, including inter alia sustainable agriculture, climate change adaptation, forest management, renewable energy, pipeline monitoring, water quality monitoring.

This value is being increasingly appreciated and sought, owing to the technological developments in remote sensing but also in big data processing.

To identify and prioritise future technology changes and innovations foreseen of potential benefit to SMEs in the cross-border/cross-sectoral ecosystem, PARSEC has:

(i) capitalised on the strong expertise within the consortium: the analysis of monitored technologies based on expertise on the consortium was included in Deliverable D2.4

(ii) exploited the strong links with key stakeholders from the EO sector and the key emerging industries: experts have been interviewed to assess the relevance of identified technologies and to extend the list of relevant technologies.

(iii) systematically collected insights from the greater community. It was planned to attend workshops of major industry events targeted at each of the three emerging industries (food, energy, environment) but due to COVID-19 situation which limited the options to attend such events, PARSEC itself organised three User & Technology Talks in the focus industries: Energy, Environment and Food to facilitate the collection process, involving the (industrial) user side, and to bring more added value to PARSEC beneficiaries.

(iv) a web-based open consultation process: Insight articles produced were accompanied by polls in social media to a) integrate further perspectives, b) spread insights to the greater EO community, and c) promote PARSEC as such.

(v) generated and shared a wiki-style library of these technologies online via the project website, for access to PARSEC beneficiaries and other stakeholders: Insights Section on PARSEC website.

(vi) Organized PARSEC User and Technology Talks in the wiki-style library (Insights): there will be available an overview of challenges and needs of the Energy, Food, and Environment sectors. The content collected during the Technology and User Talks serves as one input to the updated Technology Watch and Future Trends Plan.

# 2 Technology Watch and Future Trends "Wiki" - PARSEC Insights

All the static contents of Technology Watch and Future Trends included in deliverable D2.4 were included in a Wiki style environment hosted in PARSEC Website page and combined with the Market Observatory: Insights section: https://parsec-accelerator.eu/insights/
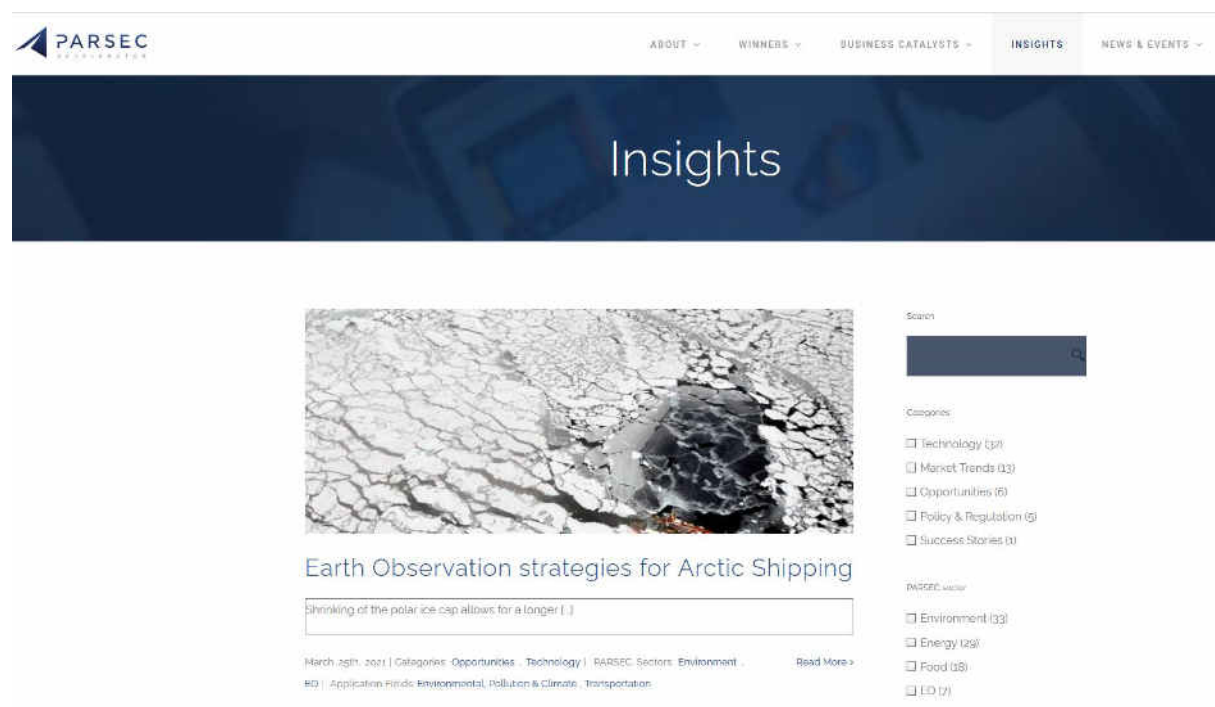


*Figure 1: Wiki-style Technology watch: Insights*

The WordPress implementation allows for categorisation and tagging of content, providing the users with possibilities to search using keywords, via recommended related content, as well as filtering by application fields, content types and PARSEC sectors.

To promote the section of the website, PARSEC promoted the content on the social media, but also an internal webinar was organized for the beneficiaries of the 1st Open Call (#100PARSEC). The webinar was held on 26/05/2020 to explain to the PARSEC beneficiaries the content and purpose of the Insights section.

The PARSEC Insights tool and content have been edited and uploaded only by PARSEC partners.

A webinar was organized o 26/05/2020 to disseminate the contents of the Insights section:

*Figure 2: Insights for cross-border, cross-sectoral innovation webinar held on 26/05/2020*

# 3 Performed actions

The Technology Watch has been an active task from the launch of the Technology Watch and Future Trends Wikipedia.

PARSEC consortium has been working to monitor the Technology trends and needs and to keep the PARSEC ecosystem informed through:
- New content created directly by PARSEC partners
- Social media used to disseminate the content
- Events to connect EO with the three emerging industries (Energy, Environment, Food): PARSEC User and Technology Talks
- Polls on social media to know the opinion of the PARSEC ecosystem about the technologies and changing trends

## 3.1 Creation of the content by PARSEC partners

PARSEC partners have developed new content in the Insights section (Technology Watch and Market Trends Wikipedia) based on their own knowledge, interviews with different stakeholders, and collaboration with external entities.

The objectives of the new content, published after the submission of the deliverable D2.5 PARSEC Technology Watch wiki in M10, are:
- To analyse technology trends and challenges in Energy, Environment and Food Sectors
- To analyse EO applications to the emerging industries
- To connect EO to Energy, Environment and Food Sectors
- To give inspiration to the #100 PARSEC beneficiaries about new ideas of products and services
- To disseminate the possibilities of interactions between the sectors EO, Energy, Environment and Food Sectors

All the published articles can be found in the Insights sections of PARSEC Accelerator website (https://parsec-accelerator.eu/insights/) and are listed following:

1. *Space technology in support of sustainable development*

   "Accurate GNSS-based positioning is essential in mining and quarrying processes, being a key enabler of mine surveying and mapping, machine guidance and control and fleet management applications. On top of these, GNSS is also at the core of the latest innovative trends such as drones and autonomous haulage systems. On the other hand, Earth Observation technologies and Copernicus in particular still have a big potential in raw materials industries, being able to address multiple challenges throughout all mining lifecycle stages, namely exploration, planning and approval, operations and site closure and aftercare. Copernicus and other remote sensing techniques can provide a continuous flow of information for monitoring and management of subsidence, contribute to environmental geologic, biologic, and ecologic data or yield information on socio-economic development and resource availability, useful for site planning, monitoring and rehabilitation. (…)"

Full article available here: https://parsec-accelerator.eu/insight/space-technology-in-support-of-sustainable-development/



*Figure 3: Space technology in support of sustainable development*

## 2. *Earth Observation strategies for Arctic Shipping*

"Shrinking of the polar ice cap allows for a longer and safer navigation season in polar waters. Since the 1970s, the Earth Observation (EO) satellites provide daily pan-Arctic surveys of the sea ice.

EO data is indispensable for the prompt reaction of emergency services in the Arctic. It is a vital tool for obtaining information on ice and weather condition, crucial for the safety of shipping and maritime activities. Hazards such as collisions with icebergs, pressure zones induced by winds and currents can cause loss of ship or crew and widespread pollution by oil spills. These threats can be forecasted and avoided with the EO techniques (…)"

Full article available here: https://parsec-accelerator.eu/insight/earth-observation-strategies-for-arctic-shipping/



*Figure 4: Earth Observation strategies for Arctic Shipping*

3. *IOT in Smart Cities*

"Cities all over the world are entering a new era. The concept of smart cities that encourages the digital transformation of many city sectors, has been gaining popularity globally. A smart city is defined as a city which merges traditional infrastructure with Information and Communication Technologies (ICT) in order to promote innovation and provide useful services with the use of new digital technologies (Batty et al., 2012). Accessibility and use of ICT infrastructures can have a positive impact on urban performance and consequently urban wealth (Caragliu et al., 2011), since they can exploit information from big volumes of real-time data and then use this data to provide solutions in different city sectors (Kim et al., 2017).

