Austrian Space Strategy 2030+

People, Climate and Economy:
Space is for EVERYONE

Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology

Austria in Space
The Platform for Austrian Space Activities

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Preface

Space equals innovation and creates future-proof jobs. Space is also a key driver of technology and makes an important contribution to the implementation of Austria's ambitious aim to become climate-neutral by 2040.

Satellite-based data and services are making it possible to digitally map our Earth more accurately and precisely than ever before. They allow us to better measure and understand climate change and help protect us from natural disasters and other potential threats.

Not only is space technology our "eye" to view Earth from space; it also helps us explore the solar system and its planets.

Our aim in presenting this space strategy is to more deeply anchor sustainability on Earth and in space and to strengthen the Austrian space sector and help it remain globally competitive.

This, in turn, will create value added in Austria.

Mutual inspiration and increased synergies between the space and non-space sectors should ultimately open up new business opportunities and promote solutions for a climate transformation and healthy environment.

Leonore Gewessler,
Federal Minister
for Climate Action, Environment, Energy, Mobility, Innovation and Technology

Left: Vienna, taken by Copernicus Sentinel-2A

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Left: The Mystic Mountain formation in the Carina Nebula (NASA/ESA/M. Livio and Hubble 20th Anniversary Team (STScI))

1. Global Development of the Space Sector

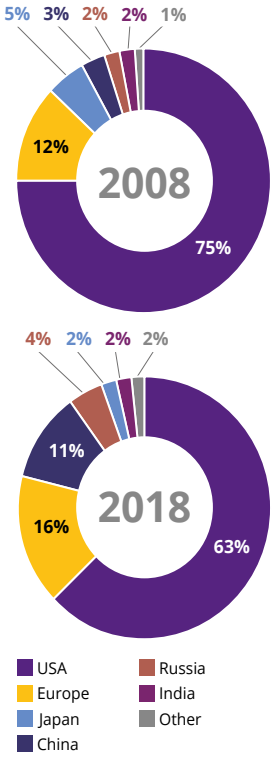

Figure 1: Public spending

Whether they realise it or not, billions of people use technology and services from space every day: Weather forecasts, television, telecommunications and satellite navigation systems are just a few examples.

Experts rely on space technology in many important areas including security applications and monitoring the climate, environment and ecosystem.

As space has become increasingly important in modern life, the international space sector has become highly dynamic and competitive and in recent years has seen an increase in investments

The public sector remains the main source of investment. Globally, US$87 billion in public funding was spent on space activities in 2019.[1] Public sector investment in Europe rose four percentage points between 2008 and 2018 (see Figure 1).

At the same time, however, new markets have emerged outside of traditional space organisations like the National Aeronautics and Space Administration (NASA) in the United States, the European Space Agency (ESA), the Roscosmos State Corporation for Space Activities in Russia, and the Japan Aerospace Exploration Agency (JAXA).

New Space and Space 4.0: public-private partnerships in space

"New Space" refers to the commercialisation of the space sector, most notably greater investment by private actors, a growing number of public-private partnerships, and new business models and procurement strategies. Private actors play an important role in this new ecosystem and are aiming to make spaceflight a business that operates independently of political objectives.
ESA has also coined the term "Space 4.0", which refers to a new, increasingly connected and participatory space age.

Space 4.0 and New Space are promoting and increasing interconnectivity among the scientific community, industry, government and society.

Private investments in spaceflight were higher than ever in 2020, despite the economic crisis caused by the pandemic.[2] The private sector's interest in space is growing, and new areas of business and fields of application are continuously emerging. This development is known as New Space, or Space 4.0.

Substantial growth is expected on the whole. A study by Morgan Stanley predicts that the global space industry will generate no less than USD 1 trillion in revenues in the year 2040. Revenues are expected to double from US$350 billion in 2020 to some US$600 billion by 2030.[2]

Figure 2 on the right shows how the space market is divided among the different segments.

The satellite industry in context
(2019 revenues worldwide, in billions of US dollars)

