

Germany Space Sector Study



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Ariennir gan
Lywodraeth Cymru
Funded by
Welsh Government

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Executive Summary



This report examines Germany’s space sector in order to identify areas of strategic strength, development need, and practical opportunity. It is intended to support readers seeking to understand where Germany offers credible opportunities for collaboration, foreign direct investment, and export, and where targeted engagement could help generate practical value for UK and Welsh stakeholders. As a standalone report, it sits within the wider Welsh Government Agile Cymru-funded activity designed to strengthen Wales’ international links with Germany, particularly Baden-Württemberg, while providing a clearer evidence base for future engagement.

Within that context, the Germany-focused analysis serves both a project-specific and a wider strategic purpose. At project level, it supports the effort to strengthen Wales’ international positioning by providing a clearer evidence base on the German ecosystem as a basis for collaboration, trade, and inward investment. More broadly, it offers value to UK stakeholders by improving understanding of one of Europe’s most significant space economies, helping industry, policymakers, and investors identify where Germany’s strengths, priorities, and capability needs may create opportunities for UK engagement. Explicitly, it supports implementation of the Wales – Baden-Württemberg Shared Statement of Cooperation and the UK – Germany Kensington Treaty by providing a clearer evidence base for future engagement (Welsh Government, 2023; UK Government, 2025)^{1,2}.

¹ Welsh Government, 2023. Wales strengthens cooperation with German state of Baden-Württemberg through signing of a joint declaration. [Online] Available at: <https://www.gov.wales/wales-strengthens-cooperation-german-state-baden-wurtemberg-through-signing-joint-declaration> [Accessed 26th March 2026].

² UK Government, 2025. Treaty between the United Kingdom of Great Britain and Northern Ireland and the Federal Republic of Germany on friendship and bilateral cooperation. [Online] Available at: <https://www.gov.uk/government/news/treaty-between-the-united-kingdom-of-great-britain-and-northern-ireland-and-the-federal-republic-of-germany-on-friendship-and-bilateral-cooperation> [Accessed 26th March 2026].

The analysis shows that Germany is one of Europe's major space powers, but that its profile differs from more commercially service-led ecosystems. Germany's strength lies in the depth of its engineering base, research infrastructure, manufacturing capability, and long-standing role within European cooperation. Its space story is defined by sustained leadership in technically demanding roles, including manufacturing, mission operations, scientific payload development, and major contributions to ESA and EU frameworks. In the 2020s, this established position has increasingly been reframed around resilience, sovereignty, secure infrastructure, and NewSpace competitiveness.

The report also finds that Germany's strategic direction is clearly articulated through two documents: the 2023 Federal Government Space Strategy and the 2025 Space Safety and Security Strategy. Together, these set out an integrated agenda spanning European and international cooperation, NewSpace and growth-market development, climate and environmental monitoring, digitalisation and downstream data infrastructure, sustainability and safe use of space, scientific research, exploration, skills, and security. Germany, therefore, presents as a highly capable and strategically serious ecosystem, with priorities that connect industrial competitiveness, public-interest applications, and national resilience.

Introduction

This report provides an overview of Germany’s space sector, its strategic direction, and the principal areas in which it shows both strength and development need. Its purpose is to help identify areas where Germany presents meaningful opportunities for collaboration, foreign direct investment, and export. It is intended for readers seeking to understand where German organisations, institutions, and industrial capabilities already offer strong potential, where Germany is prioritising future growth, and where engagement with the German ecosystem may provide practical value.

This standalone report sits within a wider programme of activity supported through Welsh Government Agile Cymru funding. That project was designed to strengthen links between Wales and Germany in the space sector, building on the relationship with Baden-Württemberg and using engagement activity, ecosystem mapping, and analysis to support future collaboration, trade, and inward investment. Within that wider programme, the Germany-focused work has a dual value: it helps support a Wales-facing international partnership, but it also provides wider UK stakeholders with clearer market intelligence on Germany as one of Europe’s most important space economies. This supports the implementation of the Wales – Baden-Württemberg Shared Statement of Cooperation and the UK – Germany Kensington Treaty by providing a clearer evidence base for future engagement^{1, 2}.

Germany is particularly well suited to this kind of analysis because of the character of its space ecosystem. Its development has been shaped by a combination of industrial depth, research capability, and sustained participation in European programmes, rather than by a single highly visible national model. From early satellite milestones and Spacelab through to its embedded role in ESA, Galileo, Copernicus, and human spaceflight manufacturing, Germany has built a mature and broad-based space economy spanning upstream manufacture, research infrastructure, and downstream applications. More recently, that legacy has been reframed in response to NewSpace conditions, geopolitical instability, and the growing importance of secure and resilient space-enabled services.

The report is structured around that logic. It first outlines Germany’s space story and the conditions that have shaped its current position; it then examines the strategic priorities set out in the Federal Government Space Strategy and the Space Safety and Security Strategy, which together provide the clearest account of Germany’s intended direction to 2030; finally, it considers the extent to which current ecosystem capability aligns with those priorities, identifying both the areas where Germany already has a strong offer and the areas where further development is needed if it is to secure stronger long-term advantage.