Digital technologies constitute the core of a smart city. Technologies, such as the Internet of Things (IoT), can become intelligent assets to smart cities by enabling remote monitoring, managing and control of smart devices. IoT suggests the installation of sensors in smart cities and their connection to the Internet to provide experts the ability to recognize, locate, track and monitor various factors and consequently acquire all the information needed to make right management calls. (…)"

Full article available here: https://parsec-accelerator.eu/insight/iot-in-smart-cities/



*Figure 5: IOT in Smart Cities*

4. ***Earth PARSEC pushes HighSpeed Datacubes on Mundi DIAS***

"Mundi is one of the European DIAS services tasked with providing Sentinel satellite data. The Mundi Marketplace comprises a one-stop shop for Earth Observation services on top of Sentinel data and more. On these data, a value-adding service has been set up using rasdaman to offer Mundi data as datacubes on which "any query, any time, on any dimension" can be answered. PARSEC supports this activity and offers its beneficiaries access through the Big Data Toolbox.

Based on the open datacube standards of OGC, ISO, and INSPIRE Mundi datacubes by rasdaman provide flexible, simplified access and analytics on Mundi Sentinel data. A wide spectrum of clients is supported, ranging from simple map navigation (ex: OpenLayers, Leaflet) over Virtual Globes (ex: NASA WorldWind, Microsoft Cesium) and Web GIS (ex: QGIS) to high-end analytics (ex: python, R). Additionally, the OGC datacube analytics language, Web Coverage Processing Service (WCPS), is directly available; the forthcoming OGC OAPI-Coverages specification will be supported once stable. (...)"

Full article available here: https://parsec-accelerator.eu/insight/parsec-pushes-highspeed-datacubes-on-mundi-dias/
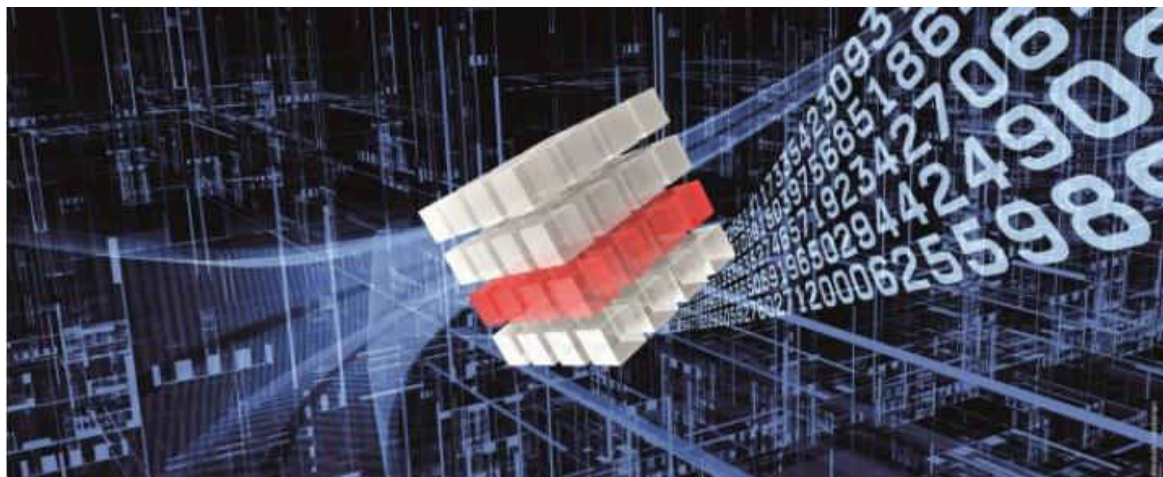


PARSEC pushes HighSpeed Datacubes on Mundi DIAS

With support of PARSEC, Mundi now follows the trend towards [...]

February 25th, 2021 | Categories: Technology | PARSEC Sectors: EO | Application Fields:                    Read More >
Energy & Natural Resources , Industrial , Managed Living Resources , Services

*Figure 6: Earth PARSEC pushes HighSpeed Datacubes on Mundi DIAS*

5. *A new value chain with Parametric insurance*

"Insurance is a millennial practice for transferring or distributing risk, to protect from financial loss. As an Earth Observation (EO) market, Insurance is traditionally a small one, but an emerging approach called parametric insurance recently opens new opportunities for EO service providers. If traditional insurance products indemnify for an actual loss sustained, parametric insurance contracts offer a means to guarantee direct payout after a qualifying event. Parametric contract can protect against unpredictable but potentially devastating risks which can be even impossible to get insured for with a classic approach. Parametric insurance is developing, makes up around 15% of issued catastrophe bonds in a $100 billion market.

Any insurable risk, measurable via data, can be indexed and transferred to the insurance markets, via a parametric contract. By using advanced statistical models, data is processed to provide insights, required to quantify and underwrite these risks. The increase of EO acquisition capabilities, with new constellations, small sats, drones and non EO data (in-situ, social network, mobile…) unlock the possibility to get key parameters for insurance companies e.g. soil moisture, vegetation growth, burnt pixels, wind velocity, rainfall, hail, solar radiation or temperature, to be used for numerous markets. (…)"

Full article available here: https://parsec-accelerator.eu/insight/a-new-value-chain-with-parametric-insurance/



*Figure 7: A new value chain with Parametric insurance*

6. *Robotics for agriculture*

"Information technologies, telecommunication, robotics and in general, autonomous systems are set to transform many global industries. All these technologies currently have, and will have in the future, the greatest impact on large sectors of the economy. One such sector is undeniably the agricultural and food (agri-food) sector which is a dominant and vital component in the global economy.

However, the global food chain is under pressure from factors such as the population growth, climate change, political pressures affecting migration, population drift from rural to urban regions and the demographics of an aging global population. These challenges can be addressed through extending the use of automations in the agri-food sector. Technology and robotics have the potential to transform food production, with the aid of autonomous systems working seamlessly alongside their human co-workers in farms and agri-food industry. (…)"

Full article available here: https://parsec-accelerator.eu/insight/robotics-for-agriculture/



## Robotics for agriculture

Information technologies, telecommunication, robotics and in general, autonomous systems are [...]

February 11th, 2021 | Categories: Policy & Regulation . Technology | PARSEC Sectors:   Read More ›
Environment . EO . Food | Application Fields: Agriculture

*Figure 8: Robotics for agriculture*

7.  *Smart Solar Energy planning and real-time management*

"In 14 and a half seconds, the sun provides as much energy to Earth as its population uses in a day. Capturing all this energy is feasible and depends only on decision making.
Nowadays, there is an increase of the share of renewable energy sources in the total energy production and consumption mix (currently 22%, with the goal to reach 30% globally within the next decade), in conjunction with the overall influence of the climatic conditions from the irrational use of the produced energy. Indicatively, over the past 5 years an estimated 15 gigatonnes equivalent of $CO_2$ emissions was avoided with the use of renewables, a number that is expected to increase to almost 70 gigatonnes for the next 30 years.

The renewable energy market requires an efficient and optimal energy planning and management. The modern technical solutions for the grid operators support monitoring, forecasting, and managing the energy production with the use of space technologies, which are in particular useful in decision-making for the energy producers that exploit photovoltaic or concentrated solar power plants as well as for the electricity transmission and distribution system operators. To this direction, in the framework of the EuroGEO e-shape project. (…)"

Full article available here: https://parsec-accelerator.eu/insight/smart-solar-energy-planning-and-real-time-management/



Smart Solar Energy planning and real-time management

In 14 and a half seconds, the sun provides as […]

February 2nd, 2021 | Categories: Technology | PARSEC Sectors: Energy , EO | Application Fields: Alternative Energy , Energy & Natural Resources    Read More ›

*Figure 9: Smart Solar Energy planning and real-time management*

8. *The innovation potential of synergies between Satellite Navigation and Earth Observation*

"In November 2020, the PARSEC ecosystem welcomed four experts from the European Global Navigation Satellite Systems Agency (GSA) to speak at an informative webinar entitled "The European Satellite Navigation System: services and applications and what's in it for remote sensing". (…)"

Full article available here: https://parsec-accelerator.eu/insight/the-innovation-potential-of-synergies-between-satellite-navigation-and-earth-observation/



*Figure 10: The innovation potential of synergies between Satellite Navigation and Earth Observation*

9. *Foreseeing Wildfires with data*

"Wildfires are a menace that gained much of public attention during recent years' summer seasons. Images of swaths of Australian bush ablaze in January and February 2020 caught public attention as brave firefighters were carrying koala bears from the inferno. The Australian fires were followed by an exceptionally disastrous fire-season in the Western United States. Once again, the images of ordinary folk tragedies and firefighters were nested in the TVs capturing our attention. However, our story begins well before all of that. We start with daily and long-term forecasts and how, with the help of Earth observation data (EO), we can anticipate and better prepare for fires to come.

Wildfires are one of the natural hazards that can touch almost every corner of the globe. The magnitude and the consequences of fires are greatly exacerbated by ongoing shifts in climatic conditions and urban sprawl that puts new settlements in harm's way. Recent fires in Australia and on the West coast of the US are a testimony to that. Over 65% of forests in Europe are considered fire-prone, whereas, in Poland, it is 83% [1]. Prompt response to the danger is of the essence, especially during the summer season. Three main factors contribute to the risk and severity of fire. EO data can provide insights for each one of them: the fuel, the long-term weather patterns, and the day-to-day meteorological conditions. (…)"

Full article available here: https://parsec-accelerator.eu/insight/foreseeing-wildfires-with-data/



## Foreseeing Wildfires with data

Wildfires are a menace that gained much of public attention [...]