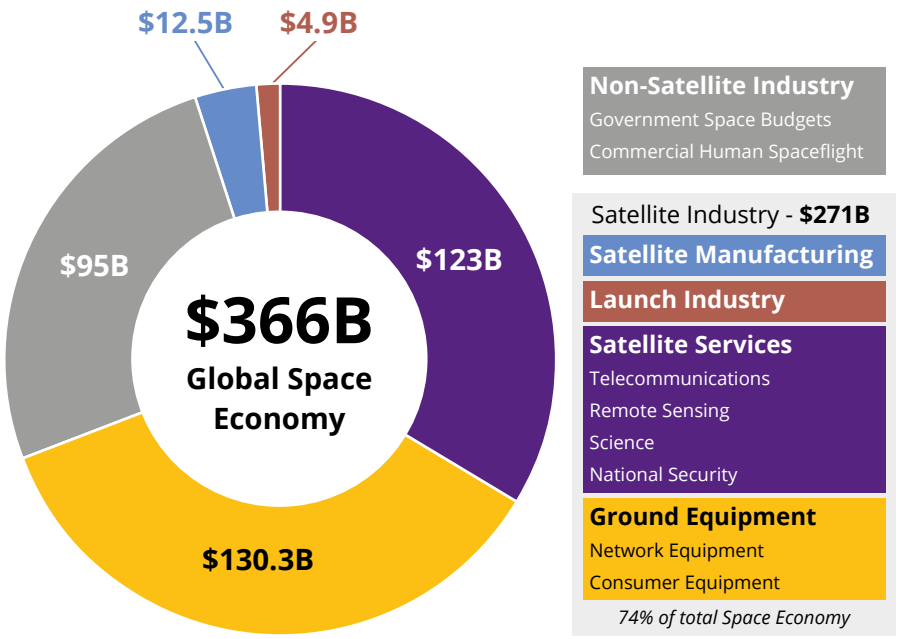

Figure 2: Market segments in the global space industry

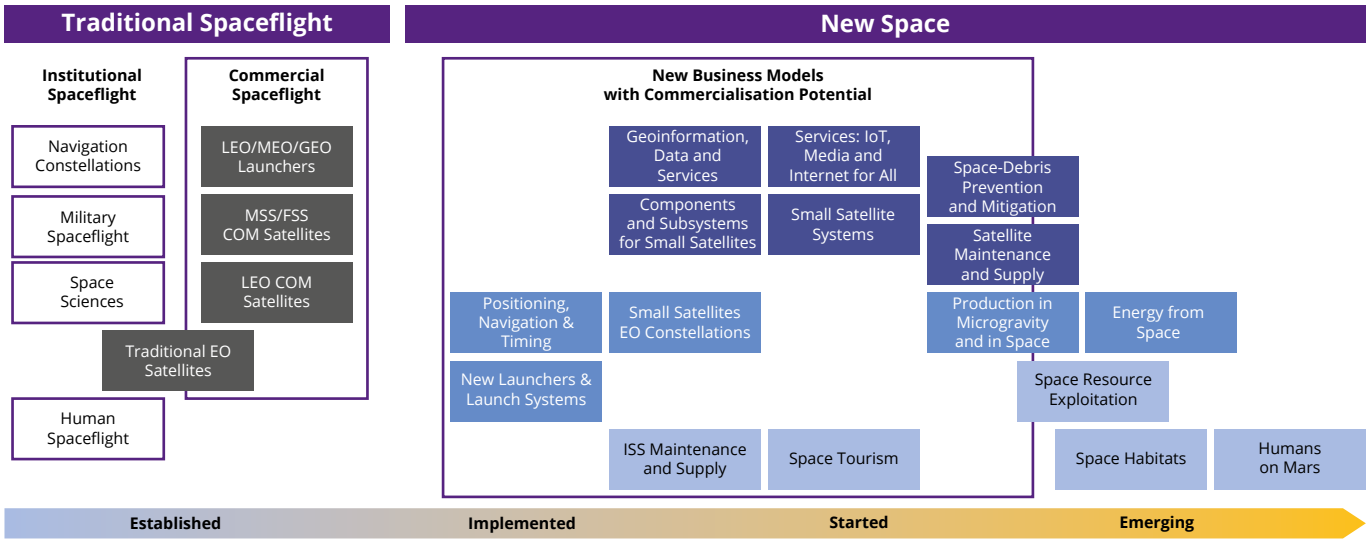

Figure 3: Transformation of space activities

New Space is also bringing a shift in the focus of the space sector. The following chart compares traditional spaceflight with New Space, showing the extensive transformation process that is currently taking place (Figure 3).

New areas of application for the space sector are arising continuously in combination with innovative technologies such as big data, artificial intelligence (AI), 5G connectivity and the Internet of Things (IoT) (Figure 4). The use of new technologies and commercialisation will continue to shape the space sector through to 2030, changing the structure of the entire ecosystem.

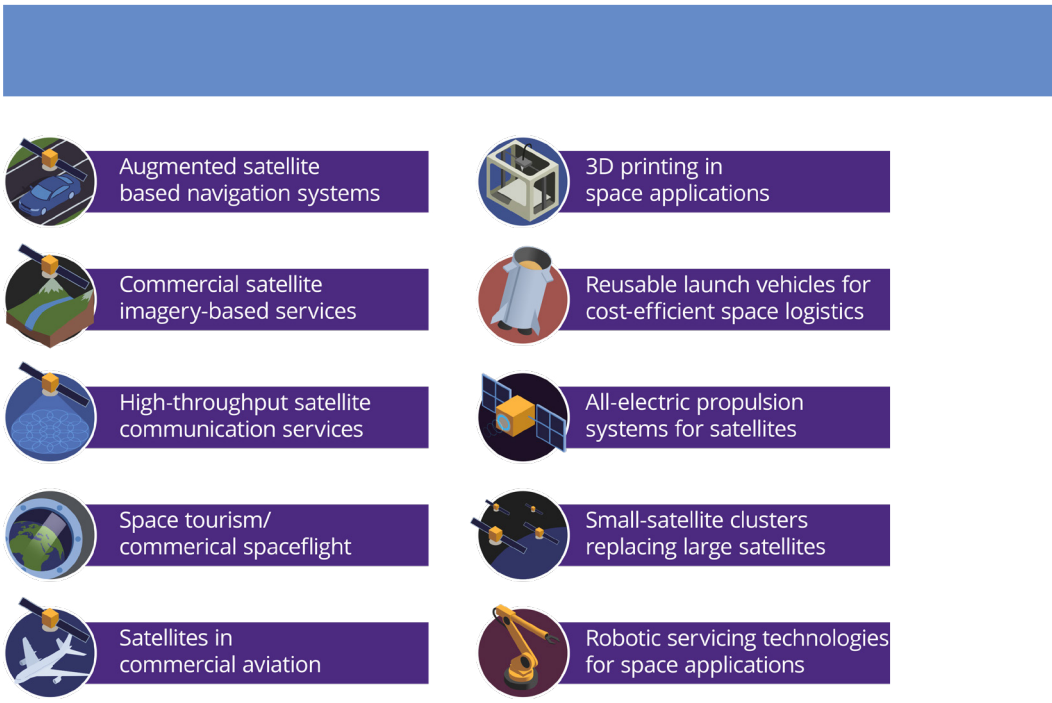

Figure 4: The ten most significant trends in the space sector through to 2030

This development can be seen clearly in the number of satellites integrated into New Space business models as a product themselves and as data suppliers. In only a decade, the number of countries with at least one satellite in orbit rose from 50 in 2008 to 82 in 2018.[3] In 2015, 172 satellites weighing less than 500 kilograms were launched. According to a study by PricewaterhouseCoopers (PwC), the number of these smallsats is expected to increase to 737 by 2025 and to almost 900 by 2030, as shown in Figure 5.

