Baden-Württemberg Space Sector Study

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SPACE WALES

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Executive Summary

This report compares the space ecosystems of the United Kingdom (UK) and Germany, with a particular focus on Wales and Baden-Württemberg, to identify areas of complementary strength, strategic gap, and practical opportunity.

It is intended to support more informed bilateral engagement between both nations, and both regions, with emphasis on collaboration, foreign direct investment, and export potential. The work also 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].

This report examines Baden-Württemberg'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 Baden-Württemberg offers credible opportunities for collaboration, foreign direct investment, and export, and where targeted engagement could generate practical value for Welsh and wider UK 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 Baden-Württemberg-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 Baden-Württemberg as a partner region for collaboration, trade, and inward investment. More broadly, it offers value to Welsh and UK stakeholders by improving understanding of one of Germany's most important regional space ecosystems, helping industry, policymakers, and investors identify where Baden-

[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-wurttemberg-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].

Württemberg's strengths, priorities, and capability needs may create opportunities for 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)[3],[4].

The analysis shows that Baden-Württemberg is a highly capable regional ecosystem embedded within German and European space activity. Its strength lies in the concentration of advanced manufacturing, applied engineering, propulsion, satellite communications, mission design, and research capability across several regional hubs, including Friedrichshafen, Backnang, Stuttgart, Lampoldshausen, and Ulm. The region's role is, therefore, less about political visibility and more about the industrial and scientific depth that underpins wider German and European systems.

The report also finds that Baden-Württemberg's strategic direction is set out through the space elements of the state's 2023 aerospace strategy. That strategy treats space as part of a wider regional competitiveness agenda built around digitalisation, sustainability, NewSpace growth, cross-sector innovation, and stronger visibility for Baden-Württemberg as a space location. Measures such as the Integrated Research Platform for Affordable Satellites (IRAS), the sustainable space programme, start-up support, and cross-sector networking initiatives show that the region is not seeking merely to preserve legacy strengths, but to reposition itself for a more commercial, data-enabled, and sustainability-driven space economy.

The central finding of the report is that Baden-Württemberg's principal challenge is not a lack of technical capability, but the need to convert that depth into a more complete and commercially mature ecosystem aligned with its strategic ambitions. In several priority areas, the region already has strong technical ingredients: engineering, manufacturing, propulsion, testing, and research. The key question is how effectively these can be translated into stronger downstream digital products, more coherent sustainable-space positioning, more integrated affordable mission architectures, and a broader commercial workforce able to scale firms and services.

For readers interested in practical engagement, the report points to several broad opportunity areas. These include NewSpace scaling and commercialisation, digitalisation and satellite-data-enabled business models, sustainable space and environmental services, affordable satellites and end-to-end integration, and the translation of research strength into broader commercial capability. Opportunities are strongest where collaborators, investors, and external partners can help Baden-Württemberg move from technical excellence and regional density towards greater productisation, scale-up, visibility, and market adoption.

[3] 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-wurttemberg-through-signing-joint-declaration [Accessed 26th March 2026].

[4] 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].

Introduction

This report provides an overview of Baden-Württemberg'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 Baden-Württemberg presents meaningful opportunities for collaboration, foreign direct investment, and export. It is intended for readers seeking to understand where regional organisations, institutions, and industrial capabilities already offer strong potential, where Baden-Württemberg is prioritising future growth, and where engagement with the region's space 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 Baden-Württemberg-focused work has a dual value: it supports a Wales-facing international partnership, but it also provides wider Welsh and UK stakeholders with clearer market intelligence on one of Germany's most significant regional space ecosystems. 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].

Baden-Württemberg 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 long-standing participation in German and European programmes, rather than by a standalone institutional architecture of its own. The region's foundations lie in broader strengths in precision engineering, aerospace, and high-value manufacturing, which over time translated into satellite systems, propulsion, telecommunications, instrumentation, mission design, and advanced research capability. More recently, this legacy has been reframed through a strategy that seeks to connect space more directly to digitalisation, sustainability, and cross-sector economic value.

The report is structured around that logic. It first outlines Baden-Württemberg's space story and the conditions that have shaped its current position; it then examines the strategic priorities set out in the 2023 aerospace strategy, which provides the clearest account of the region's intended direction of travel; finally, it considers the extent to which current ecosystem capability aligns with those priorities, identifying both the areas where Baden-Württemberg 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 regional profile. For industry, it can help indicate where Baden-Württemberg's capabilities may be relevant to customers, suppliers, and international partners, and where Welsh or UK firms may be well placed to complement regional strengths or address regional needs. For investors, it can help identify domains where Baden-Württemberg has substantial technical and industrial credibility but would benefit from stronger commercial scaling, productisation, or downstream expansion. For policymakers and ecosystem organisations, it can help clarify where collaboration and inward investment may be most effective in reinforcing the region's strategic priorities while also generating wider Wales – Germany and UK – Germany value.