The report should be read as an opportunity-identification document rather than simply a sector profile. For industry, it can help indicate where German capabilities may be relevant to customers, suppliers, and international partners, and where UK firms may be well placed to complement German strengths or address German needs. For investors, it can help identify domains where Germany has substantial technical and industrial credibility but would benefit from stronger commercial scaling, operational models, or downstream market expansion. For policymakers and ecosystem organisations, it can help clarify where collaboration and inward investment may be most effective in reinforcing Germany’s strategic priorities while also generating wider UK – Germany value.

¹ Welsh Government, 2023. Wales strengthens cooperation with German state of Baden-Württemberg through signing of a joint declaration. [Online] Available at: <https://www.gov.wales/wales-strengthens-cooperation-german-state-baden-wurtemberg-through-signing-joint-declaration> [Accessed 26th March 2026].

² UK Government, 2025. Treaty between the United Kingdom of Great Britain and Northern Ireland and the Federal Republic of Germany on friendship and bilateral cooperation. [Online] Available at: <https://www.gov.uk/government/news/treaty-between-the-united-kingdom-of-great-britain-and-northern-ireland-and-the-federal-republic-of-germany-on-friendship-and-bilateral-cooperation> [Accessed 26th March 2026].

Caveats and Limitations

As with all studies, it is important to recognise and acknowledge limitations and highlight appropriate caveats.

The scale and complexity of the space ecosystem presents significant challenges to developing a complete and comprehensive mapping of all supply chain stakeholders, their capabilities, and their activities. It is important to recognise that this analysis, while insightful, may not capture every aspect of the space capability landscape. Mapping has been limited by the availability of data, particularly with respect to private sector infrastructure where providers may not always publicise the full extent of their capabilities for commercial or proprietary reasons. This report may therefore, in certain areas, be limited in its ability to evaluate and analyse all activities and capabilities available to support the realisation of capability goals.

These limitations underscore the importance of interpreting the findings with caution, particularly where generalisations or extrapolations are made. Future research would benefit from additional primary data collection and expanded stakeholder engagement to address these gaps.

For further insights into the organisations and stakeholders working across Germany, please visit the Catapult's [*Space Capabilities Catalogue \(SCC\)*](#).

Germany

The German Space Sector, Strategy, & Priorities



The German Space Story

Germany's early contribution to spaceflight is rooted in a long European lineage of rocketry and experimentation in the early twentieth century. Foundational concepts of staged rockets had circulated for centuries, but the field began to crystallise in the interwar period as rocketry moved from speculation towards engineering.

In the 1920s, spaceflight entered the technical mainstream through influential theoretical work (notably Hermann Oberth's 1923 treatment of rockets for interplanetary travel) and a growing community of practitioners. This momentum consolidated with the formation of the Verein für Raumschiffahrt (VfR: Society for Space Travel), one of the best-known early rocketry organisations, in 1927, and by 1931 Johannes Winkler had achieved an early liquid-propellant launch in Europe, modest in altitude, but an important marker of capability shifting from theory to practical systems.

Through the 1930s, that experimental culture scaled into larger engineering programmes and dedicated facilities, culminating in development of the A4 rocket. In October 1942 the A4 reached roughly 100 kilometres, demonstrating a major technical threshold in propulsion, guidance, and systems integration, and later evolved into the V2.

Germany's modern space story begins not with a single national moonshot, but with a deliberate post-war pivot from rocketry as a weapon to space as a scientific and industrial capability, largely pursued through European cooperation. In the 1960s, West Germany began building the institutional and technical foundations needed to participate in international missions, including mission operations capabilities that would later become nationally significant. The German Space Operations Centre (GSOC) has operated spaceflight missions since 1969, anchoring a long-term competence in controlling satellites and human spaceflight operations from Oberpfaffenhofen (DLR, n.d.)³.

³ DLR, n.d. The Space Operations and Astronaut Training institution. [Online] Available at: <https://www.dlr.de/en/rb/about-us/space-operations-and-astronaut-training> [Accessed 20th January 2026].

A first visible milestone in national satellite capability came in 1969 with AZUR, Germany's first satellite, which helped establish early competence in spacecraft development and space science (DLR, n.d.)⁴. From there, Germany increasingly channelled ambition through European frameworks, becoming a major contributor to, and shaper of, the European space project through ESA and related institutions.

In the late 1970s and 1980s, Germany's role became more pronounced via human spaceflight and laboratory missions. A defining example is Spacelab, a reusable orbital laboratory designed by ESA and flown in NASA's Space Shuttle payload bay from 1983 onwards, often cited as a model of transatlantic cooperation and a practical pathway for European (including German) microgravity research. This period helped consolidate Germany's blend of industrial production, mission operations and scientific payload development as a sustained comparative advantage.

Following reunification, Germany's space economy matured into a broad-based system spanning upstream manufacturing, research infrastructure, and downstream data and applications. Over time, German industry and research institutions became embedded across ESA missions (Earth Observation (EO), telecommunications, exploration, and science) and EU flagship programmes such as Galileo and Copernicus, reinforcing Germany's profile as a dependable systems and operations partner as well as a technology developer.

Germany's long-standing industrial geography also shaped its space trajectory. Bremen, in particular, emerged as a focal point for European human spaceflight hardware: ESA's Columbus laboratory, Europe's principal ISS module, completed final integration in Bremen before delivery, reflecting the city's role in European space manufacturing supply chains (ESA, 2006)⁵.