This development will also lead to an increase in objects in space.
The number of satellites in operation rose to 1,848 between 2010 and 2020, nearly a three-fold increase.[4]
A large share of the currently operating satellites and especially future satellites are from private investors and actors and serve commercial purposes

Smallsats (< 500 kg) from single missions and constellations to be launched from 2011 to 2030

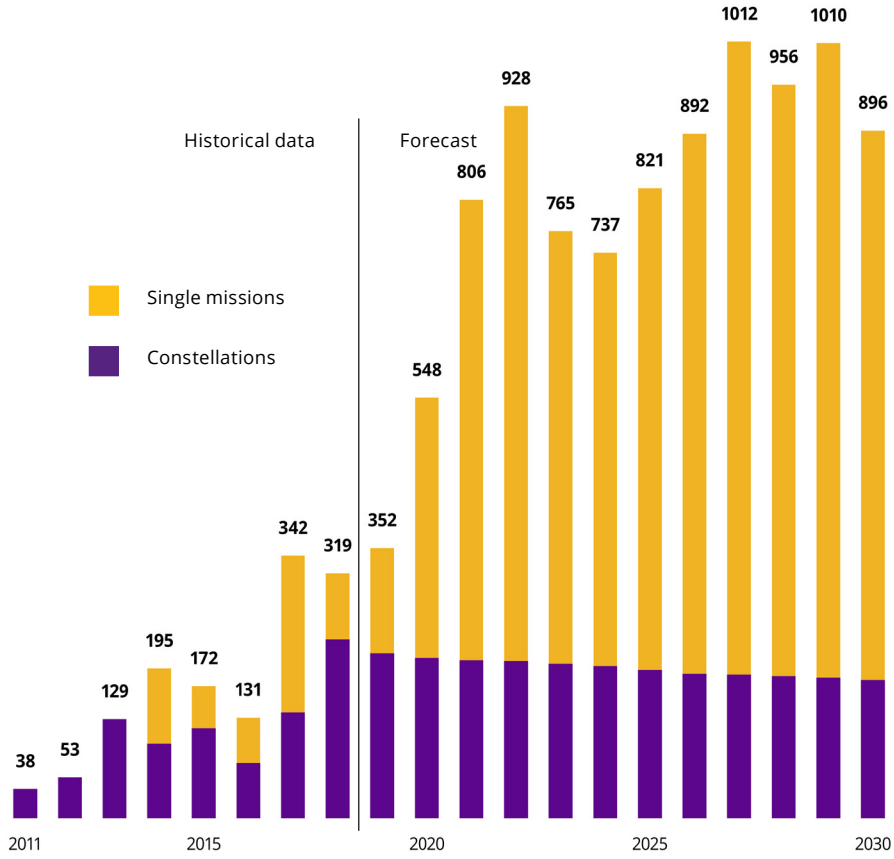

Figure 5: Number of smallsats

2. Europe Is Repositioning Itself

If Europe is to continue occupying an important position in the highly competitive space sector, strategic, economic and political efforts will need to be stepped up.
The challenge for Europe is to find out how to respond to the substantial competitive pressure and changes in the space sector and to take a clear and strong position on space policy. Otherwise, Europe risks losing importance (see Figure 6, p.12–13).

Europe has the chance to position itself as a leader in the space sector with a clear focus on specific disciplines.

One of the key approaches here will be to use space activities to address the major environmental, economic and social challenges of the 21st century and ensure a more sustainable future for the benefit of everyone.

The goal is for space technologies and their deployment to become key enablers for sustainable development.

Space technologies will play an important role in implementing the European Green Deal, reaching the European climate targets such as climate neutrality by 2050, and reaching Austria's target of becoming climate-neutral by 2040.

The European Union (EU), ESA and Organisation for Economic Co-operation and Development (OECD) consider the space sector an increasingly important driver of innovation and economic growth, in particular as part of the digitalisation of the economy.[5]

The European Commission and ESA are both committed to significantly reinforcing the space sector in Europe and using space to achieve sustainability objectives:

"The EU and ESA must, and will, work hand in hand to make sure we are responding to the challenges ahead of us."

Thierry Breton and Josef Aschbacher

Austria's space landscape fits into this European context and plays a major role in particular in sustainable development, both in Earth observation and communication and as a base of international space institutions.

The EU and ESA are building on a foundation of cooperation, security and sustainable development

The October 2016 **joint EU and ESA statement on a shared vision and goals for the future of Europe in space** set strategic goals that aim to maximise the integration of space into society and the economy in Europe, foster a globally competitive European space sector and ensure European autonomy in accessing space.[6]

Similar objectives can be found in the **Space Strategy for Europe by the European Commission,**[7] which sets the following four goals:

- Maximising the benefits of space for society and the EU economy.
- Fostering a globally competitive and innovative European space sector.
- Reinforcing Europe's autonomy in accessing space and using space in a secure and safe environment.
- Strengthening Europe's role as a global actor and promoting international cooperation.

ESA's Agenda 2025 from April 2021 includes the following objectives, which will be important for maintaining and expanding Europe's role in the space industry in the medium and long term:[8]

- Strengthening ESA-EU relations to address society's changing needs.
- Boosting commercialisation for a green and digital Europe. This includes more dynamic and faster collaboration with startups and companies so that they can contribute to a green and digital future.
- Developing space for safety and security to allow Europe's citizens to continue to use space services, communications and data.

World Government Expenditures for Space Programmes

Spending in Millions of US Dollars

Comparison from 1990 - 2020

1990 - Total $29,2 Billion

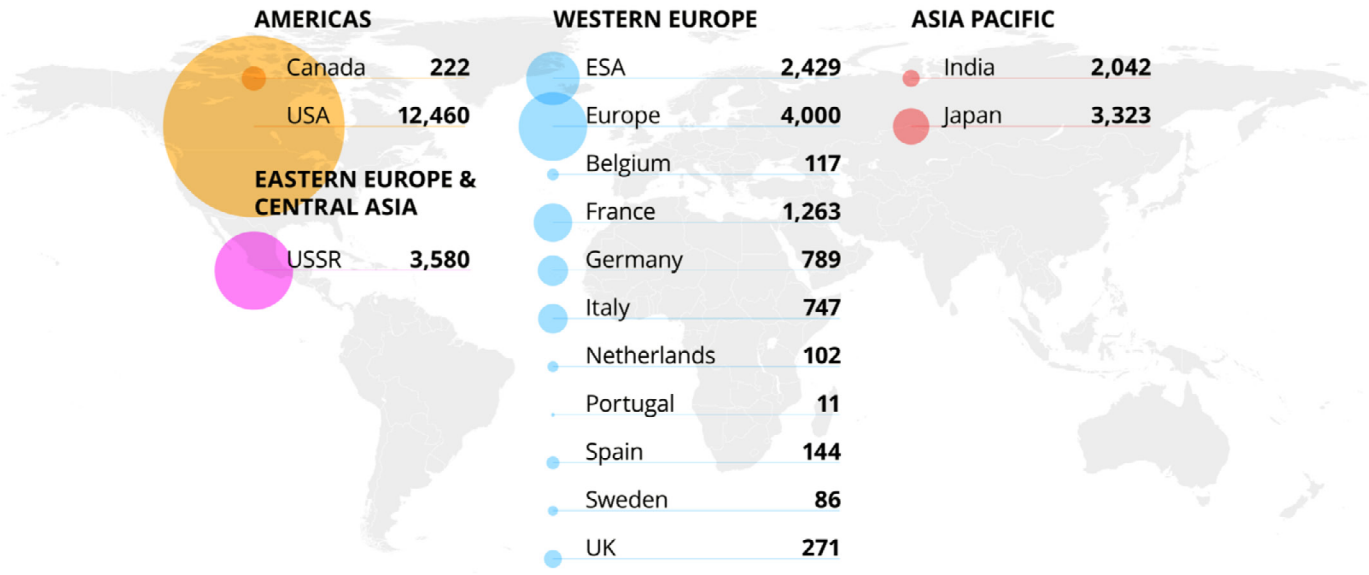

Figure 6: A growing number of countries are investing in space (1990)

Only countries with a budget of at least $10 Million appear on the map.