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 the UK, Wales, Germany, and Baden-Württemberg space ecosystems, please visit the Catapult's *Space Capabilities Catalogue (SCC)*.

Baden-Württemberg

Baden-Württemberg's Space Sector, Strategy, & Priorities

The Baden-Württemberg Space Story

Baden-Württemberg's space story is best understood not as that of a standalone national programme, but as that of a highly capable regional ecosystem embedded within German and European space activity. Its role has been shaped by a combination of advanced manufacturing, applied engineering, strong research institutions, and long-standing participation in major European programmes. In this sense, Baden-Württemberg has developed as an important space region in Germany: less visible politically than the federal level, but highly significant in the underlying industrial and research capabilities that make space systems possible.

The region's foundations lie in its broader industrial profile. Baden-Württemberg is one of Europe's strongest centres for precision engineering, automotive technologies, machinery, electronics, and high-value manufacturing. Over time, these strengths translated naturally into aerospace and space, where reliability, systems integration, specialist components, and applied research are critical. A regional study describes Baden-Württemberg's strength as an integrated value chain running "from the screw to the research satellite", which is a useful shorthand for the region's character: it combines deep supplier capability with nationally significant prime and research assets (DGLR, 2020, p. 21)[5].

[5] DGLR, 2020. RAUMFAHRT IN BADEN-WÜRTTEMBERG, Bonn, Germany: German Society for Aeronautics and Astronautics.

A defining feature of Baden-Württemberg's development has been the concentration of complementary space capabilities in several regional hubs. Around Friedrichshafen and the Bodensee area, the region hosts major satellite manufacturing and space hardware capability. Backnang developed into a leading centre for satellite communications. Stuttgart became a focal point for university-led space systems research, mission design, satellite operations, navigation, and enabling technologies. Lampoldshausen emerged as one of Europe's most important propulsion and test locations, with DLR's Institute of Space Propulsion tracing its history there back to 1959 and serving as a major European research and test centre for liquid rocket propulsion. Ulm adds further depth through quantum technologies, AI security, and communications-related research relevant to future space systems and secure digital infrastructure (DLR, 2026a; DLR, 2026b; DLR, 2026c; DLR, 2026d)[6],[7],[8],[9].

The University of Stuttgart has been especially important in giving the region a distinctive space identity. Stuttgart hosts the largest aerospace faculty in Europe, while the university's Institute of Space Systems has built a strong profile in small satellites, satellite technology, mission operations, and experimental in-orbit systems (BaWü, 2023)[10]. Its infrastructure includes its own ground station and satellite control capabilities, allowing Baden-Württemberg not only to design and build space systems, but also to operate them (UoS, 2026)[11]. This gives the region an end-to-end competence that goes beyond component supply and into system demonstration, mission execution, and skills development.

Research depth is another central part of the story. Baden-Württemberg's space ecosystem is supported not only by industrial firms and the University of Stuttgart, but also by DLR sites in Stuttgart, Lampoldshausen and Ulm, alongside Fraunhofer institutes and wider scientific infrastructure. DLR Stuttgart works on lightweight structures, re-entry technologies, and laser-based systems for space debris monitoring and removal. Lampoldshausen remains a core European asset for propulsion testing and launcher-related R&D. In Ulm, DLR's quantum technologies work is explicitly geared towards precision instruments for space applications. Taken together, these assets mean the region is active across propulsion, structures, satellite systems, communications, safety, security, and advanced instrumentation.

Baden-Württemberg's role is also notable for the way civil, commercial, and research capabilities overlap. The region contributes to traditional space strengths such as satellites, telecommunications, Earth Observation (EO), instrumentation, and propulsion, but it is also positioning for newer areas associated with commercialisation and "NewSpace". The state's aerospace strategy, launched in 2023, frames this explicitly: Baden-Württemberg aims not just to preserve existing strengths, but to expand them, open new fields, and increase the visibility of regional actors in federal, EU, and ESA programmes.

This gives Baden-Württemberg a space story with two linked chapters. The first is one of industrial and scientific depth: a region that became indispensable to German and European space through engineering excellence, propulsion, satellite manufacturing, communications, and research. The second is one of adaptation: how that legacy base is being reframed for a more commercial, competitive, and technology-convergent era in which space increasingly intersects with AI, quantum, climate services, secure connectivity, autonomy, and resilient critical infrastructure. Rather than trying to replicate a full national space architecture, Baden-Württemberg's strength lies in being a dense, innovation-driven regional node within a larger German and European system, with unusual breadth from research and testing through to subsystem supply, mission capability, and advanced applications.

[6] DLR, 2026a. The Institute of Space Propulsion. [Online] Available at: https://www.dlr.de/en/ra [Accessed 23rd March 2026].

