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CAPACITY & SUPPORT FOR
SUSTAINABLE SPACE INNOVATION

Empowering
innovation intermediaries
to generate sustainable
initiatives to incentivise
and accelerate
the commercialisation
of space innovation

D4.6 Policy Recommendations

This project has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement no 101004212.

Grant Agreement 101004212

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COORDINATION AND SUPPORT ACTION

D4.6: Policy Recommendations

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D4.6 Policy Recommendations

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Thriving entrepreneurial ecosystem are built on 8 components

> "Technological Innovation is critical to long-term economic growth"
>
> Branscomb & Auerswald, 2002

Technological innovation has long been identified as a key driver of GDP growth. In addition to long-term economic growth, science- and technology-based innovations can help unlock a swathe of benefits for citizens and communities. As such, boosting the innovation potential and capabilities of a region or nation is a common priority.

Branscomb and Auerswald assessed the conditions needed to turn science or technology-based inventions – defined as commercially promising products or service ideas – into innovations, meaning the successful entry of these products or services into a particular market. They concluded that national investment into this conversion "significantly affects long-term economic growth, converting the nation's portfolio of science and engineering knowledge into innovation generating new markets and industries", thus helping to unlock a wide variety of socio-economic benefits.

Entrepreneurs as drivers of innovation, supported by a diverse and enabling ecosystem

There cannot be an innovation system without entrepreneurs. However, entrepreneurs are better viewed as a necessary but not sufficient driver of innovation. Indeed, successful innovations arise from entrepreneurship ecosystems involving a number of key actors complementing and supporting new and growing enterprises, including universities, financial firms, large firms, and public organisations. Several different definitions of entrepreneurship ecosystems exist in academic literature; most describe it as an interconnected set of actors and conditions, categorised into different domains. Despite these different versions, many of them share significant similarities, including the identification of the key role to be played by public entities, the importance of well-established business support mechanisms, and the need for facilitated access to finance

Sources: Branscomb and Auerswald (2002), Hekkert et al (2007), Brown & Mason (2017), Isenberg (2011), SpaceTec Partners analysis.

Defining innovation frameworks for the space sector

SpaceTec Partners, leveraging its extensive knowledge of the space sector as well as existing research on successful entrepreneurial ecosystems, developed a concrete methodological framework to assess a country's or region's Space Innovation Support Framework. The framework is designed to support public actors in providing services to innovators, enabling their endeavours, improving their survival rate and helping them scale faster when ready. Eight key components for a successful space innovation ecosystem have been identified and defined.

SpaceTec Partners's Space Innovation Support Framework

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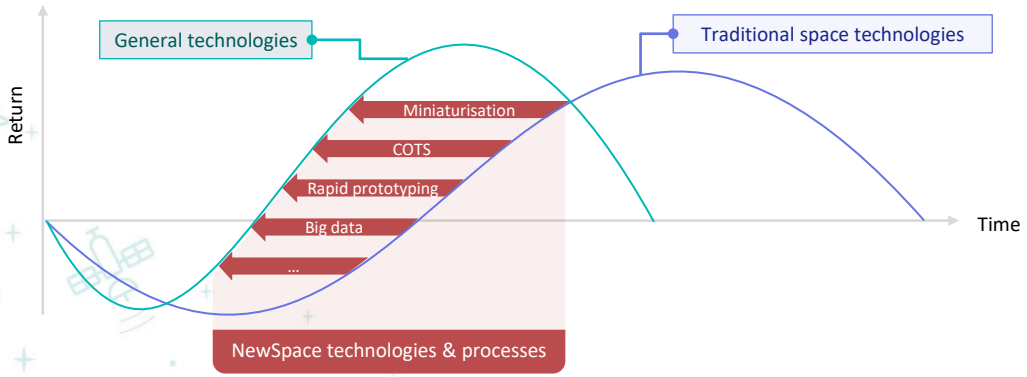
Innovation support in the NewSpace era: parallel development

The relevance for space start-ups

Space, as a deep tech industry, is characterised by high technology and market risks. This is especially true for start-ups targeting disruption in upstream services. These ventures face lengthy payback periods, although NewSpace processes such as miniaturisation and COTS have caused a contraction of the business life-cycle of traditional space technologies. The NewSpace approach has developed in parallel to innovation ecosystems, helping to democratise access to the space industry for new and emerging players as well as pushing diversification activities of traditional actors.

The SpaceTec Partners definition of NewSpace and its S-Curve

NewSpace is a global trend encompassing a series of technological and business model innovations leading to a reduction in costs, shorter lifecycles and a bolder approach to risk taking in the space sector. The NewSpace era has been characterised by the development of a private space industry primarily driven by commercial motivations and often backed by risk capital seeking a return, while simultaneously being supported by an innovative public sector aimed at promoting innovation and competitiveness, as well as creating business and demand.



Sources: SpaceTec Partners analysis.