December 23rd, 2020 | Categories: Technology | PARSEC Sectors: Environment , EO | Read More >
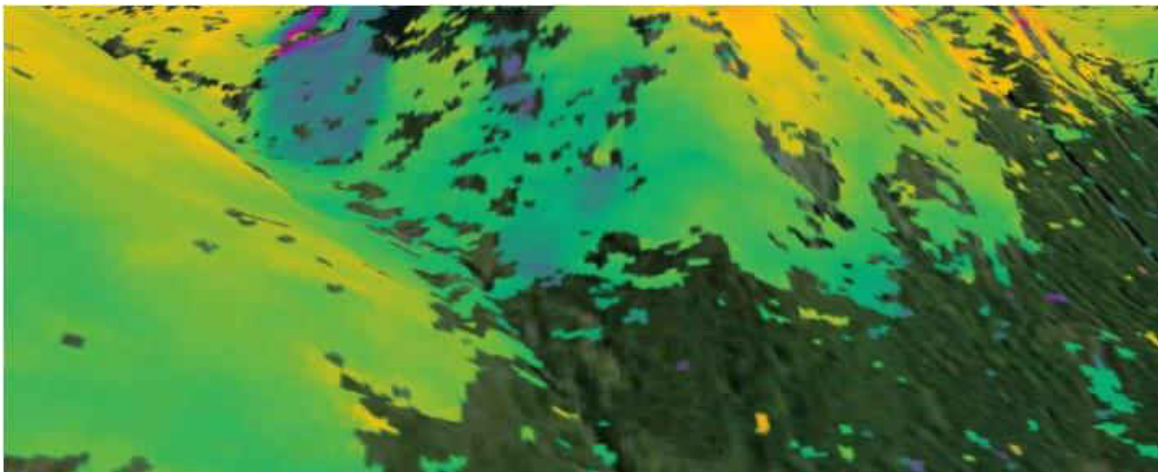Application Fields: Emergency Services , Environmental, Pollution & Climate , Humanitarian
Ops & Health , Insurance and Finance

*Figure 11: Foreseeing Wildfires with data*

**10.** *InSAR Applications – Why industry is learning to "love" radar*

"InSAR is a very well established technology which has proven to be extremely reliable and precise in its application. It is also fast becoming a technology that more and more huge industrial sectors are relying upon to improve their products and services. The extraction of raw materials such as iron ore, coal or crude oil, amongst many others, play extremely important roles in many economies and form a huge global sector in their own right. The raw materials sector is constantly looking for innovative ways to increase their extraction efficiency, minimise their environmental impact and raise their safety standards. Mining companies can benefit greatly from the use of InSAR to monitor ground movement above their operations, allowing them to keep an eye on any potential breaches in safety, keeping both their mines and the general public safe. Forestry and logging companies can also benefit from the use of InSAR to monitor the environmental impact and sustainability of their operations. In fact, raw materials will be a sector of major expansion and a focus for national governments in the future, given its strategic, political and economic importance. (…)"

Full article available here: https://parsec-accelerator.eu/insight/insar-applications-why-industry-is-learning-to-love-radar/



## InSAR Applications – Why industry is learning to "love" radar

When Golden Earring famously sang the lyric "We've got a […]

August 4th, 2020 | Categories: Technology | PARSEC Sectors: EO . Food | Application Fields:    Read More ›
Agriculture . Construction . Forestry . Local and regional planners . Minerals & Mining . Oil and
Gas . Transportation

*Figure 12: InSAR Applications – Why industry is learning to "love" radar*

**11.** *Renewable/compostable materials*

"With consumer concern regarding plastic waste, fashion brands are attempting to reduce their environmental impact by moving to alternative materials. Mainstream fashion and beauty brands work to eliminate consumer packaging altogether in the quest to reduce their impact, and as only 9% of plastics are currently recycled, removing all but the most essential packaging seems the most sustainable approach. Compostable packaging solutions still present sustainability challenges as the infrastructure needed to effectively collect and compost the items at scale is not established in most places in the world.

In some cases where the packaging is directly being erased. It is the case of Lush, where employees use an app using artificial intelligence and product recognition software to scan items to find out more about their products. Others, like in the case of the joint venture Paboco, look for new packaging solutions, partly renewable and fully recyclable. (…)"

Full article available here: https://parsec-accelerator.eu/insight/renewable-compostable-materials/



*Figure 13: Renewable/compostable materials*

12. *Waste valorisation technologies*

"Closing the loop of product lifecycles through greater recycling and re-use or resources can bring benefits for both the environment and the economy. It is the case, for example of recycled nutrients from organic waste or by-products (bio-based materials such as food waste, used water and animal by-products such as manure) that can be returned to the soil as fertilisers, reducing the need for mineral-based fertilisers and creating organic fertilisers for farmers and gardeners. Another case is the waste conversion technology called Thermo-Catalytic Reforming that converts residual biomass into three main products: biochar (containing phosphorus and potassium), hydrogen-rich synthesis gas, and liquid bio-oil that can be refined into high-grade bio-fuels. (…)"

Full article available here: https://parsec-accelerator.eu/insight/waste-valorisation-technologies/



*Figure 14: Waste valorisation technologies*

13. *Data collection and analysis technologies*

"The significant increase in scientific data that occurred in the past decade – such as NASA's archive growth from some hundred Terabytes in 2000 to 32 Petabytes of climate observation data, as well as ECMWF's climate archive of 220 Petabytes– marked a change in the workflow of researchers and programmers. Largely the data responsible for this development is multidimensional arrays (or data cubes), and is foundational in Earth / Life / Space sciences, as well as industrial sectors like agriculture, mineral resource exploitation etc.

The datacube paradigm has proven instrumental in making spatio-temporal Big Data analysis-ready, thereby easing access for experts and non-experts alike. Pioneered by the rasdaman technology, meantime a range of prototypes has emerged. Implementation techniques vary: while rasdaman is a full-stack C++ implementation many tools add an extra layer on top of some existing library, often in python. (…)"

Full article available here: https://parsec-accelerator.eu/insight/data-collection-and-analysis-technologies/
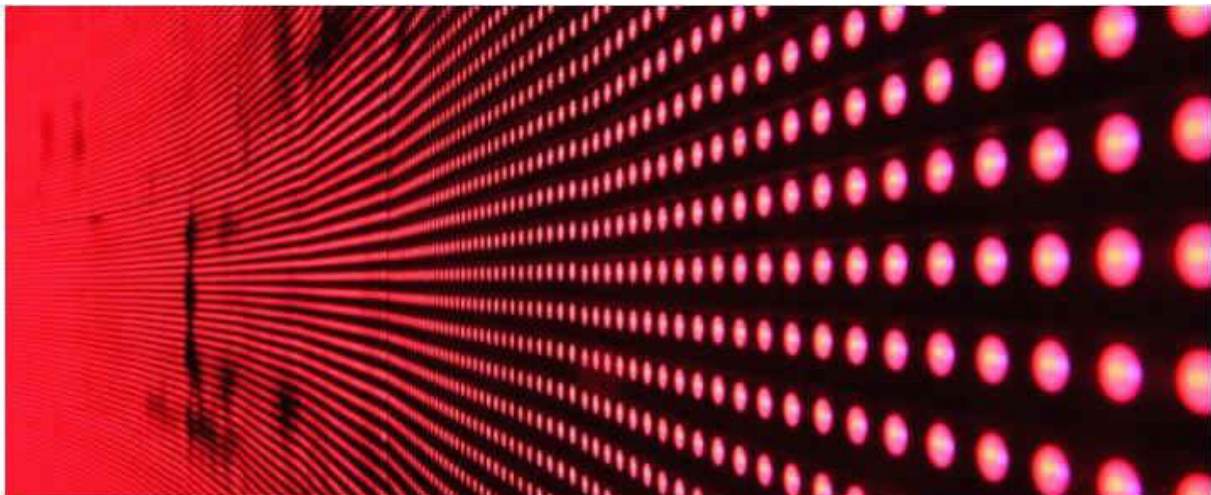


*Figure 15: Data collection and analysis technologies*

14. *Industry digitalization*

"The ever-expanding platform of mobile connectivity, together with the emergence of 5G-enabled cyber-physical systems and advanced cellular IoT, are laying the foundation for the fourth industrial revolution that will transform the existing business structures and provide a basis for disruptive new business. Industry 4.0 arrives in time in a critical moment for climate action. IoT, as an enabling technology, will drive an increase in industrial efficiency and help to better measure the climate impact. Digital technologies are supposed to be capable of accelerating the reduction of global emissions by up to 15% by 2030.

The era of digitalization brings key technologies for achieving an energy-efficient industry. It is the case of wireless IoT with Augmented Reality (AR) and machine learning, allowing an increase in the overall efficiency and quality in manufacturing. Sustainability impact analyses show overall reductions not only in energy consumption but also in transportation-related pollution and the use of natural resources. Better connectivity with 5G will make the onboarding of IoT much easier, making industries more measurable, trackable, and smarter in decision executing. (…)"

Full article available here: https://parsec-accelerator.eu/insight/industry-digitalization/



*Figure 16: Industry digitalization*

**15.** *Emissions measuring technologies*

"The first step in design strategies for adaptation is to collect information. There are multiple methods of data collection, including many types of equipment, from tidal gauges to satellite remote sensors. There are also more ways of analysing and presenting this data using sophisticated computer graphics programs, known as geographic information systems (GIS).