Budgets indicated for European countries include their contributions to ESA and EUMETSAT.

2020 - Total $82.5 Billion

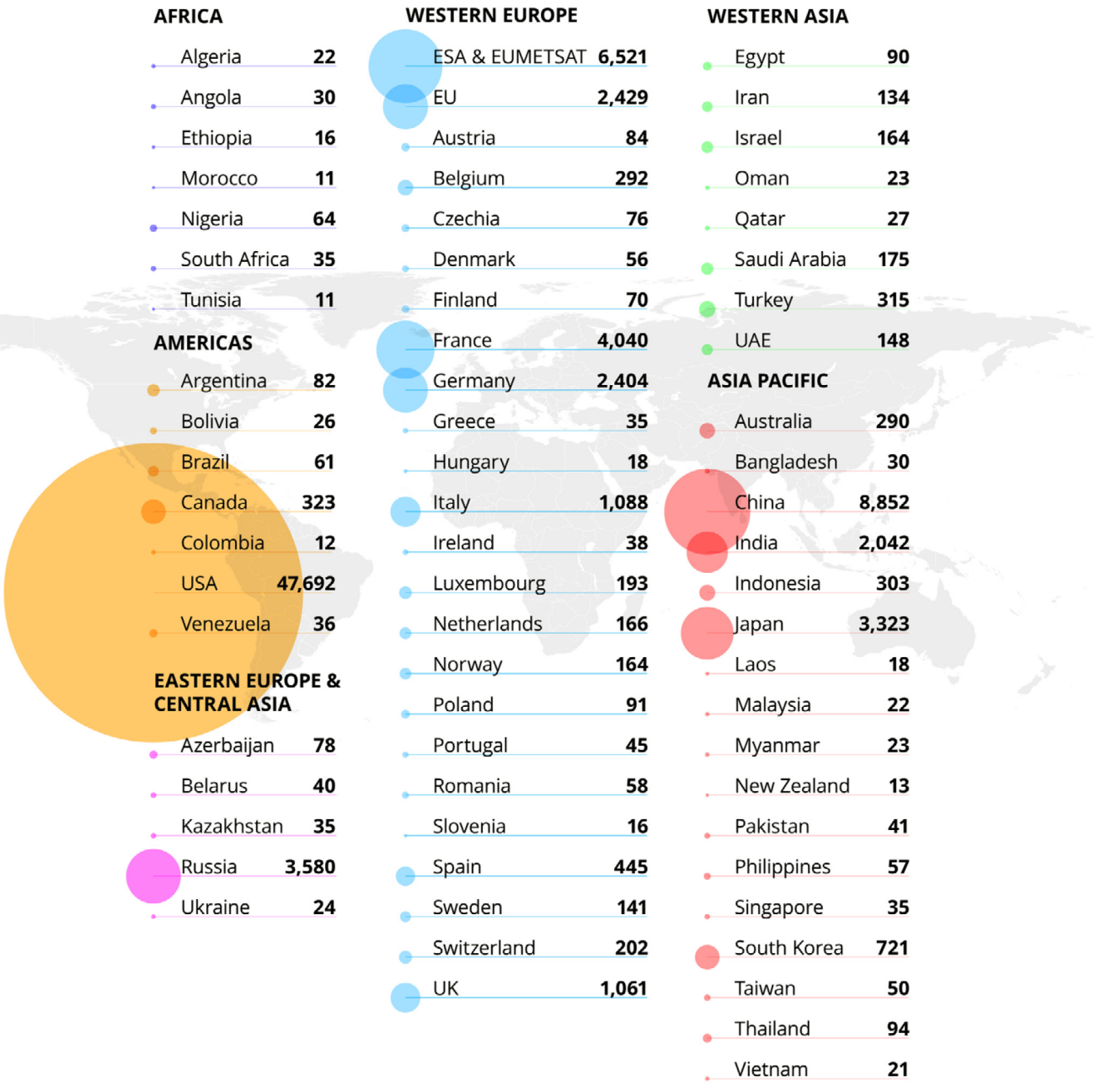

Figure 7: A growing number of countries are investing in space (2020)

3. Initial Position in Austria

The space sector has a future in Austria; the space sector is the future. On the one hand, Austria is building on its diverse space activities in the past and on a well-established community of actors; on the other hand, the new economic dynamics and a focus on sustainability provide Austria with major opportunities to develop its profile in space.

"Space-based Earth observations are indispensable for carbon monitoring. Their worldwide cross-border view is useful for verification of carbon stocks in forests, as well as for monitoring major sources of greenhouse gases and monitoring methane leaks. (...) Copernicus serves high level political objectives like the Paris Climate Agreement. ESA, together with its partners, is already carrying out various carbon related activities. ESA satellites support decision makers in developing policies and action towards net zero emissions."[9]

Josef Aschbacher
Director General of ESA

Austria has established specific areas of expertise and a leadership role in multiple technologies, both of which are crucial for participating in international value-added chains. Austria's space landscape is characterised by a highly competitive supplier industry with dynamic small and medium-sized companies, a growing number of startups, and established research institutions. (For more information on the space sector in Austria, see Austria in Space).[10]

The Austrian Space Applications Programme (ASAP), which was established in 2002, plays an important role in this. The ASAP facilitates collaboration with ESA and the EU and in the commercial space market, making it crucial for Austria's space sector.
Furthermore, the ASAP is the central element for the development of space applications in Austria.