Case study: The transformation of Luxembourg into a dynamic start-up ecosystem

Luxembourg has successfully fostered the **emergence of a fertile ecosystem supporting innovation and entrepreneurship**, both in space and in a wider context. It has carried out dedicated initiatives in targeting many if not all of the components of a successful Space Innovation Support Framework.

Indeed, Luxembourg established favourable regulatory framework conditions and leveraged its remarkable **innovator-investor proximity** to attract new and foreign business into the country. This has not been limited to start-ups, but includes **influential industrial players** from both traditional space such as OHB Luxembourg as well as leading NewSpace such as Spire. These initiatives have been supported through the establishment of a **dedicated space VC fund in Luxembourg**, Orbital Ventures, closing at €120 Mn with a €40 Mn investment from the EIF.

Luxembourg has supported the expansion of its national innovation agency, Luxinnovation, and its dedicated acceleration programme Fit4Start. The programme now offers **tailor-made support to various start-ups in space**, including by providing access to EO data provided by the Luxembourg Space Agency data centre. Furthermore, the state established a dedicated space resources utilisation department (ESRIC) within the Luxembourg Institute of Science and Technology. ESRIC, providing **incubation and business support** to young start-ups, is supported by the LSA, LIST, Luxinnovation as well as ESA as a strategic partner.

Finally, the state regularly organises key yearly conferences and events such as Space Resources Week and the NewSpace Europe conference, and has increasingly targeted talent attraction by fostering **space education courses at the University of Luxembourg**.

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Policy & regulation: fertile ecosystems through policymaking

National and regional policymakers are both at the core and the forefront of innovation

Government actors, including national and regional entities, are one of the core elements of a successful innovation ecosystem, and play a key role in establishing the conditions enabling inventions to be developed into innovations, bridging the so-called Valley of Death. While traditionally governments provide only a fraction of the total early-stage technology development funding, several enabling conditions are established through proactive initiatives, including financial support frames facilitating and accelerating space innovation.

Innovation policy acts as the interface between research and technological development policy on the one hand and industrial policy on the other. As such, its primary aim is to create the overarching framework conducive to brining ideas and inventions to the market. Innovation policy can help create a supportive environment by providing funding, resources, and incentives to encourage the development of new technologies and business models. It can also help to build partnerships between government, industry, and academia to promote collaboration and knowledge sharing. Ultimately, innovation policy can play a critical role in ensuring that the space sector remains competitive and innovative, driving growth, and creating new opportunities for businesses and individuals alike.

The implementation of innovation policy, both at large and in the space sector specifically, typically involves regulatory measures designed to foster a supportive environment for innovation. These are most commonly associated with creating favorable tax policies but include a wider range of public undertakings. These include providing grants and loans to support research and development, streamlining the regulatory process to make it easier for companies to obtain permits and approvals for new projects, establish favourable property rights and patent regulations, and in general alleviating the administrative burdens for young start-ups.

Recommendations

1. Ensure **favorable framework conditions through flexible policies** facilitating **development stages,** such as **regulatory sandboxes** and **fast-tracking approval processes**

   A thriving innovation support ecosystem enables entrepreneurs not only by streamlining administrative or bureaucratic processes, but also ensuring policies and regulations do not stifle or impede R&D. For instance, sandboxes such as the US SPRINT programme allow innovators to test new space technologies in a controlled environment, avoiding potential burdens and accelerating progress.

2. Establish policies for **technology transfer, funding** programmes or **tax incentives** for universities and public research institutions to **license technologies** and create **spin-off** companies

   Focus should be placed on policies such as R&D tax credits, designed to encourage companies to invest in R&D, as well as capital gains tax exemptions, offering tax breaks to actors investing in spin-offs. Tax holidays (periods of time during which companies are exempt) can also support start-ups and spin-offs.

3. Collaborate with **industry experts, academia**, and other **relevant stakeholders** to gain a deep understanding of the current state of innovation and the potential impact of regulatory policies

   Alignment between policymakers and active stakeholders through dedicated meetings and industry associations ensures policy optimisation for the development of the innovation ecosystem.

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Academia: boosting research & spin-off potential

Academic institutions lead research efforts while supporting entrepreneurial education

Academia plays a critical role in supporting innovation, particularly in the development of new technologies and scientific breakthroughs. Universities and research institutions are often at the forefront of cutting-edge research and development in various fields, including the space sector. As such, academia serves as a source of knowledge, expertise, and talent that can help drive innovation in the industry, as well as driving the deal flow generation of innovation and start-up creation.

One way in which academia supports innovation is through research partnerships with industry. By collaborating with companies, researchers can apply their knowledge to real-world problems, helping to develop new technologies and products that can bring value to the space sector. Additionally, academic institutions can serve as incubators for start-ups and spin-off companies, providing mentorship, resources, and access to funding to help these new ventures grow.

