

General Meeting of members of the European Centre for Space Economy and Commerce, Vienna, 9 November 2022

Splinter session - fiches

This file gathers the five fiches prepared for the splinter session which will take place in the afternoon during the General Meeting of ECSECO.

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1. Space Economy

The Space Economy is defined by the OECD as the full range of activities and the use of resources that create value and benefits to human beings in the course of exploring, researching, understanding, managing, and utilising space¹.

Space activities are usually structured along two main segments: upstream manufacturing, launch and ground segment activities and the downstream operations and services. The space industry operates upstream of the value chain that flows downstream to the end-users of space-based capabilities.

As outlined in the second edition of the OECD *Handbook on Measuring the Space Economy*, there have been many changes in the space economy over the past decade, notably with a constantly growing number of countries and private entities involved in space activities.

While a wide range of new and improved industry surveys has been developed by many space nations and concrete progress has been made in terms of publicly available data and its overall quality, yet many issues remain related to the production of reliable, robust throughout the time and comparable space economy statistics.

Identifying Relevant Questions for ECSECO:

A selection of questions to be considered by the “Space Economy” workstream is provided below:

Existing initiatives on space economy

A. Mapping of the existing initiatives/platforms on space economy and their main outputs

Measure of the space economy

B. Existing research on national space economies

- Mapping of key figures available
- Investigation of existing data sources

C. Measuring the downstream economy

D. Measuring the market potential of space in other sectors

E. Forecasting the space economy

Measure of the socio-economic impact of space

F. Economic theories applied to socio-economic impact of space (including environmental economics, behavioural economics, etc.)

G. Expanding the use of bibliometrics

¹ OECD, *Handbook on Measuring the Space Economy, 2nd Edition, 2022*

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Space economy specific research topics

H. Structure of space economy and drivers – Applied industrial economics

I. Measuring the contribution of space to innovation performance

J. Policy analysis – Role of the public sector to foster the space economy

Members are invited to provide recommendations on topics ECSECO could address within this workstream.

ECSECO Activities on Space Economy:

A selection of suggested activities for the “Space Economy” workstream is provided below:

- Thematic report
- Annual space economy day
- Thematic workshop
- Student competition – outputs presented at annual university symposium
- Student project

Members are invited to provide further suggestions and recommendations on activities ECSECO could pursue within this workstream.

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2. Intellectual Property

Intellectual Property and New Space

The space sector is evolving towards having more private investment, that increasingly considers space as a growing market in what is called the “New Space”. This change increases the competition within the space sector and therefore the European space industry should reconsider the most adequate strategy to protect their intellectual property and choose the appropriate legal instruments to protect the different key technologies from inventions, software databases or the data in its essence.

IPR such as patents, trademarks, industrial design and copyright provide means to safeguard knowledge and innovations for the European industry. The use of patents enables the protection of novel technical inventions to claim exclusivity on their commercial exploitation. In the high-tech space domain, patent protection is one of the factors on which government, companies and academia could leverage to increase the return on their R&D investment. Patents also provide a lever for access to finance and to create new partnerships through licensing or technology transfer.

Intellectual Property as a key asset for commercialisation

In this splinter session, we would like to understand the challenges industry may be facing to protect their IP and to incorporate it as a key asset for their businesses and commercial strategy.

Participants are invited to share their challenges and best practices in formulating their IP strategy as part of the business developments. Furthermore, the session will explore challenges faced in e.g., IP regulations, financial frameworks, policy, etc., relevant to the space sector.

More information

[EPO - A new patent insight report on space-borne sensing and green applications](#)

[https://documents.epo.org/projects/babylon/eponet.nsf/0/E1DF0B13D852BB7BC12586FE0049DC4A/\\$FILE/patent insight report-cosmonautics en.pdf](https://documents.epo.org/projects/babylon/eponet.nsf/0/E1DF0B13D852BB7BC12586FE0049DC4A/$FILE/patent%20insight%20report-cosmonautics_en.pdf)

[https://documents.epo.org/projects/babylon/eponet.nsf/0/BC7DEF9C8AE740C8C125877D004ED4C6/\\$File/patent insight report quantum technologies and space en.pdf](https://documents.epo.org/projects/babylon/eponet.nsf/0/BC7DEF9C8AE740C8C125877D004ED4C6/$File/patent%20insight%20report%20quantum%20technologies%20and%20space_en.pdf)

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3. New-Business Models and Customer-Provider Relationships

The space sector is undergoing rapid and profound change. Traditionally, the space industry has been the domain of public investments, government programmes, and large integrators. This picture has changed drastically over the last decades. The fundamental shift from an industry heavily dependent upon public actors and government funding to one increasingly driven by private actors is a key characteristic of what is often labelled as New Space.

One successful driver of this change is ESA's expanding network of incubation centres across Europe (ESA BICs), from only one in 2004 to 25 centres in 80 locations today, having supported around 1400 new ventures.