In the 2020s, Germany has sought to translate this institutional strength into competitiveness under "NewSpace" conditions: faster cycles, more commercial capital, and a greater emphasis on resilient infrastructure, secure connectivity, and scalable downstream services. This is accompanied by a sharper security framing across Europe, with Germany positioning space as both critical infrastructure and a strategic domain, while continuing to treat European cooperation as the default route to scale.

It is against this backdrop that Germany's recent strategic framework has been formalised. The 2023 Space Strategy was published in response to the growing relevance of space, a changed geopolitical environment, intensifying economic and systems competition between major blocs, accelerating climate pressures, and the rising centrality of safe and sustainable space activity as overall space use grows. It also reflects a market transition: the strategy notes the shift from institutionally dominated programmes to a more dynamic, competitive space economy, and sets out the need for a new framework linking public programmes with market competition (BMWK, 2023)⁶. The 2025 Space Safety and Security Strategy builds on this foundation and is anchored in a deteriorating European security environment. It highlights the increasing prevalence of counterspace threats (including destructive ASAT testing and wider interference with satellite services), and positions space security as a whole-of-government task within an integrated security approach, building on the National Security Strategy and the Space Strategy (BReg, 2025)⁷.

Taken together, these trajectories and strategies reflect a consistent through-line in Germany's space story: a sustained commitment to European partnership and technically demanding roles (manufacturing, mission operations, and high-value research), now paired with a more explicit focus on resilience, sovereignty, and security of space-enabled services. As space becomes more contested and more economically consequential, Germany's current posture can be read as an attempt to protect the reliability of the systems it depends on, while ensuring its industrial and research base remains competitive in the next phase of global space development.

⁴ DLR, n.d. Time-line of im-por-tant events. [Online] Available at: <https://www.dlr.de/en/dlr/about-us/history-of-dlr/timeline-of-important-events> [Accessed 20th January 2026].

⁵ ESA, 2006. N° 15-2006: European Columbus laboratory for the International Space Station ready for delivery. [Online] Available at: https://www.esa.int/Newsroom/Press_Releases/European_Columbus_laboratory_for_the_International_Space_Station_ready_for_delivery [Accessed 20th January 2026].

⁶ BMWK, 2023. The German Federal Government's Space Strategy, Berlin, Germany: Federal Ministry for Economic Affairs and Climate Action.

⁷ BReg, 2025. Space Safety and Security Strategy, Berlin, Germany: Federal Government of Germany.

Strategies & Priorities

Germany's space strategy for the period leading up to and including 2030 is defined by two key documents: the comprehensive Federal Government Space Strategy (September 2023) and the more recent, defence-focused Space Safety and Security Strategy (November 2025).

The German Federal Government's Space Strategy

The 2023 Space Strategy defines nine areas of activity as the basis for Germany's space policy goals to 2030, with implementation led across multiple federal ministries and supported by "key projects" intended to begin within the current legislative period. The nine areas are:

1. **European and international cooperation:** Germany positions ESA / EUMETSAT / EU cooperation as the "basic pillar" for successful space policy, with aims including: safeguarding ESA's independent role and strengthening its capacity; maintaining EUMETSAT's role; clarifying role distribution between ESA / EUMETSAT / EU; and encouraging procurement that strengthens European competition, innovation, and (where possible) sustainable space use, while keeping tenders accessible to SMEs and start-ups.
2. **Space as a growth market; high-tech and NewSpace:** The strategy explicitly frames NewSpace as a market shift requiring "attractive basic conditions" and an innovation ecosystem spanning corporates, SMEs, start-ups and research, oriented towards a resource-conserving, low-emissions value chain. It sets aims to help German firms position competitively in small satellites and microlaunchers, improve financing pathways (including private capital), and expand use of "anchor customer" approaches (including in ESA / EU tenders).
3. **Climate change, resource protection, and environmental protection:** The strategy emphasises the role of space services and cooperation in climate and environmental protection, including enabling reliable access to satellite data and tools (notably through cloud-based approaches) and integrated products combining multiple data sources (satellites / overflight / terrestrial measurements) to support climate and environmental research and monitoring.
4. **Digitalisation, data, and downstream activities:** Germany links competitiveness to reliable, secure availability of data services and the infrastructures to access them, supporting further development of international systems and national platforms such as CODE-DE. The strategy also stresses consolidating "government downstream requirements", expanding Copernicus uptake across public administration, supporting IRIS² framework conditions (including SME / start-up inclusion via competitive tendering), and strengthening competence clusters (including the German Galileo Control Centre).
5. **Security, strategic options, and global stability:** The Space Strategy places space security primarily in EU / NATO and partner-country frameworks, stressing that civil and military capabilities depend on resilient space infrastructure and services. It calls for guidelines for protection and defence in space and for greater national resilience, and notes Germany's commitment to international rule-making and risk reduction (including rejecting destructive ASAT missile tests and committing to refrain from them).