[7] DLR, 2026b. DLR site Lampoldshausen. [Online] Available at: https://www.dlr.de/en/dlr/locations-and-offices/lampoldshausen [Accessed 23rd March 2026].

[8] DLR, 2026c. The Institute of Quantum Technologies. [Online] Available at: https://www.dlr.de/en/qt [Accessed 23rd March 2026].

[9] DLR, 2026d. The Institute for AI Safety and Security. [Online] Available at: https://www.dlr.de/en/ki [Accessed 23rd March 2026].

[10] BaWü, 2023. THE Aerospace LÄND, Stuttgart, Germany: Ministry of Economic Affairs, Labour and Tourism.

[11] UoS, 2026. Institute for Space Systems: Infrastructure. [Online] Available at: https://www.irs.uni-stuttgart.de/en/research/satellitetechnology-and-instruments/smallsatelliteprogram/flying-laptop/infrastructure/ [Accessed 23rd March 2026].

Strategies & Priorities

Baden-Württemberg's space strategy is set out within the state's 2023 aerospace strategy, which presents space not as an isolated sector, but as a strategically important high-technology field linked to industrial competitiveness, research excellence, climate and environmental goals, and future digital services. Within that wider framework, the space components of the strategy are centred on strengthening Baden-Württemberg's established capabilities while expanding its position in NewSpace, where commercialisation, agile development, data-enabled services, and cross-sector innovation are becoming more important (BaWü, 2023, pp. 9 - 10). The strategy is therefore both defensive and developmental: it aims to preserve the region's existing strengths, while repositioning Baden-Württemberg for a more competitive, sustainability-driven, and commercially dynamic space economy.

At the highest level, the strategy states that Baden-Württemberg wants to remain among the most successful aerospace regions and to respond to the major challenges facing the sector through a future concept built on **digitalisation, sustainability**, and **cooperation** (BaWü, 2023, pp. 3 - 4). In the space context, these pillars have a clear meaning. **Digital** space is about accelerating digital uptake across the sector, especially among SMEs, and using increasing volumes of data, particularly satellite data, to generate new services and business models. **Sustainable** space is focused on developing environmentally responsible space technologies and establishing a recognisable quality positioning for sustainable aerospace made in Baden-Württemberg as a hallmark of quality (BaWü, 2023, p. 16). **Cooperative** space is concerned with strengthening political representation, increasing the visibility and networking of the sector, and deepening collaboration between space and other industries. These three pillars operate as the organising logic for the region's space objectives.

Within the strategies dedicated space action fields, it identifies several priority objectives:

1. It seeks to **strengthen existing core competencies in conventional space while broadening capabilities in NewSpace.** This includes maintaining strengths in established industrial and research activities, but also adapting the ecosystem to faster development cycles, more agile technology programmes, and new commercial market opportunities. The strategy is explicit that digitalisation and sustainability should not remain isolated projects, but should be spread more widely across the sector.

2. The strategy places strong emphasis on **commercialisation and the use of space-derived data**. It argues that Baden-Württemberg should use satellite data to support the development of new digital services and business models, and to drive innovation beyond the space sector itself, including in areas such as autonomous driving, cybersecurity, and climate protection. This is an important point in strategic terms: the region is not only interested in upstream technologies, but also in downstream economic value creation from space-enabled data and services. In that sense, the strategy treats space as both an industrial capability and an enabling digital infrastructure for wider economic transformation.

3. **Sustainability** is positioned as a defining regional ambition in space. The strategy argues that Baden-Württemberg should take on a leading role in environmental and climate protection through space-based services and should make sustainable space a regional hallmark. This includes support for greener propulsion approaches, the reusability of engines, climate-friendly drive technologies, and a stronger focus on protecting space systems and avoiding space debris as orbital activity increases. The state is therefore not framing sustainability only in terrestrial terms; it also applies the idea to the conduct of space activity itself, including the long-term viability of the space environment.

4. The strategy gives notable weight to **research excellence, skills, and technology transfer**. It stresses the importance of maintaining and improving scientific capability, including the education and training of future space engineers, and explicitly identifies workforce security as a regional priority. This reflects Baden-Württemberg's wider model: the space economy is expected to be underpinned by strong universities, applied research institutions, and industry-research collaboration, rather than relying solely on prime contractors or standalone public programmes. The strategy, therefore, treats research capability, human capital, and translational innovation as essential enablers of long-term competitiveness.

5. The strategy seeks to **increase the visibility, political representation, and connectedness of the regional space sector**. It calls for stronger external visibility for Baden-Württemberg as a space location, greater networking within the sector, and more collaboration with other industries. This is partly about profile and influence, but it is also about economic structure: the region wants space to connect more effectively with adjacent strengths in digital technologies, manufacturing, mobility, energy, and environmental applications. This means Baden-Württemberg sees cross-sector spillovers as central to its NewSpace positioning.