Academic institutions can also help to train the next generation of innovators and entrepreneurs through educational programmes in science, technology, engineering, and mathematics (STEM) fields. These programmes provide students with the skills and knowledge they need to succeed in the space sector, whether as researchers, engineers, or business leaders. Furthermore, academic institutions can foster a culture of innovation by encouraging collaboration, creativity, and risk-taking among their students and faculty, promoting a mindset that is essential for driving innovation in any industry.

Academia can also engage in scientific outreach to the public, organising and hosting public events, hosting space-related activities, and offering online content that can help promote interest in the space sector as well as help establishing networks and boosting the region's international reputation. This outreach can also help to foster a new generation of enthusiasts and innovators who may go on to pursue careers in the space industry.

Recommendations

1. Incorporate **business** and **entrepreneurship courses** within technical degrees, **bridging the gap between academia and industry**.

Business courses within technical education enables students to develop skills and assimilate knowledge necessary to transform their technical ideas into successful businesses. By learning about topics such as finance, marketing, and entrepreneurship, students can gain a better understanding of how to bring their technical innovations to market and create value in the space sector.

2. Encourage universities to **foster the creation of spin-offs** from successful research projects, and gradually look to **establish a strong entrepreneurship culture**

To encourage the creation of spin-offs, universities should promote entrepreneurial awareness and cultivate a culture of entrepreneurship among their students, staff, and alumni. This can be achieved through inspiring entrepreneurial role models and success stories. Additionally, actively nurturing entrepreneurial talent and providing proactive support to founders can help mitigate challenges stemming from a lack of entrepreneurial legacy.

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Case studies (1/4)

Policy & regulations: the space strategy of the United Kingdom

The United Kingdom stands out as a compelling example of effectively leveraging policy and regulations to **foster entrepreneurship and innovation within the space industry**. Through key policy actions, including the development of a **comprehensive space strategy**, the UK has established favourable conditions for entrepreneurs to develop innovative solutions. The UK Space Strategy highlighted several key aspects to support the growth and development of the national entrepreneurial ecosystem. For instance, the strategy sets out initiatives to break down the **barriers to public sector procurement** as well as **facilitating access to finance and insurance**.

Furthermore, the UK government's commitment to space innovation is evident in the establishment of regulations such as the **UK Space Industry Act**, regulating launch operations from the UK while supporting the growth of commercial space activities. For instance, as set out in the national strategy and implemented through the Space Industry Act, all spaceflight operator licences will contain a limit of liability, ensure that no operator will face unlimited liability for activities carried out in compliance with the act. Additionally, the UK Space Agency's flexible and responsive approach to regulatory oversight has allowed for swift adaptation to emerging technologies, facilitating the testing and deployment of novel space solutions.

The overall approach of the UK for space innovation is very much aligned with the **overarching UK Innovation Strategy**, which identifies the priority technologies driving the innovation and growth of the space sector. The UK has been successful in building upon and expanding their successes in dedicated initiatives such as the **National Space Innovation Programme**, setting these as key activities in high-level strategic policy documents and regulations.

Academia: the case of Slovenia

Slovenia has emerged as a country that has **effectively harnessed the potential of academia** to propel its innovation ecosystem forward. One of the key factors contributing to this success is the strong partnership between universities, research institutions, and industry players. This collaboration has facilitated the seamless flow of knowledge, expertise, and resources, fostering a dynamic exchange that nurtures innovative ideas from conception to implementation.

Central to Slovenia's success is its commitment to fostering a culture of **research and development** within academia. The government's consistent investment in research and education has paved the way for universities to engage in cutting-edge research. Slovenia has the highest R&D expenditure (as percentage of GDP) of CEE states, and is one of the top countries in patent filings and H2020 projects per capita. Additionally, **several space start-ups were born as spin-offs** from universities; SkyLabs is one example, born from the University of Maribor.

Furthermore, Slovenia's emphasis on technology transfer and entrepreneurship has been a driving force behind its innovation achievements. The establishment of technology parks, incubators, and accelerators has provided a nurturing environment for turning academic research into market-ready products and services. For instance, the Innovation Fund of the University of Ljubljana is one of the mechanisms pushing knowledge and IP transfer to the business sector, providing financial support for projects, mentoring of research teams, as well as support to commercialisation activities. Recently, Slovenia has established a new agency, ARIS, bringing **research and innovation** under one roof and facilitating the transition of **projects from research to market**.

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Industry: improving cross-fertilisation with start-ups & scale-ups

Industry catalyses demand for innovative solutions and provides key expertise

Industrial players are a key component of a region's innovation ecosystem, covering a multitude of roles, including for the development and commercialisation of new products and services. Established companies in the space sector have the resources, expertise, and market knowledge to transform scientific breakthroughs into practical applications that can unlock various socio-economic benefits. Through research and development, industry players can directly drive innovation and create new opportunities for growth and expansion. Moreover, industry can play a vital role in commercialising innovations by taking them to market. Through product development, marketing, and distribution, companies can bring new products and services to consumers, driving demand and growth.