- 6. Sustainable, safe use of space:** Germany sets out sustainability and safety as a high priority, linking it to protection of space as a common resource, prevention of environmental damage in space and adverse impacts on Earth, and strengthening international frameworks for space governance. A specific “key project” focus includes building national capabilities for space situational awareness through 2030, including sensors and the German Space Situational Awareness Centre (GSSAC), and continued leadership in EU SST.
- 7. Space research:** The Space Strategy treats space research as a core national capability spanning both in-space and ground-based research, with a stated intent to sustain Germany’s leading role in European science missions and to translate research excellence into innovation and wider societal benefit. It emphasises Germany’s strong engagement in the ESA Science Programme (including instrument development through science–industry collaboration), continued use of the ISS (and preparation for the post-ISS era), and the role of smaller satellite approaches in enabling scientific missions and participation pathways.
- 8. International space exploration:** Germany’s exploration aims are explicitly stated as: international cooperation, cutting-edge technologies, scientific research, and human inspiration. It highlights ambitions around robotic landers and lunar logistics (EL3 / “Argonaut”), Germany’s responsibility for the European Service Module contribution, support for German ESA reserve astronauts, and a focus on selected enabling technologies (e.g., robotics and AI), alongside support for international regulation of activities on celestial bodies and space resources.
- 9. Space activities in the context of recruiting and attracting talent:** The Space Strategy frames space as a lever for strengthening the talent pipeline, arguing that space programmes should be used more actively to attract and retain skilled individuals, raise public visibility of space benefits, and stimulate interest in STEM and adjacent disciplines. It highlights the need for targeted education and training support (including upskilling and lifelong learning as NewSpace draws in more diverse professional backgrounds), and points to instruments such as student programmes / competitions and the profile effect of astronaut selection as mechanisms to inspire and broaden participation.

Taken together, the strategies outline an integrated approach covering civil, commercial, and defence aspects to ensure Germany's long-term ability to operate in space, covering areas such as:

- **Security and defence:** Germany is shifting towards a more robust military stance, categorizing space as a critical infrastructure sector. The strategy emphasizes building deterrence, strengthening resilience against threats like cyberattacks and jamming, and developing national and European space security architectures in cooperation with NATO and EU partners.
- **European Autonomy:** A central goal is to reduce dependence on non-European actors for vital services, including independent access to space through national and European launch capabilities. This includes supporting the development of competitive launchers by German start-ups like Isar Aerospace and Rocket Factory Augsburg (RFA).
- **Climate and Earth Observation:** The strategy places a major emphasis on using satellites for climate and environmental monitoring, with significant investment in programs like Copernicus and EUMETSAT.
- **Technological Innovation and "NewSpace":** Germany aims to foster a dynamic commercial space sector ("NewSpace") by encouraging private investment, supporting start-ups, and investing in key technologies such as artificial intelligence (AI), quantum technologies, and advanced data utilization. A Space Innovation Hub has been launched to facilitate this.
- **International Cooperation and Regulation:** Germany is committed to the peaceful use of space and strengthening international space law. It actively participates in international bodies and is developing national legal frameworks, including a potential future German space law, to provide a clear regulatory environment for the industry.

German Space Sector Gap Analysis

Using ecosystem data presented in the Satellite Applications Catapult's Space Capabilities Catalogue as of March 2026, this section identifies where Germany has existing strengths in the priority areas set out above. The following segment shall seek to outline, in brief, where Germany already excels and where it needs to develop to meet the objectives set out in its Strategies. Each segment will outline a strategic priority, existing strengths, and areas for development.

NewSpace Growth & Commercial Scaling

Expertise

Germany's ecosystem shows strong depth in upstream engineering and build capability, dominated by activities such as manufacturing, payload and subsystem assembly, integration and test, and specialist engineering services. This "industrial backbone" is visible in the concentration of established primes and Tier-1 capability (e.g., Airbus Defence & Space, OHB, TESAT Spacecom, HENSOLDT) alongside a large tail of specialist engineering, electronics, materials, software, and test providers in the supply chain

It is also reflected in a growing cohort of commercially oriented NewSpace actors spanning smallsat platforms and integration (Berlin Space Technologies, Exolaunch), optical / communications hardware (Mynaric), and emerging service propositions (e.g., constellr in thermal EO). This suggests a mature technical base with high capacity to design, manufacture, qualify, and supply complex systems. Germany's strategic intent to foster NewSpace and make space a growth market is therefore built on substantial engineering foundations (BMWK, 2023).

Opportunity Area

The central challenge is to convert a technically strong, engineering-heavy ecosystem into a scalable commercial space economy with repeatable products, operators, and demand pull-through. This implies three practical opportunity areas:

- **Scaling operation capability (beyond build):** Germany has world-class technology developers, but has a thinner layer of organisations whose core competence is operating space-enabled services at scale, mission operations, service operations, reliability engineering, and long-term customer delivery. Where operator capability is visible, it is often concentrated in a small number of large players or institutional operators. The strategic gap is, therefore, less about developing technology and more about building the operational wrap that turns a capability into a service customers renew: service assurance, incident management, lifecycle support, and customer success functions that make performance dependable in production, not just in demonstration. Without that layer, the ecosystem risks remaining "project-shaped" (engineering delivery, pilots, one-off deployments) rather than "service-shaped" (recurring revenue, long-term contracts, predictable cashflow).
- **Anchor customer and procurement-to-scale pathways:** The Space Strategy explicitly points to "anchor customer" mechanisms and improved financing pathways to help SMEs and start-ups scale. Germany has a large supply base capable of building systems and analytics, but scaling will depend on demand design: contracting models that allow government and institutional buyers to purchase services repeatedly, not commission bespoke projects each time. The practical gap is the absence (or inconsistency) of repeatable procurement routes that create predictable revenue and reference customers. If public demand is fragmented across agencies and Länder, suppliers struggle to productise and investors struggle to underwrite scale. Conversely, if Germany can consolidate requirements, standardise procurement frameworks, and commit to multi-year service contracts in priority domains (e.g., EO environmental services, secure communications, SSA), the ecosystem will be able to shift from grant / project dependence to commercial scale.
- **Systems integration and productisation:** Germany's ecosystem contains many specialist firms and component providers, but scaling requires stronger integrator capacity that can package those building blocks into "buyable" offerings, complete with security assurance, performance guarantees, and clear liability. That means more entities (or more integrator functions within existing primes and mid-caps) that can combine spacecraft / payload supply chains with data pipelines, ground segment, and cyber assurance into end-to-end propositions. This is especially critical because Germany's strategic ambitions are increasingly system-level (resilient architectures, secure connectivity, safety / security, sustainability). These ambitions cannot be delivered by component excellence alone: they require integrators who can assemble multi-party capability into coherent solutions with defined service levels, certification / assurance pathways, and operational governance that makes adoption straightforward for risk-sensitive customers.