Since 2002, the ASAP has funded some 800 projects with a total budget of around EUR 130 million.
Thirty per cent of projects that received funding from the ASAP resulted in an ESA project, nearly twenty percent in an EU research programme, and twenty-five per cent in a contract on the commercial market.

Austria's commitment to space covers a diverse range of activities. Its participation in ESA programmes, one of the pillars of Austrian space activities, as well as its involvement in the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and the EU's space initiatives and programmes are especially relevant for the national space sector.
In the case of EU initiatives and programmes, structural partnerships focused on specific topics are now also planned in addition to bottom-up activities.

As the site of the United Nations Office for Outer Space Affairs (UNOOSA) and the European Space Policy Institute (ESPI), Austria is a hub for space diplomacy, policy and law. Austria also has an ESA Business Incubation Centre (BIC) in Graz and Wiener Neustadt and a European Space Education Resource Office (ESERO) in Linz and is a member of the ESA Innovation Partner Network and Business Applications Ambassador Network.

Alongside Austria's participation in missions at the European and international level, an important part of its space-based activities focuses on the benefits for society. Space-based data and services offer significant benefits for sustainable policy-making and innovative solutions in fields such as climate protection and environmental monitoring, land use, renewable energy, mobility, weather and disaster management. In addition, space helps foster the green and digital transformation of our society and economy.

For this reason, the Austrian space sector and its framework are influenced by a number of strategic objectives from other areas. Austria's 2020–2024 government programme addresses climate neutrality by 2040 and solutions for global challenges through research and innovation. While climate protection is the top priority, sustainability overall is also especially important: "Environmental protection and a strong economy must not be contradictive.
Our business location can become even more dynamic, we can create more and better jobs, if we invest in sustainability."[11]

The government's strategy for research, technology, and innovation for 2030[12] stresses internationalisation, expansion of European and international partnerships, and above all the use of research, technology, and innovation (RTI) to achieve climate targets.
The space sector can play a major role here. The strategy stresses the following climate-related measures in particular:
Developing key technologies to improve climate protection, promoting cooperation and implementation of holistic solutions across sectors (such as the construction and energy sector and mobility), expanding relevant data acquisition activities and the use of digitalisation, and facilitating networking among the relevant actors.

Space data and services play an important role in conjunction with the 2030 Mobility Master Plan and implementation measures in the RTI Mobility Strategy,[13] in the implementation of Austria's energy research strategy, and in the implementation of the government's goal to make Austria climate-neutral by 2040.

Based on its initial position and international and national objectives, Austria must address the following strategic questions relating to the development and positioning of the space sector through to 2030:

- How should Austria position itself in the **dynamic European and global environment**?
- How can Austrian space activities **best support sustainability targets**?
- How can **Austria's current expertise and strengths be improved further**?
- **How will Austria position itself in New Space**?
- How can actors from **other sectors be brought into the space sector** and how can we strengthen **collaboration among different areas**?
- How can we reinforce Austria's role as a **space diplomacy location**?

Highlights from Austria's Long History in the Space Sector

1950
Start
of space research at Austrian institutes

1959
Co-founding
of the UN Comittee on the Peaceful Uses of Outer Space (UNCOPUOS) by Austria

1968
Space conference
UNISPACE in Austria, followed by others in 1982, 1999 and 2018

1969
Commitment
of Austria in the Apollo missions

1970
Foundation
of the Institute for Space Research of the Austrian Academy of Sciences

1972
Foundation
of the Austrian Space Agency (ASA), the predecessor organisation of the Aeronautics and Space Agency (ALR) within the FFG

1975
Participation
in programmes of the European Space Agency (ESA)

1987
Austria
gains full ESA Membership

1991
First "Austronaut"
Austrian Franz Viehböck arrives on Russian space station MIR

1993
Admission
of Austria to the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)

1994
Establishment
of the headquarters of the United Nations Office for Outer Space Affairs (UNOOSA) in Austria

1998

Maiden flight
of Ariane 5 with Austrian technology on board

2001

Space law
in Vienna: Foundation of the National Point of Contact (NPOC) for the European Centre for Space Law (ECSL)

2002

Start
of the national space programme Austrian Space Applications Programme (ASAP), which funded around 850 projects until 2020

2004

Foundation
of the European Space Policy Institute (ESPI) in Vienna

2005

FFG Advisory Council
for Aerospace begins work

2011

Start
of the first Galileo satellites, utilising Austrian technology on board

Adoption
of the Federal Act on the authorisation of space activities and the establishment of a of a Space Registry (Space Act)

2013

Start
of the first two Austrian satellites TUGSAT-1 / UNIBRITE

2014

Foundation
of the Earth Observation Data Centre (EODC)

2016

Foundation
of the ESA Business Incubation Centre (BIC) in Graz and Wiener Neustadt

2017

Start
of the third Austrian satellite PEGASUS

2018

UNISPACE+50
conference in Vienna

2019

Start
of the fourth Austrian satellite OPS-SAT

First
UN/Austria World Space Forum in Vienna

For the first time
Austrian technology is involved in a mega constellation

2020

Election
of Austrian Josef Aschbacher as ESA's new director general

Figure 8: Highlights from Austria's long history in the space sector

4. Vision for Austria's Space Sector for 2030+

2030.
People, climate and economy: Space is for EVERYONE

The strategic questions were used to develop a vision of how Austria is to develop its space activities through to the year 2030 and beyond.

In 2030, Austria will be recognised internationally for its global profile as a pioneer in using space for comprehensive sustainability, in particular in climate and environmental protection. Satellites with technology made in Austria will provide information about the condition of Earth, and data from space will help further the green and digital transformation of our society and economy. Space will be an integrated component of our everyday lives and a source of fascination for researchers and scientists.

Austria will have a thriving space ecosystem in 2030. Actors from various disciplines, industries, scientific fields and the public sector will collaborate extensively.

The number of actors and areas of expertise will have grown considerably. With their technologies and products, Austrian high-tech companies and innovative startups will be an indispensable part of international value-added chains in the establishment and operation of space infrastructure and in the provision of applications and services in the year 2030.

This will translate into a continuous supply of new, high-quality jobs in Austria.

In 2030, Austrian scientists will have expanded our knowledge about the universe, solar system and Earth by publishing papers that set international trends.

Thanks to Austria's appeal as a location for the space sector in 2030, many talented young people will get excited by space and STEAM fields (science, technology, engineering, arts and mathematics).