Today, established and emerging actors in the space sector are challenged to offer innovative value propositions to address an increasingly commercial-first demand environment. This dynamic has resulted in new business models and provides an impulse to redefine customer-provider relationships, notably driven by the below dynamics:

Space-as-a-Service

New Customer Competencies

Vertical Integration

Space-as-a-Service is indicating a shift towards the commoditization of space-based goods and services, allowing existing and new users to exploit and explore space without the need of designing, developing, launching, and operating space systems. It includes a range of value propositions at different levels of market maturity and prevalence.

The **development of new customer competencies** transforms actors once considered core customers into self-reliant entities, removing a considerable amount of demand from the market. This development can open a plethora of questions on relations between providers and end-users, and in many cases positions and integrates space solutions at the heart of the digital economy.

Vertical integration is making its mark both in terms of enabling supply chain optimization and allowing for process flexibility. As a downside, it requires high upfront costs and does not apply to all sub-sectors and company sizes. Nevertheless, it is disruptive for both public programmes as well as component and sub-system manufacturers and service providers, as it challenges postulates on which their business models are based.

These developments are reflected in vigorous industry (sub)segments, where new actors continuously emerge alongside new business ideas, and new business models developed at a high rate, creating a dynamic competitive landscape.

This accentuates the importance of evolved roles public actors are required and expected to carry out, going beyond traditional approaches for the implementation of public programmes. These shifts open

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questions on adapted tools for attaining key industrial policy objectives: competitiveness, innovation, autonomy and resilience.

Identifying Relevant Questions for ECSECO:

A selection of initial questions to be considered by this workstream is provided below:

- How can public tools be best designed and deployed in an increasingly commercial environment?
- How can business-oriented innovation be better reflected in innovation dynamics?
- How to best engage and integrate end-users into business development processes?
- How can business development and innovative corporate governance lessons be best shared with early-stage entrepreneurs?
- How can public actors best facilitate a move from procuring systems to fostering solution development?
- What are the synergies and risks related to the convergence of public and private objectives?

Members are invited to provide recommendations on topics ECSECO could address within this workstream.

ECSECO Activities on Perspectives on Future Markets:

A selection of suggested activities to be pursued by this workstream is provided below:

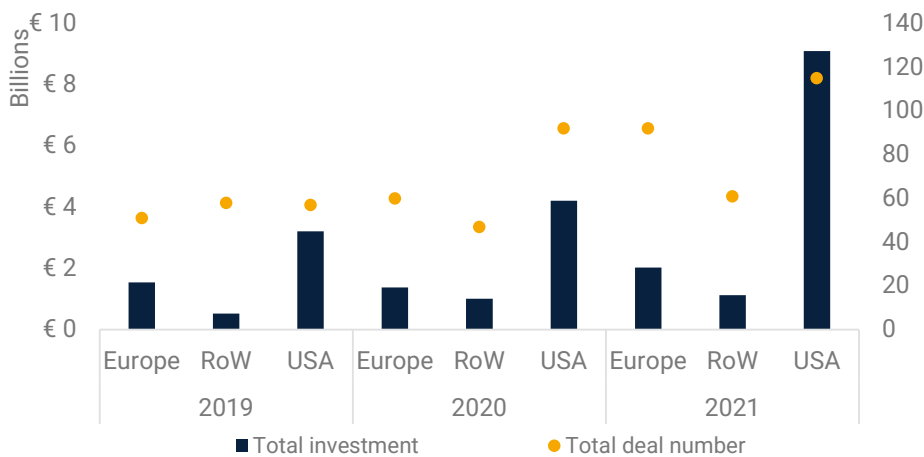
- Mapping and tracking maverick business models across different industrial sectors.
- Joint research through surveying and landscaping the impact of deployed public tools.
- Analysis of the correlation between innovation and service-driven demand.
- Educational courses on business-development models and growth-enabling corporate governance structures.
- Exploring the relationship between *commoditization* and *race to the bottom* dynamics.

Members are invited to provide further suggestions and recommendations on activities ECSECO could pursue within this workstream.

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4. Financial Markets and Investment

Since the emergence of New Space, an estimated total of \$52.2 billion has been invested in space start-ups globally. 50% of this total comes from venture capital and 15% from seed/prizes/grants with the rest originating from debt financing, public offerings and acquisitions. Most of the European New Space Ecosystem has either relied on private investments or is expected to rely on them in the future. The identified investment volume and deal number per region are presented below.



The ratio of private space investments to public space budgets has quickly grown, reaching 20% in the United States and 17% in Europe in 2021. While the comparison holds limitations, notably as public budgets represent a demand for space infrastructure and services. It nevertheless highlights how critical private investments have become to the New Space ecosystem in Europe and how much the public sector and private investment increasingly work hand in hand to stimulate the growth of European start-ups. The importance of private investment is expected to continue as space solutions help tackle ever more important environmental, social, and governance (ESG) challenges - areas representing large potential sources of profit.

In 2020, the total private investments in European tech start-ups amounted to €12 billion, with investments mostly into ICT (50%), biotech & healthcare (23%) and consumer goods and services (10%). In comparison, the private investment in space start-ups in Europe amounted to some €611 M in 2021.