Access to Space & Launcher Competitiveness

Expertise

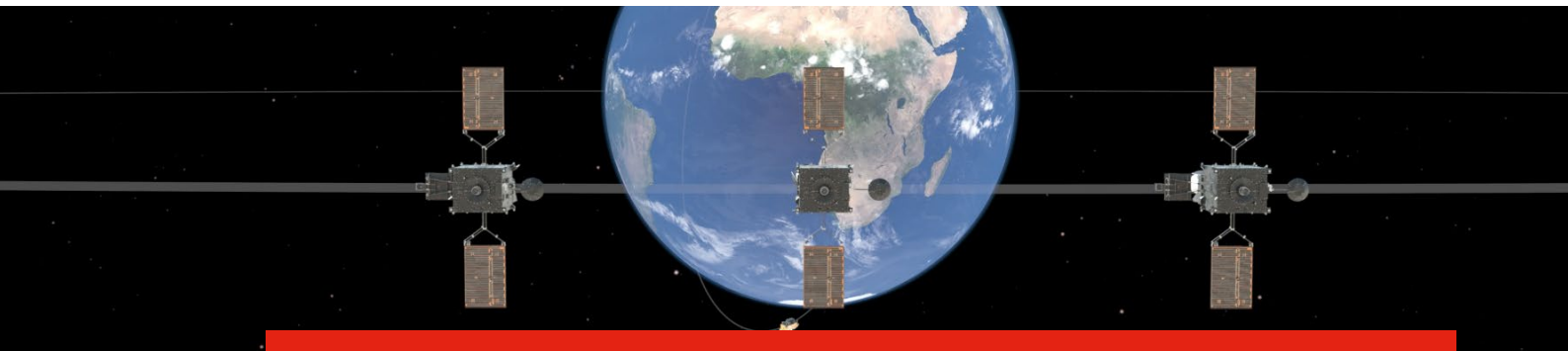
Germany has visible launcher-related capability concentrated in a comparatively small set of specialist organisations, supported by a much broader enabling base in propulsion, structures, avionics, materials, and test. On the launcher side, the ecosystem includes new-generation providers such as Isar Aerospace and Rocket Factory Augsburg (RFA), and propulsion-focused entrants such as HyImpulse (suborbital / hybrid), alongside established European launcher and subsystem capability anchored through large industrial groups (e.g., ArianeGroup and German industry participants across the Ariane value chain).

In parallel, Germany's propulsion and qualification infrastructure base (e.g., DLR Lampoldshausen and associated industrial partners) provides credible underpinning for engine development and system testing. Strategically, Germany is explicit about strengthening European autonomy and competitiveness, including launch capabilities and the broader conditions for NewSpace growth.

Opportunity Area

The principal gap is to translate launcher activity into reliable cadence and full-stack readiness, rather than isolated demonstrations. This implies three concrete opportunity areas:

- **Depth of the launch supply chain and qualification capacity:** Launch capability exists, but it thins as you move from enabling engineering into full system qualification, verification and validated operations. Strategic autonomy depends on robust qualification pipelines (test, range, safety cases, flight termination, regulated operations) that can support repeatability, not just capability in principle. This is where Germany's wider industrial strength must be "connected" to launcher delivery: ensuring that specialist suppliers can meet launch-specific requirements (traceability, acceptance testing, configuration control, and safety assurance) at the speed and cost points NewSpace demands.
- **Cadence, operational resilience, and learning loops:** Public evidence shows German microlaunchers are still in early flight / qualification phases, and reliability and cadence remain the gating conditions for "responsive" access to space. For example, Isar Aerospace successfully completed a second Spectrum flight in March 2026 following its first test flight in March 2025. RFA has delivered stages to SaxaVord ready for a test flight in 2026. The gap is, therefore, operational maturity: test-to-flight learning loops, manufacturing throughput, ground processing, launch site readiness, and a stable cadence. "Autonomy" in practice is earned through repeatability and reliability, not the existence of a vehicle design.
- **European autonomy versus practical dependency:** Near-term pathways will depend on non-German launch geography and partner regulation. Isar's Spectrum launches are conducted from Andøya (Norway), while RFA's initial launch campaign is tied to SaxaVord (UK), with the UK regulator having already granted a vertical launch licence for RFA's planned operations. HyImpulse has also signed an agreement with SaxaVord for a future SR75 flight from European territory. The strategic opportunity is to manage this pragmatically: partner for near-term access while accelerating the industrial, regulatory, and operational foundations required for medium-term autonomy. That means treating external spaceports not as a strategic failure, but as a bridging mechanism, provided Germany is simultaneously building the European supply-chain depth, qualification capacity, and operational maturity that will ultimately underpin sovereign and resilient access.