In 2030, jobs in the space sector will be highly sought after by young people, and the sector will be open and diverse in terms of gender equality, origin, and social and thematic diversity.

In 2030, Austria will have greatly strengthened its locational advantage as a neutral hub for international space policy and diplomacy. Austria will be a leading venue for European and international exchange and consensus-building on sustainability in space and in the space industry.

In 2030, the Austrian public will be well informed about the importance of space technology for daily life and the national space activities. Discussions of space issues will be part of cultural life in Austria.

2030.
When people think of sustainability and space, they will think of Austria.

5. Strategic Targets and Measures through to 2030

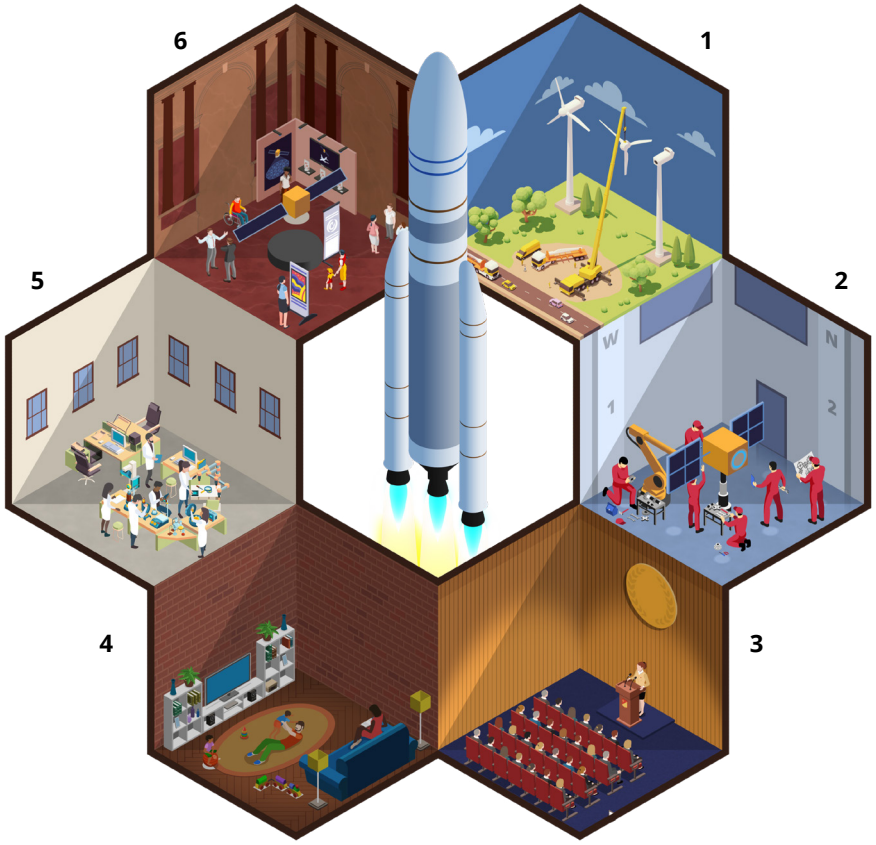

Figure 9: System for the evolution of the Austrian Space Strategy 2030

We have set the following six targets based on the vision:

1. **Sustainable development on Earth and in space**
2. **A competitive space sector with a high degree of value added and sustainable jobs in Austria**
3. **Scientific excellence in space and Earth research**
4. **Space for all areas of life**
5. **Talent and diversity for space**
6. **A public dialogue on space**

Subtargets and measures that fall under the responsibility of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) will be defined for each of these targets. They will be expanded over the course of implementation.
Figure 7 shows the relationships between the targets.

Target 1

Sustainable Development on Earth and in Space

2030.

Austria is a pioneer in supporting sustainable development on Earth and in space and is recognised for its commitment at the national, European and international level. Austria uses its wide range of expertise and clearly demonstrates how space technologies and their deployment can help reach the goal of sustainability.

Environmental, economic and social sustainability includes the Federal Government's climate targets, the UN's 2030 Agenda and the 17 Sustainable Development Goals (SDGs), including Climate Action (SDG 13), and the UN Guidelines for Long-term Sustainability of Outer Space Activities, including space traffic management and the prevention of space debris.

2030 subtargets

The Austrian space sector contributes to the green and digital transformation on Earth and in space with its products and services.

Austria's commitment at the international level contributes to ensuring that the space sector facilitates sustainable development on Earth and in space.

Austria's space expertise helps to ensure that climate targets are met and monitored.

Actors in Austrian space activities have set sustainability targets in their organisations and for their products and services.

Measures

Sustainability indicators will be developed and applied to assess and appropriately steer Austrian space activities in ESA and at the national level.

Austria will advocate for the development of a quality seal for sustainable companies in the space sector and will develop a roadmap for this.

A roadmap for a European Office of Space Commerce located in Austria will be developed, and implementation of the roadmap will be pushed forward.

"Space and sustainability" will be established as a core topic at the ESPI.

Austria will advocate for the sustainable use of space in the context of space diplomacy at the United Nations level (including the World Space Forum).

Austria will advocate for greening European and international space law and will ensure implementation at the national level.

Target 2

A Competitive Space Sector with High Value Added and Sustainable Jobs in Austria

2030.

The Austrian space sector is highly innovative and an essential part of international value-added chains.

New and established companies and research institutes in Austria are increasingly developing new products and services for satellites, launch systems and ground infrastructure for the European and international market with a clear competitive edge in terms of performance and cost. Austrian research institutions and companies make technological contributions to exploration activities.

Austria has further expanded its specific expertise and role as a technology leader and is strengthened as a business location. Austria is highly competitive internationally and has created highly qualified jobs.

2030 subtargets

Austrian companies have increased their share of international, institutional and commercial value-added chains thanks to their competitive products and services.

Austrian companies and research institutions are highly involved in the EU's space programme, the Horizon Europe research programme and other relevant EU programmes.

The Austrian space sector takes advantage of opportunities made possible by technology transfer; synergies between upstream, midstream and downstream activities; and interdisciplinary and transdisciplinary cooperation with national and international companies and research institutions in order to establish new expertise and new business models.

Austrian companies are attractive for investors.

The Austrian space sector has essential infrastructures for testing materials and components for use in space at dedicated laboratories and for accessing and processing space data.

New Space makes up a significant percentage of Austria's space activities.

The Austrian space sector creates highly qualified jobs.