Technological innovation gives ways to solve environmental challenges. An example could be the new approaches to measuring and reducing emissions of methane, which are responsible for a quarter of all the warming the environment is experiencing today. Researchers use a range of technologies, including sensors mounted on drones, airplanes, and even Google Street View cars, to measure emissions of every link in the supply chain. Through reliable, low-cost sensors, remote monitoring, and oilfield internet-of-things, energy companies could reduce their emissions and eliminate waste of saleable gas at the same time. In this sense, companies such as Shell and Equinor are testing continuous monitoring technologies, and others such as Stanford University and ExxonMobil look at mobile detection technologies to be used in aircraft and drones. (…)"

Full article available here: https://parsec-accelerator.eu/insight/emissions-measuring-technologies/



*Figure 17: Emissions measuring technologies*

16. *Less-polluting vehicles*

"It is the case of gas to liquids, for example, switching to alternative fuels. Electric and LPG offer separate fuel systems, but there are other options offering the potential to clean up the existing diesel. One example is the new synthetic gas to liquid (GTL) fuel developed by Shell, derived from natural gas. The use of GTL in heavy-duty vehicles has proved to reduce NOx emissions by 5-37%. Another example is the natural gas converted into dimethyl ether (DME), able to reduce NOx emissions by around 25%. DME is less straightforward to implement than GTL in the sense that it requires some engine modification. In any case, manufacturers such as Ford and Volvo are investigating the potential to bring DME fuelled vehicles into the market.

The use of hydrogen fuel additives can also allow reductions in emissions. For example, CGON developed a technology that fed small amounts of hydrogen into the vehicle air intake such that it creates a more efficient burn, increasing fuel efficiency and reducing emissions. (…)"

Full article available here:  https://parsec-accelerator.eu/insight/less-polluting-vehicles/
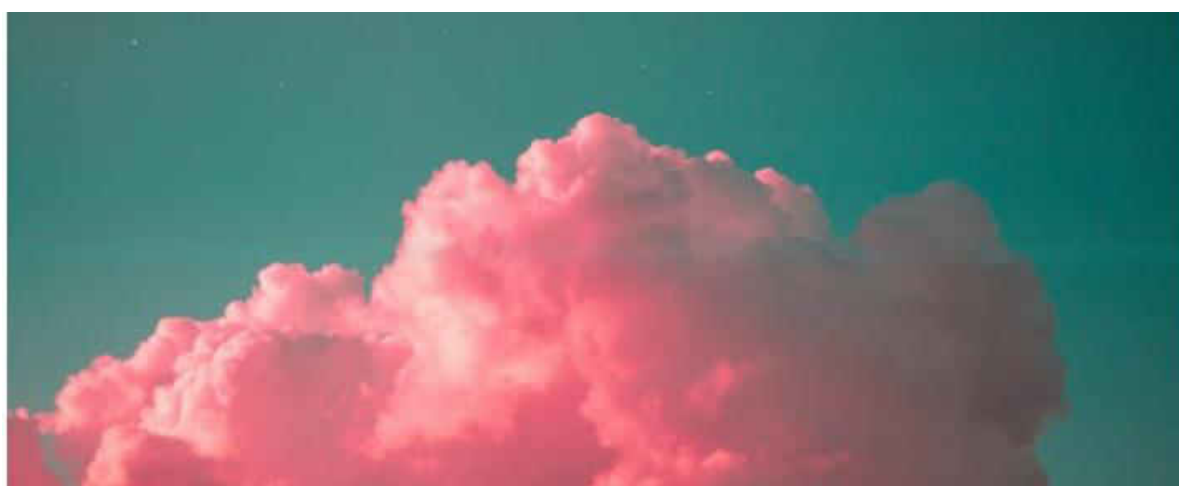


*Figure 18: Less-polluting vehicles*

17. *Air quality monitoring technologies*

"The growth of urban air pollution is one of the most serious indicators of the impact of global urbanization on the environment and human health. The rapid urbanization, with the associated economic and population growth, has led to increases in vehicle use, industrial activity and energy consumption that have raised urban air pollution to critical levels, according to the data from the World Health Organization (WHO).

To fully understand and improved air quality conditions, pollutants must be accurately measured, monitored and managed. Currently, most cities monitor the quality of the air using a collection of large environmental monitoring stations. In this sense, recent advances in sensor and communication technologies have led to smaller, cheaper and more localized monitoring solutions. This use of lower-cost sensor nodes with wireless communication systems is filling the gaps left by legacy environmental monitoring stations. (…)"

Full article available here: https://parsec-accelerator.eu/insight/air-quality-monitoring-technologies/



*Figure 19: Air quality monitoring technologies*

18. *Energy efficiency technologies in municipal facilities*

Traditionally, energy savings has been a driver for building management globally. Gradually, energy benefits are becoming secondary to operational efficiency and non-energy benefits such as occupancy analytics, air quality and worker productivity. In this sense, space utilization is becoming the significant differential metric particularly in the commercial building market. As employees increasingly work from home, facilities-management corporates must come up with ways to address the shrinking workforce and growing oversupply of office space. As a result, data-driven solutions which can optimize the productivity metric have been gaining increasing momentum to address costly underutilized space. (…)"

Full article available here: https://parsec-accelerator.eu/insight/energy-efficiency-technologies-in-municipal-facilities-smart-space-buildings-and-efficiency-in-public-lighting/



*Figure 20: Energy efficiency technologies in municipal facilities*

19. *Technologies for provision of information, training and dissemination to citizen in the field of energy efficiency*

"Citizen engagement is a complementary aspect of smart cities related to the support of greater engagement in an attempt to tap into the collective intelligence of cities as well as better understanding their daily acts and needs.

Currently, a bigger priority in energy efficiency-oriented training and promotion activities is given to the implementation of modern technologies and solutions for new building construction. Across all the countries of the Europe region, the buildings sector accounts for approximately one third of energy consumption, and 40% of $CO_2$ emissions (UNECE 2018). The building sector presents a unique opportunity to improve energy efficiency substantially and, for that, national public policies include a variety of mechanisms which are meant to encourage increasing building energy efficiency, including consumer information programmes. (…)"

Full article available here: https://parsec-accelerator.eu/insight/technologies-for-provision-of-information-training-and-dissemination-to-citizens-in-the-field-of-energy-efficiency/



*Figure 21: Technologies for provision of information, training and dissemination to citizen in the field of energy efficiency*

## 3.2  Dissemination

To be able to evaluate if the created tool – PARSEC Insights – serves its purpose, the PARSEC team was conscientiously following the data from Google Analytics, providing data about the website visitors. The gathered data allowed to track:
- Where the readers come from (*i.e.,* where they accessed the article *e.g.,* through social media post, search engine, *etc.*)
- How much time they spend on the website
- Which article is the most viewed one.

To increase the visibility of the content, but also to engage in discussions with the greater EO community and to include their perspectives, newly published articles were promoted on PARSEC social media. Additionally, based on the statistics of the page, the most popular articles were reshared as they were potentially the most interesting for the PARSEC ecosystem.
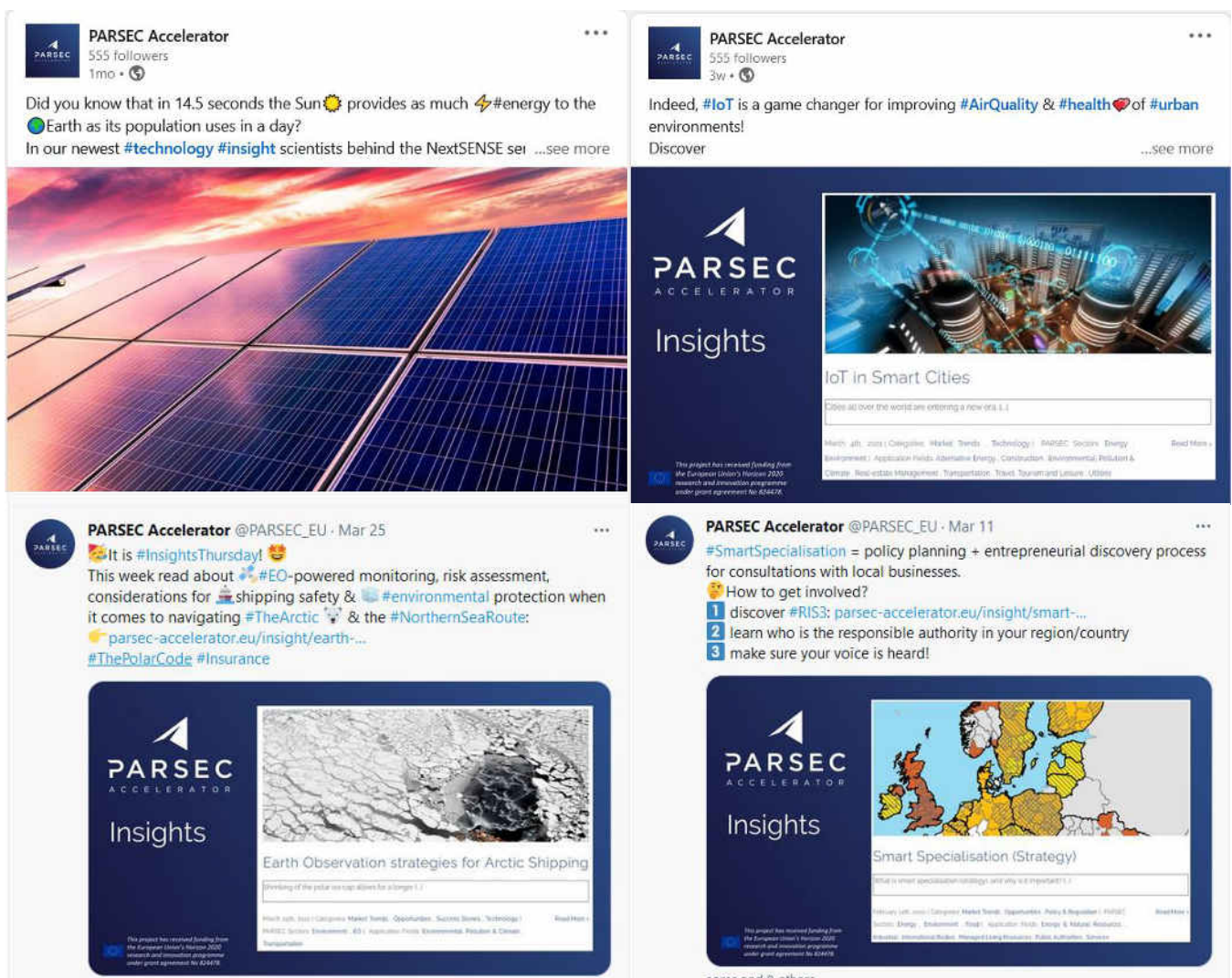