Additionally, industry can support start-ups and spin-off companies by providing resources, mentorship, and funding to help them grow and scale their businesses. By investing in these new ventures, established companies can help create a fertile and vibrant ecosystem of innovation, driving the development of new technologies, products, and services. Additionally, industry can provide valuable market knowledge, networking opportunities, and expertise to help start-ups and spin-offs navigate the complexities of the space sector and build successful businesses.

Industry also drives innovation through the development and adoption of new technologies and practices. Embracing digital transformation, automation, and other emerging trends, improves companies' productivity, efficiency, and competitiveness, while also driving innovation across the industry. As such, innovative solutions are often a result of engagement with new processes, as clearly shown by NewSpace. This can lead to the creation of new business models, products, services, and new markets, resulting in continued growth and evolution of the space sector.

Recommendations

1. Provide **incentives** for **established industrial players** to engage with the **innovation ecosystem**

Policymakers can offer fiscal benefits such as tax breaks and funding as well as non-fiscal incentives to encourage industry to invest in and support the region's innovation ecosystem. This could include incentives for research and development, collaboration with start-ups or local universities, or participation in and sponsoring of innovation-focused events, challenges or competitions.

2. Foster the emergence of **innovation hubs** and **technology parks** to help establish close connections and **facilitate knowledge transfer** from industry to start-ups

Establishing key infrastructure helps create regional innovation centres and hubs wherein start-ups and industrial players can collaborate, share knowledge and network; these environments are key to support partnerships between emerging and established industry as they can enable rapid scale-up.

3. Encourage industry to **develop innovative solutions** through **innovation procurement** or **pre-commercial procurement**

Public procurers can challenge industry from the demand side to develop innovative solutions, effectively acting as first customers for products and services. Public entities buy the development and testing of new solutions, fostering their industry's growth and international leadership.

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Access to finance: fueling R&D and driving start-up growth

Swift access to finance ensures growth and materialisation of innovations

Access to finance is critical for the growth and success of start-ups in the space innovation sector. Start-ups require significant financial resources to bring their ideas to market, develop prototypes, conduct research and development, and scale their operations. Without sufficient funding, many promising innovations may never be materialised. Space start-ups often face challenges in securing funding from traditional sources, such as banks and venture capital firms. These sources often require a proven track record, a substantial amount of collateral, and high levels of risk aversion, which can make it challenging for start-ups to access the necessary capital. To address this challenge, several alternative funding models have emerged in recent years, including angel investing and venture capital or private equity.

Another important source of funding for start-ups in the space industry is government grants and subsidies. Government investments into supporting start-ups and SMEs in the innovation sector through grants and subsidies can provide new ventures with the financial resources they need to develop their technologies, hire talented employees, and scale their operations.

Public funding can also come from international organisations. For instance, the European Investment Bank has looked to increase its investments in space start-ups by providing venture debt, while the European Innovation Council Accelerator provide valuable financial support to space start-ups and established companies. Moreover, ESA Business Incubation Centres (BICs) have strongly supported the early development of space start-ups throughout Europe. These innovation mechanisms can offer low-interest loans, grants, and other financial instruments to help companies scale their operations and develop new technologies. By providing access to international funding, companies can tap into a wider range of resources and expertise, enabling them to grow and innovate more quickly.

Recommendations

1. Strengthen and expand **government funding programmes** dedicated to space start-ups

   Dedicated public investment funds in support of the space start-ups ecosystem should be established and bolstered. Efforts should be made to ensure that this targeted funding reaches a diverse range of players, including those in different stages of development and those focusing on different aspects of the sector, while ensuring alignment with the overall national or regional space strategy.

2. Encourage the development and use of **alternative funding models**, including **angel investments**, **corporate venture**, **private equity** among others

   Establishing key infrastructure helps create regional innovation centres and hubs wherein start-ups and industrial players can collaborate, share knowledge and network; these environments are key to support partnerships between emerging and established industry as they can enable rapid scale-up.

3. **Leverage international funding** fostering collaboration between established space nations and new emerging players in the ecosystem

   Policymakers should actively engage with international organisations such as the European Investment Bank and the European Innovation Council to secure funding and support for local start-ups.

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Case studies (2/4)

Industry: the case of Aerospace Valley

Aerospace Valley, located in southwest of France and established in 2005, is one of the forerunners for **European competitiveness cluster in the aerospace sector**, serving Space, Aeronautics and Drones. It comprises large companies, research centres, professional organisations, public authorities, training centres, financial organisation and more than 580 SMEs, offering targeted services to support their development and contacts with larger industrial players. Aerospace Valley supports the regional entrepreneurial ecosystem through various initiatives, including dedicated programmes (e.g., BOOSTER NOVA), propelling space sector-related start-ups through ESA BIC Sud France, as well as bolstering the international development of the NewSpace market.