Measures

Austria will sign on to relevant optional ESA programmes and enable funding for the national ASAP space programme to create the potential for the space sector to grow (including participation in EU programmes).

The ESA Business Incubation Centre (BIC) will be expanded to include additional locations in Austria.

Funding will be developed and used for in-orbit demonstration/validation (IOD/IOV) to help Austrian companies test technology in space.

An Austrian Space Award competition for new and innovative business models (including areas such as additive manufacturing, artificial intelligence, cybersecurity, quantum technologies, robotics and climate tech) will be launched.

The Austrian space sector will increasingly collaborate with Austria's diplomatic missions abroad.

A networking platform will be established to connect companies and research institutions with investors (including for mentoring purposes).

Target 3

Scientific Excellence in Space and Earth Exploration

2030.

Austria has further strengthened its commitment to space science (such as astronomy, astrophysics, planetary sciences and space weather), exploration and space-based geoscience in international comparison.

The BMK Strategy for the Austrian Space Sector complements the Austria-wide university development plan, the corresponding development plans at the universities and the performance agreement with the Austrian Academy of Sciences.

2030 subtargets

In the field of space sciences and exploration, Austria participates in missions that are highly significant for science and secures early access to scientific data by participating in the development of scientific flight instruments (payload).

Austria has advanced its profile in space-based geosciences in line with its expertise and has expanded its leading international role in specific areas.

The number of pioneering and highly impactful papers published in renowned journals has increased considerably and publication activities at least match those of countries comparable to Austria.

Measures

Austria's expertise in space sciences and exploration will be strengthened through the ASAP and involvement in relevant ESA programmes and international missions.

Austria's expertise in space-based geosciences will be strengthened through the ASAP and involvement in relevant ESA programmes; cooperation between the scientific and business communities will play an important role here.

Target 4

Space for All Areas of Life

2030.

The data and signals generated by weather, Earth observation, telecommunication and navigation satellites are an essential part of daily life for everyone in Austria. Services based on this data and these signals have a high level of service quality and reliability and are easy to obtain and use.

Space-based data and services offer significant benefits for sustainable policy-making and innovative solutions in fields such as climate protection and environmental monitoring, land use, renewable energy, mobility, weather and disaster management.

Data from space help promote the green and digital transformation of our society and economy.

2030 subtargets

Space-based services and data support the attainment of the climate targets and contribute to the mobility transformation, the energy transformation and a sustainable circular economy.

Space-based services in meteorology, Earth observation, telecommunications and navigation make day-to-day life easier and support public services. In-depth networking between providers of space-based data and services on the one hand and users from different fields on the other as well as vertical integration create value added and jobs.

A large volume of high-quality data is available and used by the relevant actors in the innovation environment, science and business.

The regulatory environment supports the use of space data.

Measures

The use of space data and signals in meteorology, Earth observation, telecommunications and navigation will evolve into products and services for commercial use and will be promoted through Austria's signing on to optional ESA programmes and in the context of the ASAP.

A roadmap for greater use of space-based data and services in meteorology, Earth observation, telecommunications and navigation will be developed, and the implementation of the roadmap will be moved forward. Austrian actors will consolidate their know-how for specific issues relating to sustainability and climate protection that require extensive expertise from different disciplines (such as satellite-based CO2 monitoring).

A digital twin of Austria, which will allow climate and environmental policy measures to be transparently modelled and simulated and which will assist with decision-making, will successively be created in consultation with the European Destination Earth Initiative.

A roadmap for a space application check for consulting on and assistance with the use of space data will be developed and the implementation of the roadmap will be pushed ahead.

High-performance data centres, including data access for Earth observation, will be expanded further.

A roadmap for a "Powered by Space Data" label for space-based services developed in Austria will be created, and the implementation of the roadmap will be pushed ahead.

Target 5

Talents and Diversity for Space

2030.

A sufficiently large talent pool is available to ensure a flourishing and innovative space sector. Diversity is a reality. Austria has expanded the space-related content in its education and training system, and the population is familiar with these offerings.

2030 subtargets

Training opportunities relevant to space are ensured over the long term.

An extensive amount of information about education and training relevant to space is available and the offerings are easy to access.

Openness, gender equality and diversity, including social and thematic diversity, are actively promoted in all areas of the space sector.

Measures

The role of the European Space Education Resource Office (ESERO) in the education and training offerings will be strengthened.

Student space teams will receive support for their activities and projects.

International space education opportunities (such as Summer School Alpbach, the European Centre for Space Law (ECSL) and International Space University) will be widely advertised. Participants from Austria will receive greater support, with special attention paid to gender equality.

The need for an endowed professorship in space technology will be assessed, with implementation as the goal.

Target 6

A Public Dialogue on Space

2030.

Space fascinates and inspires. Persons living in Austria are highly aware of the role and importance of the space sector in day-to-day life.

2030 subtargets

Stakeholders in the space industry interact openly and directly with the general public.

A target group-oriented dialogue on space topics is maintained.

Measures

The Austria in Space website will be expanded and content will be communicated using simple language.

Formats relevant to space (such as Yuri's Night and the Long Night of Research) will be expanded and companies will be involved to a greater extent.

A strategic communication concept, including an implementation plan, will be developed and implemented to communicate the fascination of space and Austria's space activities appropriately for different target groups.

An Art Meets Space competition will be launched as a creative and tangible way to demonstrate the importance of space in everyday life.

Public dialogues on space (citizens' debates) will be established.

Exhibitions on space will be held in public spaces.

6. Implementing the Strategy

The Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) is responsible for implementing the strategy in close collaboration with the Aeronautics and Space Agency (ALR) of the Austrian Research Promotion Agency (FFG). Close cooperation with all of the relevant actors in the public sector and the business and scientific communities will be crucial for making the most of the Austrian Space Strategy 2030 and ensuring its success.

The BMK and FFG/ALR invite all established and new actors in the space sector and other sectors to let themselves be inspired by the strategy.

A monitoring concept with indicators will be implemented alongside the strategy. Periodic implementation reports will be published.
The FFG Advisory Committee will submit statements on these reports and actors in the space community will be consulted so that any necessary adjustments to measures can be made.

The strategy will undergo an interim evaluation, and the implementation of the strategy will be subjected to an external evaluation in 2031. The evaluation should be conducted as a design and process evaluation (measures of the strategy) and, where possible, as an impact analysis. Recommendations for the subsequent strategy period should be made, taking into account the international and European context.