*Figure 22: Promotion of PARSEC Insight articles on social media*

PARSEC community is actively following PARSEC social media accounts, therefore, the promotion contributed to the increased awareness about the website's section. As shown in the Figure 22, looking at the social media as multiplying channels, the analysis shows that social media campaigns and efforts are clearly contributing to increasing the readership of the articles.

Here are some specific examples based on all Social Media statistics:

- Smart Solar Energy Planning – promotional efforts allowed to reach up to 2.783 people, out of which 19 people to directly click to read the article
- While article on IoT in Smart Cities – promotional efforts allowed to reach up to 1.906 people, out of which 18 people to directly click to read the article
- Article on Robotics in Agriculture – promotional efforts allowed to reach up to 1.278 people, out of which 16 people to directly click to read the article
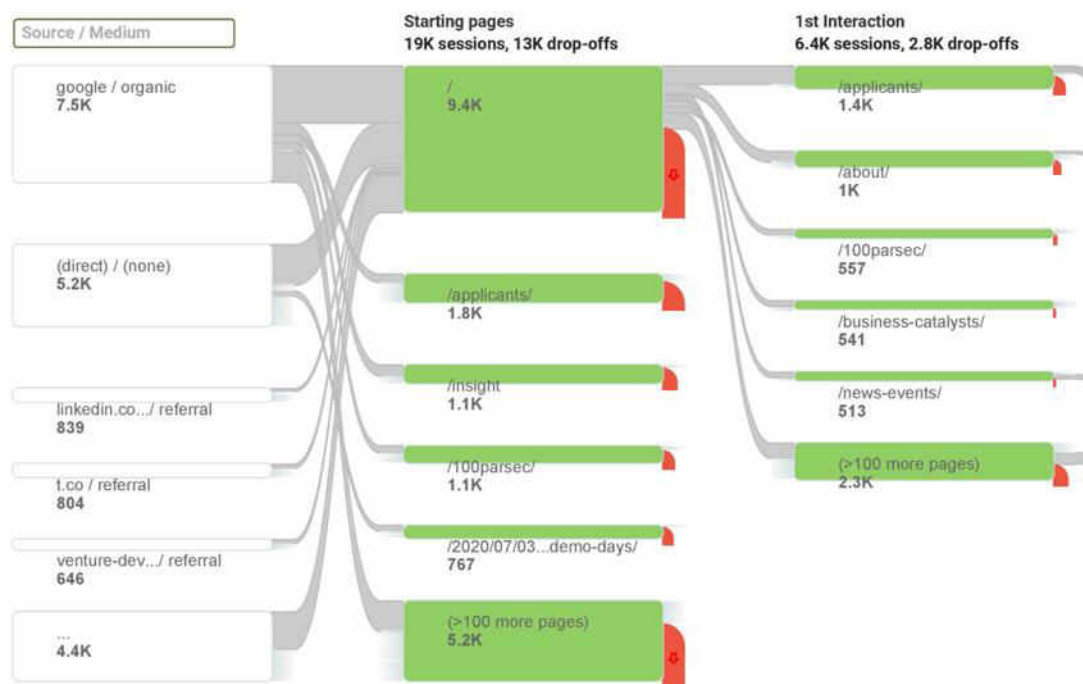


*Figure 23: User Flow chart for PARSEC website (period 01.02.2020-27.04.2021) as generated by Google Analytics, © Google 2021*

What is an interesting input for the Technology and Market Trends Observatory, is that so many of the Insights articles were found organically, meaning, internauts found them while searching for the topics in a browser. That clearly shows that the selected topics are of high interest to a broader community of entrepreneurs, innovators and researchers.

Based on these encouraging numbers, and the effectiveness of the social media campaigns, PARSEC Team decided to conduct the web-based open consultation process also on its social media accounts (more on that in section 3.4).

# 3.3  PARSEC User and Technology Talks

The PARSEC consortium has organized three webinars targeting the PARSEC sectors, Energy, Environment and Food, with the following main objectives:
- Analyse with stakeholders from the sector the technology trends and their challenges
- Promote the EO-based solutions and their potential
- Connect EO with the focus sectors
- Connect #15PARSEC with potential customers
- Disseminate the solutions of #15 PARSEC

These webinars have been called PARSEC User and Technology Talks as they focus on the discussion and exchange between the potential user and the EO provider. For each session, PARSEC Team invited representatives of one sector (Food, Energy, Environment) who are potential users of EO-based solutions. The discussion panel was also joined by an EO expert giving the overview of the status of the use of space technologies in the field.

The webinars were organized using Zoom Webinars and were open to broader PARSEC Community, including members of AVAESEN, EARSC, beneficiaries of the 1st Open Call (#100PARSEC), and the current beneficiaries (#15PARSEC). #15PARSEC were in a privileged position, as they could join the discussion panel and promote their solutions.

All the sessions were recorded and are available on PARSEC YouTube channel, accordingly:
> PARSEC User and Technology Talk: ENERGY
> PARSEC User and Technology Talk: ENVIRONMENT
> PARSEC User and Technology Talk: FOOD

The webinars served numerous purposes like creating links between the EO and other sectors, introducing #15PARSEC to the potential users, increasing their visibility, but most importantly, letting them get to know their user better. The discussions provided a great overview of technological needs and challenges in the targeted sectors. The overview of the conclusions of the sessions will be available on the PARSEC website after the submission of this deliverable.

## 3.3.1  Users and Technology Talk: ENERGY

The first webinar of the series took place on 10/02/2021 with the following agenda:

10:00 Introduction of the project and the session, Weronika Borejko, EARSC
10:10 Debate about the visión of the future and technology trends on the Energy Sector
- Moderator: Salomé Reíllo, AVAESEN
- Eugenio Domínguez, CEO HESSTEC
- Jonas Rechrecehe, Open Innovation EDF Península Ibérica
- Ignacio Osorio, CEO Ampere Energy
11:50 EO Expertise: Dr. Panagiotis Kosmopoulos, EuroGEO e-shape Project
11:05 Debate about application of EO in the Energy Sector
11:15 PARSEC consortia presentations
11:45 Q&A

*Figure 24: User & Technology Talks: Energy*



*Figure 25: User & Technology Talks: Energy - Speakers*

The experts of the Energy Sector participating as speakers were:

- Eugenio Domínguez, CEO HESSTEC
  Hybrid Energy Storage Solutions Ltd. (HESStec) is a technological solution provider, pioneer in creating hybrid energy storage solutions (HESS), optimized in economic terms, thanks to the integration of several energy storage technologies, enhanced power electronics and patented energy management algorithms in exclusive, flexible hardware and software platforms.
- Jonas Rechrecehe, Open Innovation EDF Península Ibérica
  Électricité de France is a French multinational electricity generation and distribution company. It is the leading producer and distributor of electricity in France and Europe. EDF is the second largest electricity producer in the world after China Energy Investment in terms of power.
- Ignacio Osorio, CEO Ampere Energy
  AMPERE Energy provides batteries that use energy more efficiently. They are working to promote a new energy model that is cheaper, more sustainable, more environmentally friendly and consumer-led, because they believe that the future of energy depends on how intelligently we use it.

As the EO expert, Dr. Panagiotis Kosmopoulos from the Nationale Observatory of Athens joine the session. He was also representing e-shape project promoting the use of the Earth Observation in several key sectors, including the energy sector.

From the #15PARSEC, two representatives pitched their solutions:
- Village Data Analytics, Nabin Galibre
- Rom(EO) , Carlos Matilla

The pitches were followed by questions and comments from the experts, but also the audience were invited to interact with the presenters. In total more than sixty (60) people registered for the event.