This latter initiative is carried out through the **NewSpace Factory**, which brings together 11 French talents known as Space Enablers. Their main goal is to support the growth of the NewSpace industry by tapping into their extensive industrial experience, product expertise, and knowledge developed over 50 years of French R&D. Together, they have contributed to more than 250 space projects, with 40 currently operational in orbit. They possess a unique **industrial capacity worldwide**. The NewSpace Factory offers a **streamlined approach to accessing the industrial chain** through an unrestricted service, enabling access to France's space technology and expertise via a single online entry point, facilitated by the Space Enablers.

Aerospace Valley has been and is consistently supported by both regional actors, national government schemes (e.g., through BPI or ADEME) as well as through European RDI schemes (e.g., Horizon Europe).

Access to Finance: the case of CosmiCapital

The French space entrepreneurial ecosystem was provided a significant boost in terms of its access to finance in 2021 after the **establishment of CosmiCapital**. Indeed, the innovation capital fund initiated by CNES is entirely **dedicated to NewSpace investments**, supporting entrepreneurs and innovators within the framework of the Future Investments Program (PIA). The PIA is overseen by the General Secretariat for Investment to the Prime Minister and is designed to finance innovative projects over a decade in order to drive the country's transformation, sustainable growth, and the creation of future jobs. From generating new ideas to introducing fresh products or services, the PIA supports innovation at every stage.

CosmiCapital, managed by Karista, was **subscribed by CNES** as well as the **National Seed Fund 2**, managed on behalf of France by Bpifrance, and was established in partnership with ESA. The fund was designed to invest in young French and European companies developing NewSpace solutions, and had an initial investment capacity of €38 million. According to Karista, six investments were planned for 2022, with an investment period of 5-7 years.

The investment fund has established a strategic partnership with the European Space Agency, granting it privileged access to **approximately twenty incubation centers** operated by the agency. This collaboration also extends to the network of **600 companies** currently nurtured within these centers. Additionally, the fund enjoys access to resources from acclaimed accelerators such as Starburst Aerospace and SpaceFounders, augmenting its capabilities further.

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Talent attraction: boosting innovation through talent pipelines

Talent attraction & retention perpetuates the ecosystem's innovation capacity

Talent attraction is critical for innovation support and is particularly important for start-ups and young enterprises. Building a team of skilled, talented and dedicated individuals is essential for creating a culture of innovation and for developing new and groundbreaking products and services. As such, policymakers' focus is often placed on fostering local talent attraction and retention.

One of the key ways in which talent attraction can support start-ups is by bringing in individuals with diverse skill sets and backgrounds. By hiring employees with a wide range of expertise, start-ups can create a dynamic team that is able to approach problems from multiple perspectives and develop creative solutions that may not have been possible with a homogenous team. Successful talent attraction helps start-ups stay competitive by bringing in individuals with experience and knowledge of the latest trends and technologies. By staying up-to-date with the latest developments in their field, young ventures can stay ahead of the curve and continue to innovate in their industry.

Attracting talent to the space sector will require a comprehensive approach including both academic and industry involvement. As stated above, academia plays a key role in attracting talent to the sector through educational programs that cater to the demands of the industry, while industry partners can provide students with internships, mentorship, and access to cutting-edge technologies.

In addition to attracting new talent, a well-established and healthy innovation ecosystem must also ensure that talent successfully attracted to the space industry is then retained. Overall, talent attraction plays a critical role in innovation support for start-ups. By building a talented and diverse team, staying ahead of the latest trends and technologies, and offering opportunities for growth and development, start-ups can create a culture of innovation that fuels their success and helps them to stay competitive in their industry.

Recommendations

1. Facilitate partnerships between start-ups, established companies, and academic institutions to **create internships** and **mentorship** programmes

Students and young professionals can acquire valuable hands-on experience and exposure to cutting-edge technologies while providing start-ups with a pipeline of skilled talent. In addition, mentorship programs can help start-ups access the knowledge and expertise of experienced professionals in the space sector, supporting their growth and development. These frameworks could be expanded to target the up-skilling of existing space professionals, supporting their career development through dedicated courses as well as establishing key conferences and events.

2. Establish a **talent retention strategy** leveraging financial incentives, professional development opportunities, and supportive infrastructure

Incentives should be developed in order to make space start-ups more attractive for skilled professionals. These could include tax incentives, financial support for professional development, assistance with housing, as well as other non-financial benefits. Additionally, policymakers should consider providing support for start-ups to retain their top talent, such as offering tax credits to young companies retaining employees for two or more years.