Climate, Environment, & Earth Observation (EO)

Expertise

Germany has substantial EO and geospatial depth across both institutional and commercial actors, spanning data acquisition, processing, analytics, and sector-specific applications. This is visible in a mix of operational and capability-building organisations: EUMETSAT provides a major operational anchor for meteorological EO in Europe; Airbus Defence & Space and HENSOLDT represent industrial-scale upstream competence relevant to EO payloads, systems, and security-adjacent sensing; and a strong set of specialist downstream providers convert EO into usable products and services. This breadth aligns closely with the Space Strategy’s emphasis on climate / resource / environmental protection and the development of integrated products combining multiple data sources and delivery mechanisms.

Opportunity Area

The principal gap is to turn strong EO capability into operational, adopted services that public authorities and critical sectors buy and rely upon:

- **From analytics to operational decision services:** Germany has many capable analytics and mapping providers, but the strategic ambition requires services that connect EO to operational workflows, early warning, prioritisation, inspection regimes, regulatory compliance, and response planning. This means moving from “data outputs” to decision support and action: products that embed alerts, audit trails, and integration into customer workflows. The scaling gap is packaging outputs into end-to-end operational services with clear outcomes (reduced risk, faster response, lower lifecycle costs) and dependable service levels.
- **Institutional uptake and demand aggregation (making adoption repeatable):** Germany’s CODE-DE platform provides cloud access and processing resources for EO data and is explicitly aimed at public authorities and their contractors. The gap is consistent adoption at scale: standardised procurement patterns, cross-ministry and cross-Länder demand coordination, and a shared set of operational requirements so providers can build repeatable products rather than one-off pilots. Without coordinated requirements, EO services remain fragmented, and value remains trapped in demonstrations. With coordinated requirements, suppliers can reuse architectures, assurance artefacts, and delivery playbooks, shortening procurement cycles and improving reliability.
- **Integration with terrestrial and airborne data (interoperability and trust):** The Space Strategy calls for integrated products combining satellite data with other measurement systems. This places a practical premium on interoperability and data-fusion readiness: common standards, trusted pipelines, and validated methods that allow satellites, aerial surveys, in-situ sensors, and models to be combined operationally, including in regulated or risk-sensitive environments (e.g., flood risk, environmental compliance, infrastructure monitoring). The opportunity is to formalise architectures and workflows (data fusion, handling, auditability), so that multi-source products can be deployed consistently across agencies and sectors rather than rebuilt case by case.



Digitalisation, Data Infrastructure, & Secure Connectivity

Expertise

Germany has strong digital and downstream building blocks across space software, data infrastructure, and communications capability, underpinned by an established institutional backbone for data access and service delivery. The national CODE-DE platform provides cloud-enabled access to EO data and is explicitly aimed at public authorities and their contractors, reflecting a deliberate effort to make satellite data usable “where the user is” (in cloud workflows). Germany’s wider downstream competence is reinforced by organisations that combine industrial-scale systems delivery with high-assurance operations, including established communications and space-ICT actors such as TESAT Spacecom and mission / ground segment service providers such as DLR GfR, as well as a broad set of software and analytics firms that convert EO and satcom into applications. Germany’s strategic intent to strengthen secure data availability, platform access, and downstream development therefore rests on a credible base of technical capability and institutional infrastructure.

Opportunity Area

The principal gap is to move from “building blocks” to secure, operator-grade service delivery for government and critical users. This implies three concrete opportunity areas:

- **Operator and integrator depth for secure connectivity:** Secure connectivity ambitions (including European multi-orbit secure communications initiatives) require integrators who can design and operate end-to-end architectures with certification, service-level commitments, and lifecycle support. Germany has strong component and subsystem capability and a mature operations footprint in specific programmes (for example, high-automation control centre operations in Oberpfaffenhofen and wider mission operations delivery via DLR-linked entities), but the adoption barrier is often the lack of “single accountable delivery” for secure services across space, ground, and user integration. The gap is not connectivity technology per se; it is the service wrap: assured integration into government networks, accredited security controls, continuous monitoring, and operational governance that allows critical users to treat space-enabled connectivity as dependable infrastructure rather than a pilot capability.
- **Assured cloud and sovereign data pathways:** CODE-DE demonstrates Germany’s emphasis on cloud-enabled EO access and processing for public-sector users. The gap is to extend this model into a broader, cross-domain “single point of access” that supports sensitive users without bespoke engineering each time: trusted identity and access management, auditability, security accreditation, and consistent operating procedures that make data services procurement-ready. This becomes more important as secure connectivity and resilience objectives rise: customers will not only ask “can you provide the data?” but “can you prove the chain of custody, integrity, and compliance end-to-end?” Where those assurances are missing, services tend to stall at prototype stage because the operational and regulatory risk is too high.
- **Downstream demand coordination and reuse:** The Space Strategy references consolidating “government downstream requirements” to strengthen adoption and market formation. The key gap is that requirements and procurement remain fragmented across agencies and Länder, driving duplication of pilots and one-off solutions. Coordinated requirements enable reusable products: suppliers can build standardised service packages, shorten procurement cycles, and reduce delivery risk because the same architectures and assurance artefacts can be reused. This is also where the economics of secure services become viable: shared baselines and pooled demand create the recurring revenue that supports operator-grade reliability and continuous improvement.