The discussion panel identified important trends in the sector which will shape the future of the energy, and these are following:
- Internet of Energy
- Higher penetration of renewable energies
- Electric vehicle deployment
- Tools to manage the grids in a different way
- Revolution in the sector now
- Digitalization
- Smart sharing of information
- Energy Sector is blending

As the main challenges the experts identified the following ones:
- Moving from centralised energy to decentralised one,
- Need of cheap storage,
- Going into hydrogen and renewable gases;
- Recycling of turbines, solar panels, batteries
- Adaptation to the higher electricity demand
- Energy efficiency
- Shelf consumption
- Lack of information and incentives for the final customer

- Need for analysis tools for data
- Shelf consumption
- Lack of information and incentives for the final customer
- Analysis tools for data

## 3.3.2    Users and Technology Talks Environment

The webinar took place on 10/03/2021 with the following agenda:

10:00 Introduction of the project and the session, Weronika Borejko, EARSC
10:20 Moderated discussion on needs and challenges of the environment sector
- Moderator: Giannis Nasiopoulos & Panagiota Syropoulou, DRAXIS
- Elsa Durieux, ICLEI
- Carlos Rivero, Consultoria3Cero
- Andrea Castellar, Discomon
- Eduardo Rosado, Grupo Tecopy
10:55 EO potential on the environment sector, Dr. Ulf Mallast, Department Monitoring and Exploration Technologies UFZ
11:05 PARSEC consortia presentations
11:30 Moderated discussion on the use of EO in the sector and its development potential
11:45 Q&A



*Figure 26: User & Technology Talks: Environment*

*Figure 27: User & Technology Talks: Environment - Speakers*

The experts of the Environment sector participating as speakers were:

- Elsa Durieux, Senior Offices Sustainable Finance, Smart Cities and Business at ICLEI
  ICLEI – Local Governments for Sustainability is a global network of more than 2500 local and regional governments committed to sustainable urban development. Active in 125+ countries, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development.
- Andrea Castellar, Project Manager in Environmental IoT Solutions Discomon
  Discomon is a Spanish technology and environment company
- Eduardo Sánchez, Director Proyectos COTESA
  COTESA is a company specialized in solutions and services for the optimization of business processes and territorial management through information technologies associated with the position.
- Carlos Rivero, Consultant Consultoria3Cero
  Consultoria3Cero professional advice in the areas of Industry and Environment

The EO expert was Dr. Ulf Mallast, Department Monitoring and Exploration Technologies UFZ, being also a showcase leader in the e-shape project, targeting Ecosystem.

As the environment sector is numerously represented among the #15PARSEC, the total of five (5) teams pitches their solution:
- Healthy Places, Robert Heinecke
- Dipteron, Ana Crisitina Galhego
- Polaris, Vincent Brenier
- SkysrApp, Antonio Jara
- Space4Fauna, Dragana Vukasinovic,.

The session attracted more than eighty (80) registrants, as the environment and the innovations in the sector are a highly interesting topic currently, especially taking under consideration the new initiatives, like Green Deal. The popularity of the subject is also confirmed by the high number of

views of the recording on the YouTube channel – seventy-two (72). Additionally, the recording was viewed one hundred and sixty-three (163) times.

The discussion was mainly focusing on the following issues:

- Climate change adaptation
- Green energy transition
- Pollution elimination
- Circular economy boost
- Sustainable agriculture
- Clean & healthier forms of transport
- Biodiversity conservation

A more detailed discussion was difficult, as the environment sector as such covers diverse topics, and therefore, involves different technologies and solutions. Nevertheless, there is a strong demand for the innovative solutions and game-changing ideas, therefore, there is a lot of space for the new EO-based solutions.

### 3.3.3    Users and Technology Talks Food

The last webinar of the series, dedicated to Food sector, took place on 17/03/2021 with the following agenda:

10:00 Introduction of the project and the session, Weronika Borejko, EARSC
10:20 Moderated discussion about key drivers and challenges for the demand side (Food Sector)
- Moderator: Lefteris Mamais, EVENFLOW
- Enrique Moltó, IVIA
- Mark Hall, Syngenta/Crop Life Europe
- Gedas Vaitkus, Geomatrix
10:55 Presentation on how EO can respond to these drivers and challenges today and in the future, Laurent Tits, VITO
11:05 PARSEC consortia presentations
11:30 Moderated discussion on the use of EO in the sector and its development potential
11:45 Q&A



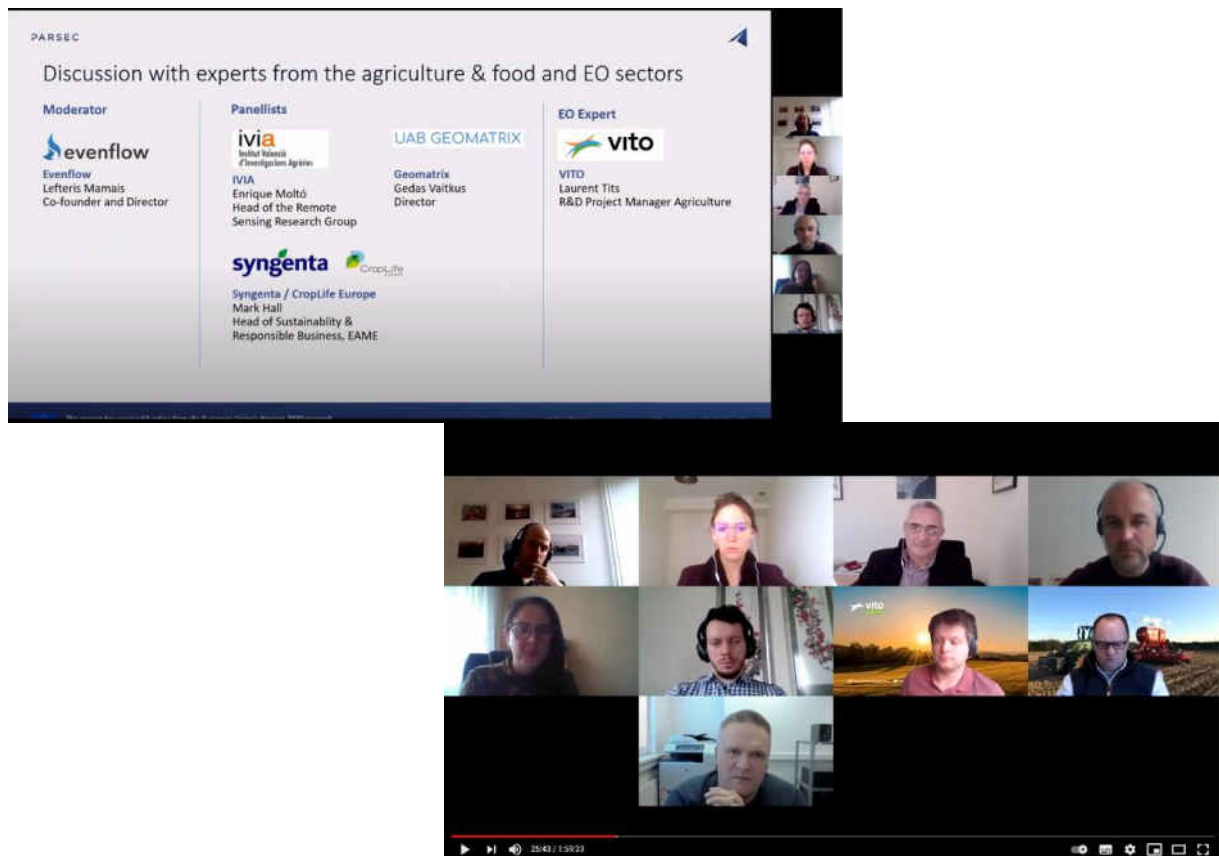*Figure 28: User & Technology Talks: Food*

*Figure 29: User & Technology Talks: Food - Speakers*

The experts of the Food sector participating as speakers were:

- Enrique Moltó, Head of the Remote Sensing Research Group IVIA
  IVIA, the Valencian Institute of Agrarian Research is an autonomous entity of the Generalitat (Valencian Regional Government). Is in charge of the aims of the Generalitat Valenciana of promoting scientific research and technological development in the Valencian agri-food sector and of integrating this contribution to the progress of agrarian science in the system of collaboration and cooperation relationships typical of the research activity.

- Gedas Vaitkus, Director UAB Geomatrix
  Geomatrix is a SME founded in 2011 by GMES/Copernicus expert Dr Gediminas Vaitkus. The company focuses on applied research in remote sensing and geo-informatics, development of innovative technological solutions and extreme geo-computing services.

- Mark Hall, Head of Sustainability & Responsilbe Business Syngenta, CropLife Europe
  Syngenta Group is a Swiss multinational biotechnology company manufacturer of chemical products for agriculture, and currently the largest agrochemical business group in the world.

The EO expert was Laurent Tits, R&D Project Manager Agriculture VITO, representing e-shape project, as the leader of the Agriculture showcase..

The food sector is also numerously represented among the #15PARSEC, hence, the following three teams were pitching at the session:

- Space4Fauna, Dragana Vukasinovic

- Polaris, Cooper Van Vranken
- Automated Cottonsurance, Osman Baytaroglu

The webinar had to be postponed due to the unavailability of our main speakers, the change of the date might have impacted the show-up rate. Nevertheless, forty (40) people registered in advance for the session, and forty-one (41) in total attended the session. Additionally, the recording was viewed thirty-eight (38) times.