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Business support & incubation: empowering entrepreneurs

Access to business support unlocks various benefits facilitating start-up development

Business support mechanisms are a cornerstone of innovation support frameworks, providing entrepreneurs with the tools and resources necessary to turn their ideas into successful businesses. Incubators offer a wide range of services, such as mentoring, training, and access to funding, that can help start-ups overcome common challenges and accelerate their growth. By providing a supportive environment, incubators can help entrepreneurs validate their business ideas, test their products, and develop the necessary skills to succeed in the market.

In addition to incubation, other business support mechanisms include accelerators, which are designed to help start-ups scale quickly by providing access to mentorship, networking opportunities, and funding. Accelerators typically work with startups that have already established their product-market fit, helping them to develop and execute a growth strategy. Additionally, innovation hubs can provide startups with affordable infrastructure, access to equipment, and networking opportunities with other entrepreneurs and industry experts.

Moreover, business support mechanisms can provide entrepreneurs with access to funding, which is essential for startups to grow and expand. This can include traditional financing options such as loans and equity investments, as well as alternative forms of funding such as angel investments. Business support organisations can also help start-ups navigate the complex world of funding, providing guidance on the best funding options for their business and connecting them with potential investors.

Finally, legal and regulatory support can be provided to start-ups through business support. This includes providing guidance on intellectual property protection, compliance with regulations, and legal structures such as incorporation. By accessing legal and regulatory expertise, entrepreneurs can avoid costly mistakes and focus on growing their business.

Recommendations

1. Develop public programmes or support private initiatives for **business incubation**, providing emerging entrepreneurs access to **mentorship**, **funding**, **infrastructures** and other resources

Business incubation programs are designed to foster start-ups by providing them with the resources and support they need to grow and succeed. Grants, loans or seed funding can help ventures cover initial set-up costs, while access to experts can enable networking, mentorship and training for start-ups to develop key skills and garner space-specific knowledge.

2. Establish **acceleration programmes** for promising start-ups and scale-ups looking to advance to the next stage of their development

Accelerator programmes act as key business support mechanisms for in an innovation ecosystem. They are designed to expedite the transition between proof-of-concept and product commercialisation, facilitating access to funding, resources, mentoring and education to young companies.

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Case studies (3/4)

Talent attraction: the case of Lazio Innova

Lazio Innova, a prominent regional innovation agency in Italy focusing on a variety of sector, including aerospace, has been at the forefront **of fostering entrepreneurship and nurturing young talents** through its diverse range of programs. One of their flagship initiatives aimed at young entrepreneurs is the "**Startupper School Academy**". The Startupper School Academy Program, supported by the Lazio Region, is conducted by Lazio Innova and integrated into the PCTO - Paths for Transversal Skills and Orientation, aimed at stimulating the creativity and inclination for **entrepreneurship of students, offering workshops, training sessions**, and **internship opportunities** that bridge the gap between academia and industry.

Furthermore, Lazio Innova provides support to aspiring entrepreneurs and students by offering mentorship, access to co-working spaces, and financial resources to help turn innovative ideas into thriving businesses. Lazio Innova understands the challenges faced by young entrepreneurs, and their comprehensive support system is designed to empower the youth to create **impactful startups that drive economic growth in the region**.

Lazio Innova is **strongly supported by both Regione Lazio and the Camera di Commerico di Roma**. It is the result of the reorganisation process of the companies in the Lazio Region dedicated to innovation and economic development. These initiatives fit into a wider context of talent attraction and retention schemes carried out on national level. Having recognised a significant gap and "brain-drain" trend, the Italian government has established schemes including **sizeable tax breaks** for **Italian researchers** and **academics** returning to work in Italy from abroad for a period of six years, with the possibility of extension to up to 13 if certain criteria are met.

Business support & incubation: the case of Estonia

Estonia has garnered significant recognition for its remarkable success in establishing a robust **business support and incubation framework** that has greatly contributed to driving its innovation ecosystem. Estonia's commitment to nurturing innovation is evident in its comprehensive network of incubators, accelerators, and co-working spaces. These entities provide entrepreneurs with **essential resources, mentorship, and networking opportunities** to transform their ideas into viable ventures. The government's support, along with private sector involvement, has led to the establishment of **specialised incubators** tailored to various sectors such as technology, biotech, and clean energy.

Within the space industry, Estonia established its ESA BIC in late 2017 in order to support start-ups access funding and key expertise as well as transfer technology from space to non-space applications. This targeted approach ensures that startups receive **sector-specific guidance**, enhancing their chances of success and encouraging innovation across diverse fields. ESA BIC Estonia, in collaboration with the start-ups within, has also provided valuable support to diverse **space-tech hackathons and events**.

Since 2022, the Estonian Business and Innovation Agency, born from the merging of KredEx and Enterprise Estonia, has promoted innovation and sustainable business in Estonia. The agency is enhancing **Estonia's prominence and appeal as a hub for business**, residence, and education. It actively draws in foreign investments that bring substantial value and assists in recruiting accomplished international professionals, as well as cultivating the overall startup ecosystem, facilitating sustainable entrepreneurship in the space sector and beyond.