7. Strategy Process and Acknowledgements

The Austrian Space Strategy 2030 was developed in 2020/21 through an open innovation process of the BMK held over several months in collaboration with FFG/ALR and with the involvement of relevant experts. Experts from winnovation consulting gmbh provided support throughout the strategy process.

Development of the vision for 2030

More than 30 interviews of national and international experts and thought leaders in business, research and society formed the starting point for the strategy.

These findings were then translated into the groundwork for the Austrian space sector's vision for 2030 during a two-day lead-user workshop. There were a total of 24 participants in the workshop, including six external international and national experts.

National and international experts involved in developing the vision:

- Alain Berry – Business Development Space & Navigation Domain (Orange Business Services), FR
- Gaetan Petit – Co-founder of Space4Impact, CHE
- Marc Elsberg – Best-selling author, AUT
- Mari Eldholm – Director (NIFRO Norwegian Industrial Forum for Space Activities), NOR
- Narayan Prasad – COO Satsearch, NLD/DEU/IND
- Daniel Porras – Director of Strategic Partnerships and Communications, (Secure World Foundation), USA
- Wolfgang Neubert – Partner (APEX Ventures), AUT

BMK experts involved in developing the vision and strategy:

- Margit Mischkulnig: Head of the Space Affairs Department
- Christian Fuchs: Copernicus Earth Observation, Space Technologies, ESA Business Incubation Centre (BIC), Austrian Space Applications Programme (ASAP), Austria in Space website
- Verena Heingärtner: Space Attachée at the Permanent Representation of Austria to the European Union, Brussels
- Andrea Kleinsasser: Deputy Head, UN Space Affairs, ESA International Affairs
- Victoria Katharina Schebek: Horizon Europe – Space, EU Competitiveness Council – Space, ESA Administrative and Finance Committee (AFC), international space law, UNCOPUOS Austria in Space website
- Sven Schneider: Navigation, quantum communications, security, and information security for space
- Lydia Wildt: Space Surveillance and Tracking (SST), Governmental Satellite Communications (Govsatcom), EUMETSAT, European Space Policy Institute (ESPI), Austrian Outer Space Act

FFG/ALR experts involved in developing the vision and strategy:

- Andreas Geisler: Head of the Aeronautics and Space Agency
- Luc Berset: Telecommunications, Earth observation, space technologies
- Elisabeth Fischer: Navigation, ESA Administration and Finance Committee (AFC), ESA Business Incubation Centre (BIC)
- Thomas Geist: Earth observation, Horizon Europe – Space
- Michaela Gitsch: Education and training activities, space PR
- Daniel Jokovic: Austrian Space Applications Programme (ASAP), exploration
- Stephan Mayer: Security in space, technology development, Horizon Europe – Space, UN Space Committee
- Elisabeth Klaffenböck: Delegate to ESA and ESA Ministerial Council, industry policy, security in space
- Evelyn Obernosterer-Egger: Treasurer, European Space Policy Institute (ESPI)
- André Peter: Space sciences, astronautical spaceflight, microgravity and exploration, space transport systems
- Matthias Schreitl: Navigation, ESA Business Incubation Centre (BIC)

Text and layout:

- Judith Delany, PERIHELION OG

Public consultation

A draft of the Austrian Space Strategy was subject to an online public consultation from 29 June to 9 July 2021.

A total of 257 people participated in the online consultation, and more than 650 individual comments were made on the vision, targets and measures. These comments were taken into account in the present version.

We would like to thank EVERYONE for their participation in the creation of this strategy.

Annex

Abbreviations

AFC	ESA Administrative and Finance Committee
AI	Artificial intelligence
ALR	Aeronautics and Space Agency
ASA	Austrian Space Agency
ASAP	Austrian Space Applications Programme
BIC	ESA Business Incubation Centre
BMK	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
ECSL	European Centre for Space Law
EODC	Earth Observation Data Centre
ESA	European Space Agency
ESERO	European Space Education Resource Office
ESPI	European Space Policy Institute
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FFG	Austrian Research Promotion Agency
RTI	Research, technology and innovation
IOD/IOV	In-orbit demonstration/in-orbit validation
JAXA	Japan Aerospace Exploration Agency
NASA	National Aeronautics and Space Administration
NIFRO	Norwegian Industrial Forum for Space Activities
NPOC	National Point of Contact for Space Law Austria
OECD	Organisation for Economic Co-operation and Development
ROSCOSMOS	Роскосмос – State Corporation for Space Activities in Russia
SST	Space surveillance and tracking
STEAM	Science, technology, engineering, arts and mathematics
UN	United Nations
UNCOPUOS	UN Committee on the Peaceful Uses of Outer Space
UNOOSA	United Nations Office for Outer Space Affairs

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All figures were adapted for the strategy and made accessible.

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Page 12	5	OECD: The impacts of COVID-19 on the space industry (2020)	https://www.oecd.org/coronavirus/policy-responses/the-impacts-of-covid-19-on-the-space-industry-e727e36f/
Page 13	6	European Commission and ESA: Joint statement on shared vision and goals for the future of Europe in space by the EU and ESA (2016)	http://www.esa.int/About_Us/Corporate_news/Joint_statement_on_shared_vision_and_goals_for_the_future_of_Europe_in_space_by_the_EU_and_ESA
	7	European Commission: Space Strategy for Europe (2016)	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016DC0705
	8	ESA: Agenda 2025 (2021)	https://download.esa.int/docs/ESA_Agenda_2025_final.pdf
Page 16	9	ESA: Josef Aschbacher discusses the future of Earth observation (2019)	http://www.esa.int/ESA_Multimedia/Videos/2019/05/Josef_Aschbacher_discusses_the_future_of_Earth_observation
	10	Austria in Space: Space Industry and Research Directory	https://austria-in-space.at/en/organisastions/

Page 17	11	Austrian Federal Government: Out of a Sense of Responsibility for Austria. Government Programme 2020 – 2024 (2020), Preamble, p. 5	https://www.bundeskanzleramt.gv.at/dam/jcr:d7057356-8c6d-4fb3-ab9f-7bc14ff3d871/GovProgramme-Short_EN_BF.pdf
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	13	BMK: RTI Mobility Strategy (2020)	https://mobilitaetderzukunft.at/resources/pdf/broschueren/BMK_FTI_Strategie_Mobilitaet_ENG_barrierefrei.pdf

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