Yet, as the evolution of the sector is expected to further rely on private capital, the European New Space ecosystem is increasingly exposed to financial market volatility. This indicates a normalisation of space as an investment domain and challenges public actors to integrate emerging investment trends into their pursuit of public objectives. It also raises questions related to (i) the financial resilience of the sector and (ii) the limits of relying on investment vehicles that might not always be tailored to the development cycles and business models of space companies.

To address some of these questions while leveraging the investment dynamic, public actors are now deploying market-inspired financing and support mechanisms, with the European Space Agency

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increasingly active in facilitating access to finance for the European space industry, with the Agency proposing the ScaleUp Programme at the ESA Council Meeting at Ministerial Level, the first ESA programme intended to accompany end-to-end European entrepreneurs in their journey to scale up global space markets.

Moreover, the European Commission's Cassini Space Entrepreneurship initiative is now active, alongside the InnovFin – EU Finance for Innovators initiative launched by the European Investment Bank Group (EIB and EIF) and the European Innovation Council Fund's Accelerator programme.

Identifying Relevant Questions for ECSECO:

A selection of questions to be considered by the "Financial Markets and Investment" workstream is provided below:

- How does the availability of funds in a post-quantitative easing landscape impact the sector?
- To what extent does a market downturn influence the long-term prospects of the European space sector?
- How can public actors best integrate investment trends into their public policy approach?
- How can synergies among different public instruments be best leveraged?
- Which investment vehicles are best tailored to the space sector development cycles?

Members are invited to provide further suggestions and recommendations on topics and questions ECSECO could address within this workstream.

ECSECO Activities on Financial Markets and Investment:

A selection of suggested activities for the "Financial Markets and Investment" workstream is provided below:

- Executive courses on available investment vehicles and market dynamics.
- Investor landscaping and strategic advisory for space start-ups.
- Joint research on the impact of business performance on space industry valuations.
- Analysis and ideation of KPI's to assess the state of the ecosystem beyond investment dynamics.

Members are invited to provide further suggestions and recommendations on activities ECSECO could pursue within this workstream.

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5. Perspectives on Future Markets

The space sector, building on decades of experience, is facing market shifts offering opportunities for the next giant leap. This is enabled by an evolution of a commercially driven ecosystem, with a growing role of space in digital green and security challenges. This ecosystem, composed of emerging, underexploited, and unexplored market segments is characterized by increased private ambitions, new value propositions and the (potential) long-term evolution of outer space as a self-sustaining domain of human activity and interaction.

Private capital & new business models (approached in separate splinter sessions) have paved the way to a new way of developing space capabilities that can result in faster, less risk-averse, innovation cycles and open new prospects for future space markets. Moreover, vibrant innovation ecosystems often yield spill-over effects across a wide spectrum of activities, beyond initial R&D objectives.

In the downstream sector, we can confidently anticipate increased uptake and blending of space-based services to terrestrial applications, with space solutions increasingly integrated into all aspects of society and across different industry verticals.



The turning point in the upstream would however be the emergence of a thriving in-space economy. A non-exhaustive selection of emerging or unexplored market segments is provided below:

If materialized, these markets will give rise to new approaches in space operations and hold implications for the entire value chain. Only by addressing possible future commercial growth areas, we can ensure to reap the benefits through potential high economic multiplier effects. Yet, emerging and unexplored space markets are (by nature) difficult to estimate and forecast, as demand and potential customers are difficult to identify and anticipate. Moreover, when addressing future (uncertain) markets, profitability and economic sustainability remain to be proven, and a positive return on investment can often only be expected in the long run, far beyond prevalent investment life cycles.

Should public actors explore evolved roles as market facilitators and creators, these segments need to be assessed individually to best define the timelines, objectives and roles public and private stakeholders can assume.

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In the early stages of market creation, models such as launching customer, anchor tenancy and brokering can be considered relevant, yet the long-term goal should be to foster a wide and diverse customer base, pursuing the objective of a self-sustaining commercial space ecosystem.

Identifying Relevant Questions for ECSECO:

A selection of initial questions to be considered by the “Future Markets” workstream is provided below:

- How can Europe best seize new market opportunities and secure first-mover advantages?;
- How can we best assess the viability and size of emerging and unexplored markets?;
- How can the creation of new markets create vibrant innovation ecosystems with far-reaching spill-over effects?;
- What would be the impact of individual market segments on the existing value chain?;
- How have public and private stakeholders approached the creation of new markets beyond space?

Members are invited to provide further suggestions and recommendations on topics and questions ECSECO could address within this workstream.

ECSECO Activities on Perspectives on Future Markets:

A selection of suggested activities to be pursued by the “Future Markets” workstream is provided below:

- Mapping innovative value propositions of established and emerging industrial actors;
- Developing methodologies and tools for estimating emerging and unexplored markets;
- Joint research on tailored tools and approaches to foster vibrant innovation ecosystems;
- Sharing insights on best practices in creating and fostering thriving commercial markets;
- Joint research on case studies for best practices and lessons-learned in market creation.

Members are invited to provide further suggestions and recommendations on activities ECSECO could pursue within this workstream.