Space Safety, Security, & Resilience

Expertise

Germany has a meaningful security-adjacent footprint and established institutional capability for space situational awareness through the German Space Situational Awareness Centre (GSSAC) in Uedem, operated jointly by the German Air Force and the German Space Agency at DLR since 2011. Strategically, the 2025 Space Safety and Security Strategy explicitly frames space as critical infrastructure and sets action areas focused on resilience and deterrence, anchored in close cooperation with NATO allies and European / international partners.

On the supply side, Germany's ecosystem includes defence and security actors able to contribute to space-domain awareness, protected sensing, and high-assurance communications and systems integration. Illustrative examples include HENSOLDT (space situational awareness sensors and solutions), which positions itself explicitly across space and cyber and describes SSA capabilities for tracking and characterising objects in orbit. Germany also has prime-level industrial capability that supports secure architectures and mission assurance (e.g., Airbus Defence & Space and OHB) alongside specialist cyber and information assurance capability (e.g., secunet) and long-standing test / verification bodies (e.g., IABG) that underpin assurance and qualification.

Opportunity Area

The principal gap is to translate security intent into integrated operational readiness across sensing, decision, and response, beyond technology components:

- **Security-by-design as a gate condition for adoption:** The security strategy stresses the risk landscape: interference, cyber threats, and the vulnerability of space-enabled services that underpin modern society. Even where technical capability exists, services will stall without credible assurance that critical users can accept as standard: supply chain security, secure-by-design architectures, vulnerability management, and audited operational security models. The practical adoption barrier is usually not whether an EO or comms service “works”, but whether it can be trusted, accredited, and sustained under hostile conditions. This pushes Germany towards a default requirement for “assurance artefacts” (accreditation, audit trails, continuous monitoring, incident response readiness) built into services from day one, rather than added after pilots.
- **Civil-military integration pathways (governance, concepts, exercising):** The 2025 strategy is explicitly whole-of-government and positions the Bundeswehr as the backbone of national space safety and security architecture. The gap is often governance and integration rather than technology: shared operating concepts, clear division of roles across ministries, and rapid contracting mechanisms that allow government to pull in commercial capability at speed. Operational readiness also requires structured exercising and testing regimes, validating that sensing, analysis, decision-making and response are actually joined up, not merely co-located on paper. Germany's establishment of a dedicated military space command (introduced in 2021 at Uedem) underscores the shift in posture; the delivery challenge is turning that posture into integrated national routines across civil and military actors.
- **Resilience engineering and reconstitution planning (continuity under disruption):** Deterrence and resilience require redundancy, alternative pathways, and recovery / reconstitution options so that services can be maintained during disruption, not merely restored after failure. This is where technical capability must be packaged into “resilience products”: diverse data sources; protected links; alternative ground segment options; and pre-arranged contractual and operational mechanisms to surge capacity. The 2025 strategy's focus on maintaining the ability to act in space across peace, crisis, and defence implies that resilience engineering must be treated as a design objective, a procurement condition, and a run-time operational discipline, not a contingency afterthought.

Summary

Germany is a major European space power whose modern role has been defined less by standalone national programmes and more by sustained leadership within European cooperation, particularly through technically demanding contributions in manufacturing, mission operations, and high-value research.

From early rocketry foundations through to post-war institutional capability (notably long-running mission operations and strong industrial geography in regions such as Bremen), Germany has built a mature space economy spanning upstream manufacturing, research infrastructure, and downstream services. In the 2020s, this legacy is being reframed for “NewSpace” conditions, shorter development cycles, increased commercial capital, and a sharper focus on resilience, sovereignty, and the protection of space-enabled services as critical infrastructure.

Germany’s strategic direction to 2030 is set by two documents: the Federal Government Space Strategy (2023) and the Space Safety and Security Strategy (2025). Together, they describe an integrated civil–commercial–defence posture focused on European and international cooperation (as a foundational pillar), competitiveness and market growth (including microlaunchers and small satellites), climate and environmental monitoring (with strong emphasis on EO and data access), secure digital / data infrastructure (including platforms such as CODE-DE and alignment with European secure connectivity), and a stronger security stance that treats space as critical infrastructure and prioritises resilience, deterrence, and responsible behaviour in space. The Space Strategy also reinforces Germany’s commitment to science leadership (ESA science, ISS and post-ISS planning) and uses space as a lever for talent attraction and skills development.

Against this strategic ambition, the ecosystem evidence suggests Germany’s core strength lies in a deep engineering and manufacturing base, reinforced by a growing cohort of commercially oriented NewSpace actors. The key delivery gaps are therefore less about the absence of technology, and more about scaling and operationalisation:

- **Security & Defence:** The main gap is not technology, but operational readiness. Germany needs security-by-design as standard (accreditation, assurance artefacts, supply-chain security), clearer civil–military ways of working (shared operating concepts, exercising, rapid contracting), and resilience engineering that keeps services running during disruption rather than restoring them afterwards.
- **European Autonomy:** The constraint is turning “autonomy” into something that works in practice. Germany has credible launcher entrants and enabling capability, but it still needs reliable cadence and full-stack readiness; and, in the near term, it will often have to rely on partner spaceports and regulation while domestic and European capability matures.
- **Climate & Earth Observation:** The capability is strong, but adoption is the sticking point. The gap is moving from analytics and pilots to operational decision services that slot into real workflows, backed by coordinated requirements and repeatable procurement, and supported by interoperable data-fusion pipelines that combine satellite, airborne, and in-situ sources.
- **Technological Innovation & “NewSpace”:** Germany is excellent at building, but scaling depends on operating. The gap is a thinner layer of operator-grade service delivery and integrator capacity to package multi-party capability into “buyable” offerings, alongside the demand-side mechanisms, anchor customers, predictable contracts, and productisation pathways, that unlock private investment.