Conferences & events: platforms to spread culture of innovation

Conferences and events boost the international reputation of an innovation ecosystem

Conferences, events and local initiatives support the development of a healthy innovation support ecosystem by providing a platform for knowledge sharing, networking, and collaboration. These events bring together researchers, entrepreneurs, investors, policymakers, and other stakeholders in the innovation ecosystem to exchange ideas, discuss trends, and showcase new technologies and products. By doing so, conferences and events can help to facilitate new partnerships and collaborations, as well as accelerate the commercialisation of innovative ideas.

Conferences, events and local initiatives such as those fostered by InnORBIT also provide a valuable networking opportunity for attendees. They offer a chance to meet potential collaborators, investors, and customers, and to build relationships that can lead to new partnerships and business opportunities. Moreover, conferences and events can help to foster a sense of community within the innovation ecosystem, providing attendees with a platform to share their experiences, discuss common challenges, and find support from others in the industry.

Conferences and events can not only help raise awareness about the importance of innovation and entrepreneurship, but also bolster the international reputation of an innovation support ecosystem. This is particularly important in relation to the ecosystem's attraction capacity, both for new and foreign businesses as well as potential investors. Furthermore, by showcasing innovative ideas and products, these events can inspire and motivate attendees to pursue their own entrepreneurial ambitions. They can also help build support for policies that promote innovation, and create a sense of excitement and enthusiasm about the potential impact of new technologies and ideas on society. More generally, conferences and events support the emergence of an overarching regional or national culture of innovation, periodically attracting diverse international stakeholders to the ecosystem.

Recommendations

1. Support the **organisation of conferences**, **events** and **local initiatives** that focus on key areas of interest for start-ups and are well-aligned with the **national** or **regional space strategy**

   Policymakers can provide financial support, help secure high-profile speakers, and use their influence to attract a diverse range of participants, incl. local and international investors, and industry experts. Further, conferences and events aligned with the overall space strategy, such as the Space Resources Week in Luxembourg, help establish the region's international reputation for specific areas or themes.

2. **Enhance networking** and **collaboration** at events with structured sessions and innovative approaches

   Conferences and events should be designed to maximise networking and collaboration opportunities. This could involve including structured networking sessions in the event programme, creating online platforms for attendees to connect, and providing spaces for one-on-one meetings between start-ups and investors.

3. Leverage initiatives such as InnORBIT to provide support for **both mature and emerging space** innovation ecosystems

   As discussed at the PODIM conference, the versatility of local initiatives such as those within InnORBIT ensures that both less experienced innovation intermediaries and established actors can be supported. Awareness raising activities such as space cafes can help propel new ecosystems towards more complex activities, while mature players can tackle gaps towards stronger systems through local events & initiatives.

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Networks: unlocking global connections & fostering collaboration

Networks connect actors throughout the ecosystem and in the international scene

Innovation support ecosystems rely heavily on the networks established within them and between the various key components of the entrepreneurial ecosystem. These networks can include a variety of players, such as industrial actors, universities, research institutes, businesses, investors, and government agencies, all working together to support innovation. The primary importance of networks lies in their ability to connect individuals and organisations with diverse skillsets, backgrounds, and experiences, creating opportunities for collaboration, knowledge-sharing and cross-fertilisation that can lead to new breakthroughs.

Through networking, individuals and organisations within a space innovation ecosystem can identify new opportunities and form strategic partnerships. For example, a business might connect with a university to form a research partnership, or an investor might encounter and support a start-up looking for funding. Networks also offer access to valuable resources, such as funding opportunities, mentorship, and expertise. For start-ups and entrepreneurs, these resources can be crucial for survival and growth. They can also access mentorship and guidance from experienced business leaders who can provide insights on how to scale their operations and navigate challenges.

In addition to providing resources and opportunities for collaboration, networks also contribute to the overall culture of innovation within an ecosystem. By connecting like-minded individuals and organisations, networks foster an environment of creativity, risk-taking, and experimentation. This culture of innovation can drive progress and create a positive feedback loop, as successful ventures within the ecosystem attract more attention, leading to greater opportunities for collaboration and growth. Leveraging established networks such as ESA BICs can further facilitate connections between diverse players, providing access to resources and fostering an innovation culture.

Recommendations

1. Set up a dedicated **matchmaking programme** for the space sector to **support start-ups**, **scale-ups** and **SMEs** in establishing connections and partnerships with **corporates** and **investors**

Matchmaking programmes provide support and networking opportunities to start-ups, scale-ups and SMEs, connecting them with corporates and investors. Matchmaking efforts should be geared to improving the ability of these companies to attract venture capital funding as well as forming partnerships with key industrial players, thus increasing survival and growth rates.