The discussion was mainly in the following issues:

- Key drivers and challenges at the agricultural demand side, including policy, market developments, technological developments and trends, and main sectorial challenges
- Crop protection aspects
- Agricultural research, including e.g. primary food production, plant protection, irrigation, harvest, agricultural engineering etc.
- Common Agricultural Policy from the perspective of "actors in the field", i.e. at farm level
- Implications from other (sets of) policies such as Green Deal, Form to Fork
- Technology-enabled quantification of ecological aspects
- Biodiversity aspects

# 3.3.4     Users and Technology Talks dissemination on social media

As explained in section 3.2 Dissemination, the activity on social media highly impacts the visibility of the project and its efforts. Therefore, PARSEC Accelerator social media accounts also promoted the PARSEC User and Technology Talks recordings, inviting those who did not attend the sessions to watch the webinar. As for all the publications and posts done by official PARSEC accounts, all PARSEC partners reshared the content. The recording will be further promoted on publication of the summary notes for all the sessions.
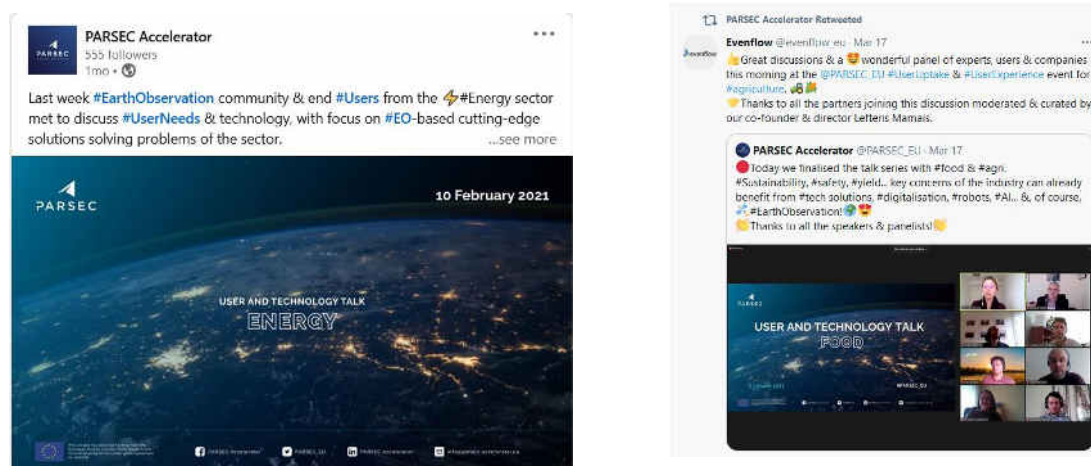


*Figure 30: User & Technology Talks: Dissemination on social media*

## 3.4 Web-based open consultation process

The objective of the planned web-based open consultation process was to investigate the technology needs and challenges of a broader PARSEC ecosystem. The use of the social media for conducting the consultation guaranteed a big outreach to users representing various sectors. The consultation was composed of three main elements:

1. **Polls during webinars**

Additionally, to gather more feedback, some queries, short polls, have been launched to the #100PARSEC directly, asking them to evaluate the Insights content, mostly in different sessions organized during the project.

2. **PARSEC User and Technology Talks**

The series of webinars also contributed to the open consultation process, as the PARSEC ecosystem participated in the discussions, and was answering the main questions regarding the technology needs and challenges.

3. **Social media polls**

Finally, online polls were published on PARSEC social media accounts (Facebook, Twitter, LinkedIn), before the publication of the upcoming Insight articles. The questions were related to the article's topic, to spark the community's interest. The polls were aiming at:
- Identifying technological needs and challenges in the PARSEC ecosystem
- Promoting the edge-cutting solutions
- Getting to know the community better
- Promoting the project and the Insight section

The information of the polls is summarized in this table:

| Date | Poll text | Article | Statistics |
|---|---|---|---|
| 28/01/2021 Duration: 3 days <br><br> Statistics on 10/02/2021 | Can Earth Observation help in optimizing the solar energy supply and demand? <br> 1) Yes, of course <br> 2) Yes, but I don't know how <br> 3) No <br> 4) Don't know <br><br> Tw, LinkedIn, FB | Smart Solar Energy planning and real-time management (link) <br> Article published & promoted on 02/02: <br> Tw, Ln, FB | Impressions/reach: 2356 <br><br> Engagements (clicks, reactions, shares): 48 <br><br> Answers: 17 <br><br> Main answer: "Yes, of course" (13/17) but also "Yes, but I don't know how" (4/17) |
| 03/02/2021 Duration: 1 day <br><br> Statistics on 10/02/2021 | Which energy stakeholders can use Earth Observation? <br> 1) PPV <br> 2) Self-consuming <br> 3) Policy makers <br><br> Twitter, Facebook, LinkedIn | Smart Solar Energy planning and real-time management Article already published and promoted | Impressions/reach: 1743 <br><br> Engagements (clicks, reactions, shares): 51 <br><br> Answers: 9 <br><br> Main answer: "PPV" (4/9), but also "Policy makers" (3/9) and Self-consuming (2/9) |

| | | | |
|---|---|---|---|
| 10/02/2021 Duration: 1 day<br><br>Statistics on 17/02/2021 | #Tech and #robotics have the potential to transform food production and enable #agricultural sector to address many of its challenges.<br>Which of the following is the biggest obstacle for agricultural robotics?<br><br>A) Technology isn't ready<br>B) The sector is too<br>**C) Farmers lack the know-how**<br><br>Twitter, Facebook, LinkedIn<br><br>*Which one is the biggest obstacle ahead, for agricultural robotics (answer C)*<br>*A) Technology isn't quite ready yet*<br>*B) The agricultural and food sector is highly fragmented and diverse*<br>*C) Farmers' lack of skills, knowledge and business models to adopt and apply robotics* | Robotics for agriculture (link) Published 11/02:<br>Tw, Ln, FB (12/02 for FB) | Impressions/reach: 2063<br><br>Engagements (clicks, reactions, shares): 65<br><br>Answers: 22<br><br>Main answer: "Farmers lack the knowh-how" (13/22), but also "The sector is too diverse" (8/22) and "The technology isn't ready" (1/22) |
| 17/02/2021 Duration: 1 day<br><br>Statistics on 24/02/2021 | How can 🛰️🌍#EarthObservation data help protecting businesses from great losses due to damages caused by 🔺natural disasters or 🌪️adverse weather? Via an insurance product!<br>Our poll question of the day:<br><br>❓Do you consider insurance market as a<br>• Busines partner<br>• Customer<br>• Too complex<br>• Not relevant<br><br>Twitter, Facebook, LinkedIn | A new value chain with parametric insurance (link) Published 18/02:<br>Tw, Ln, FB | Impressions/reach: 2201<br><br>Engagements (clicks, reactions, shares): 48<br><br>Answers: 17<br><br>Main answers: "Customer" (7/17), & "Business partner" (7/17), a few "too complex" (2/17), "Not relevant" (1/17) |
| 24/02/2021 Duration: 1 day<br><br>Statistics on 03/03/2021 | ❓What do you think?<br>😕How will #EarthObservation 🌍cope with processing ever-growing 📈amounts of data?<br>😲<br>#BigData #EO #Satellitedata #Processing #ComputerScience<br>- HPC (high perf computing)<br>- Edge computing<br>- Datacubes<br>- Combining all the above | PARSEC pushes HighSpeed Datacubes on Mundi DIAS (link) Published 25/02:<br>Tw, Ln, FB | Impressions/reach: 2165<br><br>Engagements (clicks, reactions, shares): 41<br><br>Answers: 14<br><br>Main answer: "Combining all the above" (9/14), a few "Edge computing" (3/14) &"HPC (high perf computing" (2/14) |

| | Twitter, LinkedIn | | |
|---|---|---|---|
| 03/03/2021 Duration: 1 day<br><br>Statistics on 10/03/2021 | 🏙What makes #SmartCities actually smart? 😎<br>This week's #tech subject is #InternetOfThings in cities.<br>❓ Which of these is a major issue that can be addressed through the application of #IoT devices?<br>    a)   Waste management<br>    b)   Air quality & our health<br>    c)   Water management<br><br>Correct answer: B<br><br>Twitter, Facebook, LinkedIn | IoT & Smart Cities (link) Published 04/03:<br>Tw, Ln, FB | Impressions/reach: 2724<br><br>Engagements (clicks, reactions, shares): 46<br><br>Answers: 14<br><br>Main answer: "Air quality & our health" (11/14), a few "Waste management" (2/14) & "Water management" (1/14) |
| 10/03/2021 Duration: 1 day<br><br>Statistics on 16/03/2021 (one day earlier as usual) | 👨‍💼👩‍💼 #SMEs & #entrepreneurs, this week we'd like to discuss #innovation & specifically the ⚡<br>power of local support for it.<br>😊 Do you know how Smart Specialisation Strategy can help your business❓<br>#S3 #RIS3 #research #business #smartspecialisation #entrepreneurship #RRI #recovery<br><br>-    Yes, I have a vague idea<br>-    Yes, I've been involved<br>-    Not sure how it works<br>-    Not sure how it can help<br><br>LinkedIn, Twitter | Smart Specialisation (link) **Promoted** 11/03:<br>Tw, Ln, FB | Impressions/reach: 1877<br><br>Engagements (clicks, reactions, shares): 31<br><br>Answers: 12<br><br>Main answer: "Not sure how it works" (6/12), "Yes, I've been involved" (3/12), a few "No, Not sure how it can help" (2/12) & "Yes, I have a vague idea" (1/12) |
| 16/03/2021 Duration: 3 days & 7 days (LinkedIn)<br><br>Statistics on 24/03/2021 | This week, let's talk 🚢 #ships, #navigation, 🌍Earth Observation 🛰 and, as always, #business & #tech trends!<br>😕 What do you think?<br><br>How does Earth Observation guide ships and the whole shipping industry in the Arctic? It enables…<br>-    Business development<br>-    Ship navigation planning<br>-    Insurance risk estimation<br>-    All of the above<br><br>LinkedIn, Twitter | Ships in the Arctic NOT PUBLISHED THIS WEEK | Impressions/reach: 2214<br><br>Engagements (clicks, reactions, shares): 46<br><br>Answers: 22<br><br>Main answer: "All of the above" (8/22), "Ship navigation planning" (7/22), a few "Business development" (4/22) & "Insurance risk estimation" (3/22) |
| 24/03/2021 Duration: 1 | #TheArctic & its unique | Ships in the Arctic (link) Published 25/03: | Impressions/reach: 983 |