Overall, Germany is well positioned to deliver on its ambitions, the underlying capability base is strong: it has globally competitive engineering and manufacturing, proven institutional delivery, and growing NewSpace momentum, but needs focus on the “last mile” of scale. Operator-grade service delivery, clearer demand pull-through, and security and resilience embedded by default should be the focus. Germany can convert its technical strength into sustained commercial growth and strategic autonomy. In doing so, it will be able not only to protect the space-enabled services it depends on, but to shape the European market for secure, sustainable, and operationally reliable space infrastructure in the decade ahead.

Conclusions

The report finds that Germany has a highly capable and strategically significant space sector, with a strong international position built on engineering depth, advanced manufacturing, research excellence, and sustained participation in European cooperation.

Its development has been shaped less by a standalone national programme than by technically demanding contributions across ESA and EU systems, including mission operations, human spaceflight hardware, scientific payloads, Earth observation, and downstream public-interest services. Germany enters the present decade not as a new entrant seeking capability, but as an established space power seeking to adapt that capability to a more commercial, contested, and strategically sensitive environment.

A central finding of the report is that Germany's strength lies in the depth and reliability of its underlying ecosystem. The sector shows substantial capability in manufacturing, payload and subsystem assembly, integration and test, specialist engineering, research translation, and contributions to European infrastructure and services. At strategy level, Germany has also articulated a broad and coherent agenda that links NewSpace growth, climate and environmental services, digital infrastructure, secure connectivity, sustainability, talent, and security. This gives Germany a strong foundation from which to shape the next phase of European space development.

At the same time, the report shows that Germany's challenge is one of commercial conversion, operational scale, and market broadening. In several priority areas, Germany already has the technical base and institutional support required for success. The more difficult task is to ensure that these strengths are translated into repeatable service models, stronger operator capability, more scalable NewSpace firms, improved procurement-to-scale pathways, more competitive launch options, wider downstream adoption, and more integrated resilience in data and security-relevant infrastructures. The issue is therefore not simply whether Germany can build sophisticated systems, but whether it can commercialise and operationalise them at greater scale.

The report also suggests that Germany is strongest where it builds on its established industrial and institutional position while adapting more quickly to market change. That includes NewSpace growth and commercial scaling, launcher competitiveness, secure data infrastructure, and space safety and resilience. Germany's next phase of success is therefore likely to depend on how effectively it combines industrial depth and research strength with more agile commercial pathways, stronger demand-side mechanisms, and a more visible service-led market proposition.

Opportunities in Germany

For readers considering how to engage with Germany, the report points to several practical opportunity areas.

Collaboration opportunities are strongest where Germany already has deep technical or industrial capability but where partnership can help accelerate service development, operational scale, or downstream application. This is particularly evident in advanced manufacturing, payloads and subsystems, digital data infrastructure, secure connectivity, and selected safety and security domains. Germany appears especially well positioned for collaborative activity that links strong upstream capability to scalable service models, operational delivery, or wider European market deployment.

Foreign direct investment opportunities are strongest where Germany has substantial engineering and industrial credibility but would benefit from stronger commercial acceleration, operator growth, or expanded innovation pathways for SMEs and start-ups. This includes NewSpace firms, launcher-related activity, secure and resilient data infrastructure, and selected downstream applications. For inward investors, the German proposition is likely to be strongest where capital can help bridge the gap between proven technical capability and larger-scale market capture.

Export opportunities are most evident where Germany already has internationally relevant capability in high-value manufacturing, specialist engineering, scientific payloads, climate and environmental services, and secure digital infrastructure. Germany's export strength appears strongest where these capabilities can be positioned as part of wider European reliability, technical excellence, and mission-critical performance, rather than as isolated technical components alone.

Capability-development opportunities arise in those areas where Germany has clear strategic ambition but still

needs stronger enabling layers to secure long-term leadership. This includes commercial operator capability, anchor-customer and procurement-to-scale pathways, more competitive launch access, broader downstream market adoption, and the development of security-relevant and digital infrastructures that are resilient by design. For organisations looking to build, invest, or partner in Germany, these areas may offer the most strategically significant opportunities to shape the next phase of ecosystem development.

Closing Conclusion

Overall, the report suggests that Germany is exceptionally well positioned to remain one of Europe's leading space economies, but that its next phase of success will depend on how effectively it converts existing strength into greater commercial speed, operational scale, and market reach. Germany's strongest opportunity lies not in replicating capabilities it already has in abundance, but in linking industrial depth, research excellence, and strategic seriousness to stronger service models, broader adoption, and more visible NewSpace growth. For collaborators, investors, and international partners, this makes Germany an attractive proposition: a mature and technically powerful ecosystem with clear strategic direction and a range of opportunity areas where well-targeted engagement could generate meaningful economic and strategic value.

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