2. Establish or leverage existing **online networking platforms**, including forums and communities, wherein start-ups, entrepreneurs, partners and investors can interact and connect

Policymakers should look to help the emergence of virtual networks through online platforms, either establishing new ones or encouraging local actors to engage in existing ones. Through tailored initiatives such as those within InnORBIT (e.g., Space Cafes, Investment Tracks, Info Days, etc.) start-ups and entrepreneurs can connect with and engage with companies, research institutions, potential partners and other relevant stakeholders, developing their network of contacts.

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Case studies (4/4)

Conferences & Events: the case of Slovakia

One example of a successful implementation of conferences and events in support of the national space entrepreneurial ecosystem is provided by Slovakia. Through the direct support of both the **Slovak Space Office** (SSO) as well as the **Slovak Investment and Trade Development Agency**, the country has successfully established its **Emerging Space conference** as one of the key events in the CEE region.

Emerging Space is Slovakia's biennial flagship event dedicated to exploring the latest trends in the space sector, with a particular focus on burgeoning ecosystems, stakeholders, and emerging technological frontiers. Its primary objective is to **foster the development of nascent space ecosystems**, enabling them to become significant contributors to the global space community. Originating in 2019 in Košice under the name "Slovak Space Tech Day", the online event held in 2021 drew more than 400 participants. The 2023 edition, held in Bratislava and online, featured **renowned speakers from the space industry**, and successfully attracted a **wide variety of business partners**, from traditional space (ASD-Eurospace, Thales Alenia Space, etc.), NewSpace, and key institutional players (ESA, EUSPA, etc.).

Furthermore, Slovakian institutions have also looked to support their national ecosystem through **Demodays of the Slovak incubator Spaceport_SK**. Such events have played a proactive role in **nurturing the growth of the regional space ecosystem**, stimulating the emergence of new start-ups, business connections, and international partnerships with established players in the space industry.

Networks: the case of Greece

Greece has been very successful in establishing well-developed networks within the space industry, both within the country and internationally. For instance, the **Hellenic Association of Space Industries** (HASI) was set up in 2008 in order to better promote and support the space technology and applications industry.

The overarching objectives of the Association encompass various key aspects. First, there is a strong emphasis on **enhancing communication and collaboration channels** among its members and fostering connections with similar entities, both at the European and international levels, within the space marketplace. Additionally, the Association seeks to **optimise Hellenic involvement in the European Space Agency** (ESA), the national contributions to EUMETSAT, and participation in the Hellenic Ministry of Defence's programmes related to space technologies and applications. Furthermore, it actively **explores potential opportunities for industrial cooperation** arising from these engagements. Lastly, HASI looks to promote cooperation and synergy between the Hellenic Space Industry and various research centres, as well as higher educational institutions, all of which play a crucial role in advancing space-related technological sectors in Greece.

In partnership with Corallia, HASI helped establish the Si-Cluster, the Greek Space Technologies and Applications Cluster. The cluster **targets large companies, defence-related public entities, as well as innovative start-ups and SMEs**, and successfully established close relationships with other networks, clusters, and innovation authorities such as the Madrid Aerospace Cluster, Aerospace Valley, Pole Mer Méditerranée, BavAIRia, and several others.

Innovation is nourished through national space strategies

Space strategies and space innovation ecosystems operate in symbiosis, each supporting the other to reach more ambitious goals

National or regional space strategies set out the overall vision, goals, and priorities for a country's space sector, providing a roadmap for innovation and growth. By defining clear objectives and targets, a national space strategy can guide the development of new technologies, services, and applications that have the potential to transform the space sector and drive economic growth. As such, a space innovation ecosystem is materialised by providing a framework for collaboration and common goals for different stakeholders, influencing the emergence of each of the eight key components and setting the boundaries and conditions for their further development.

Collaborative approaches to both the definition and implementation of a space strategy are needed to ensure its success

Policymakers should take a comprehensive and holistic approach when defining their space strategy in support of innovation. Space strategies do not exist in a vacuum; key stakeholders such as industry leaders, research institutions, start-ups, and entrepreneurs should be engaged to gather insights and perspectives on the existing ecosystem and identify areas for improvement. This collaborative approach ensures that the strategy reflects the needs and aspirations of the stakeholders and encourages ownership and commitment to its implementation.

Policymakers should prioritise measures that foster collaboration, knowledge-sharing, and entrepreneurship within the ecosystem, not only by establishing favourable policy frameworks but supporting each of the other components of a successful space innovation ecosystem. This includes initiatives such as establishing innovation hubs or incubators, creating funding mechanisms specifically targeted at space startups, and facilitating partnerships between academia, research institutions, and industry. By nurturing an environment that encourages cross-pollination of ideas, facilitates access to funding and resources, and supports the development of entrepreneurial skills, policymakers can catalyse the growth of a robust and dynamic space innovation ecosystem, positioning the country or region at the forefront of space commercialisation.

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