| day<br><br>Statistics on 31/03/2021 | environment 🐼❄️ is often featured in the news as the #ClimateChange effects become more & more visible.<br>🗃️<br>😇What do you think?<br><br>❓How do satellites help mitigating the environmental impact of human activity in the Arctic? They...<br>- Increase shipping safety<br>- Warn of environmental threats<br>- Monitor land use changes<br>- All of the above<br><br>LinkedIn, Twitter | Tw, Ln, FB | Engagements (clicks, reactions, shares): 19<br><br>Answers: 5<br><br>Main answers: "All of the above" (2/5) & "Monitor land use changes" (2/5), one "Warn of environmental threats" (1/5) |
|---|---|---|---|
| 31/03/2021<br>Duration: 1 day<br><br>Statistics on 08/04/2021 (day later than usual) | This week let's talk #data!<br>🤓💾 Specifically, data derived from 🚜ground-based, 🚢sea-borne or 🎈air-borne monitoring systems commonly denominated "in situ" data.<br>❓When it comes to 🌍⚔️#EarthObservation-based innovation, why is #InSitu data important for your solution? 🤔<br><br>• It improves accuracy<br>• It lowers costs<br>• I need particular data<br>• All of the above<br><br><br>LinkedIn, Twitter | In situ for Earth Observation published in 2020 (link):<br>Tw, Ln, FB | Impressions/reach: 2717<br><br>Engagements (clicks, reactions, shares): 50<br><br>Answers: 16<br><br>Main answers: "It improves accuracy" (10/16), a few of "I need particular data" (3/16) & "All of the above" (3/16) |
| 08/04/2021<br>No poll, just article | | The Rise of the EO Platform Ecosystem published in 2020 (link):<br>Tw, Ln, FB | |
| 14/04/2021<br>Duration: 1 day<br><br>Statistics on 30/04/2021 | In the last 50 years, the 🌍global population has doubled 👥& we try to address growing concerns relating to the environment & critical natural resources. How can #space help?🤔<br>❓ What added value can space technologies bring in the context of sustainable development?<br>• Efficiency gains<br>• Increased accountability | Space technology in support of sustainable development (link)<br>Twitter, LinkedIn, Facebook | Impressions/reach: 3715<br><br>Engagements (clicks, reactions, shares): 32<br><br>Answers: 18<br><br>Main answers: "All of the above" (17/18), "Increased accountability" (1/18) |

| | | | |
|---|---|---|---|
| | •     Higher social awareness<br>•     All of the above<br><br>LinkedIn, Twitter | | |

*Table 1 PARSEC Social Media polls with statistics*

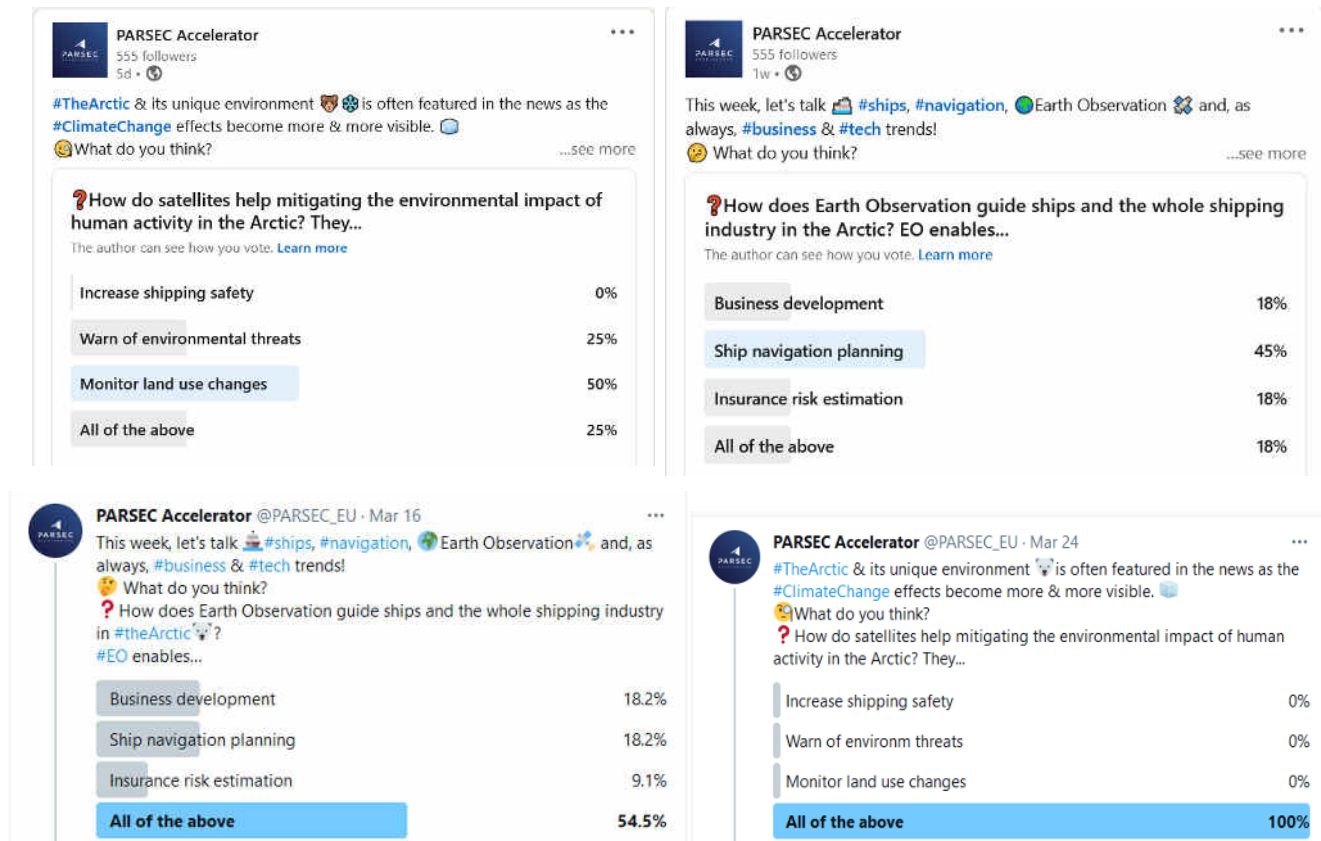Some examples of these polls on LinkedIn and Twitter:



*Figure 31: Polls on Social Media*

# 4 Summary

The performed actions have achieved successfully the purposes of coordinating a systematic review of recent developments of technologies in EO and in key emerging industries (food, energy, environment) and to disseminate this information to the PARSEC beneficiaries and to the general public.

Some of the gathered statistics and outputs of the performed actions confirm their usefulness and efficiency:

- New content created directly by PARSEC partners:

The number of provided articles almost doubled since the beginning of the project (19 new articles in Insights section in PARSEC webpage and 44 articles in total since the beginning)

- Content studied by PARSEC beneficiaries and general public:

more than 2.500 views of the articles, having the article "InSAR Applications – Why industry is learning to "love" radar" more than 400 views and the following articles with more than 90 views:

| Title of the article | Pageviews |
|---|---|
| Smart Solar Energy planning and real-time management | 99 |
| InSAR Applications – Why industry is learning to "love" radar | 406 |
| In situ: Earth Observation is not only Space | 151 |
| Drones and HAPS bringing new opportunities closer to the Earth | 137 |
| Smart Specialisation (Strategy) | 125 |
| The rise of the EO Platform Ecosystem | 178 |
| Copernicus Start-up Programme | 95 |
| How new satellite technologies are creating market opportunities | 93 |
| Common Agricultural Policy | 398 |

*Table 2 PARSEC Insights – mostly viewed articles*

- Events to analyse technology trends and main challenges in the three emerging industries (Energy, Environment, Food) and the connection of EO with them:

PARSEC User and Technology Talks:
- o In total almost 200 registered attendees for the three sessions
- o More than 270 views of the YouTube recorded sessions
- o 3 experts from EO disseminating the potential use of EO to Energy, Environment and Food sectors
- o 10 experts from the 3 Sectors (Energy, Environment and Food) opening their mind to new EO products or services and their application to their sectors
- o 10 presentations from the #15PARSEC to the Energy, Environment and Food sectors: Helping the 15 consortia to show their businesses ideas to potential customers and to
- o The 15 consortia having the possibility to attend to events where the future of the three emerging industries were analyzed by experts in the sector (big corporates, SMEs and research centers).
- Polls on social media to know the opinion of the PARSEC ecosystem about the technologies and changing trends:

We have achieved a lot of interactions (detailed data on section 3.4) with PARSEC beneficiaries and general public: almost 25.000 impressions of the polls, more than 470 engagement and 166 answers to the polls.

PARSEC Team believes that the taken actions fulfilled the set goals and expectations. The PARSEC community is very lively and wants to actively participate in the proposed activities. After the submission of this deliverable, several publications are still foreseen, hence, the tool – PARSEC Insights – will remain active.

![PARSEC ACCELERATOR logo]

## Our Partners