These strategic themes are then translated into a number of specific space measures:

1. One of the most important is the continuation of the Integrated Research Platform for Affordable Satellites (IRAS), which is presented as a vehicle for agile technology development and structured collaboration between industry, the University of Stuttgart, and applied research organisations (BaWü, 2023, p. 16). The intention is to continue and expand this cooperative model, with particular importance attached to adapting process technologies and achieving very low cost targets, especially in ways that are accessible to SMEs. This makes IRAS a core instrument for improving agility, cost-efficiency, and cross-sector technology transfer in the regional space ecosystem.

2. A second major strand is the strategy's programme for sustainable space. This includes support for R&D on a launch vehicle using sustainable propulsion, support for the creation of a Green Space Baden-Württemberg centre to bundle environmentally oriented space activities, and stronger university research on Sustainable Space 2050 (BaWü, 2023, p. 17). The latter includes work on technical solutions for new orbital regions, exploration missions, minimising ecological impacts, protecting space systems, and reducing space debris. Taken together, these measures show that sustainability is not treated as a rhetorical theme; it is operationalised through propulsion, institutional capacity-building, and long-term research agendas.

3. The strategy also prioritises start-up support as part of its space agenda (BaWü, 2023, pp. 17 - 18). It states that the growth in satellite constellations and data volumes is creating new opportunities for services in climate and environmental protection, autonomous systems, and cybersecurity, and it links this to state-level support under Start-up BW and the ESA Business Incubation Centre in Baden-Württemberg. The emphasis here is on enabling new firms to build digital, data-driven products and services, rather than only supporting traditional hardware activity. This reinforces the broader strategic shift toward NewSpace and the commercial exploitation of satellite-derived capabilities.

4. Finally, the strategy underlines the need to strengthen cooperation with other sectors, including through a proposed "BW Space meets" event series intended to connect space more closely with other industry associations in the state and stimulate new innovative products (BaWü, 2023, p. 18). This reflects a recurring feature of Baden-Württemberg's approach: space is not treated only as a niche vertical, but as a source of technologies, data, and methods that can generate value across the wider economy.

Overall, the space aspects of Baden-Württemberg's strategy can be read as a regional competitiveness agenda built around five linked objectives: to modernise the space sector through digitalisation; to make sustainability a distinctive regional strength; to convert satellite data and NewSpace activity into new commercial value; to sustain research, skills, and agile innovation capacity; and to raise the visibility and connectedness of Baden-Württemberg as a space location. The result is a strategy that does not seek to replicate national space policy in full, but instead positions Baden-Württemberg as a high-value regional node within Germany and Europe, with particular emphasis on NewSpace, sustainability, and cross-sector innovation.

Baden-Württemberg's 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 Baden-Württemberg has existing strengths in the priority areas set out in their space strategy. The following segment shall seek to outline, in brief, where Baden-Württemberg already excels and where it needs to develop to meet the objectives set out in in its Strategy. Each segment will outline a strategic priority, existing strengths, and areas for development.

Start-Up Growth, Commercialisation, & NewSpace Scaling

Expertise

The region does show signs of an entrepreneurial and commercial support layer. acitoflux is a useful example of venture and investment capability explicitly active in NewSpace and deep tech. **HyImpulse** and **Atmos Space Cargo** represent the type of younger, more frontier-oriented firms associated with NewSpace. **Xylene,** and some of the region's software- and analytics-led actors, indicate that there are also newer downstream-oriented business models present. This demonstrates that Baden-Württemberg's ecosystem is not composed only of universities, research institutes, and established engineering firms.

Opportunity Area

The principal gap is not the absence of start-up activity, but the relative thinness of the scale-up layer needed to turn promising firms into durable commercial anchors:

- **Scale-up capacity rather than start-up presence alone:** A region can generate innovative companies without consistently helping them become medium-sized or globally competitive firms. The likely gap in Baden-Württemberg is the architecture around growth: market access, customer traction, growth capital, procurement pathways, and the commercial support needed to move beyond technical proof points.
- **Commercial productisation of technical excellence:** Many of the region's organisations appear highly capable technically. The challenge is to ensure that this technical strength is turned into products and services that can be sold repeatedly, not only into bespoke engineering contracts or research-driven work. This is especially important if the strategy is to deliver in digital services, sustainability, and affordable mission architectures.
- **Visibility and bankability:** The strategy is right to emphasise visibility and networking. For younger firms, one of the practical constraints is not invention, but recognition by investors, customers, and public buyers. Baden-Württemberg's opportunity is to make more of its NewSpace firms legible as commercially credible, investable, and partnership-ready businesses.

Digitalisation & Satellite-data-Enabled Business Models

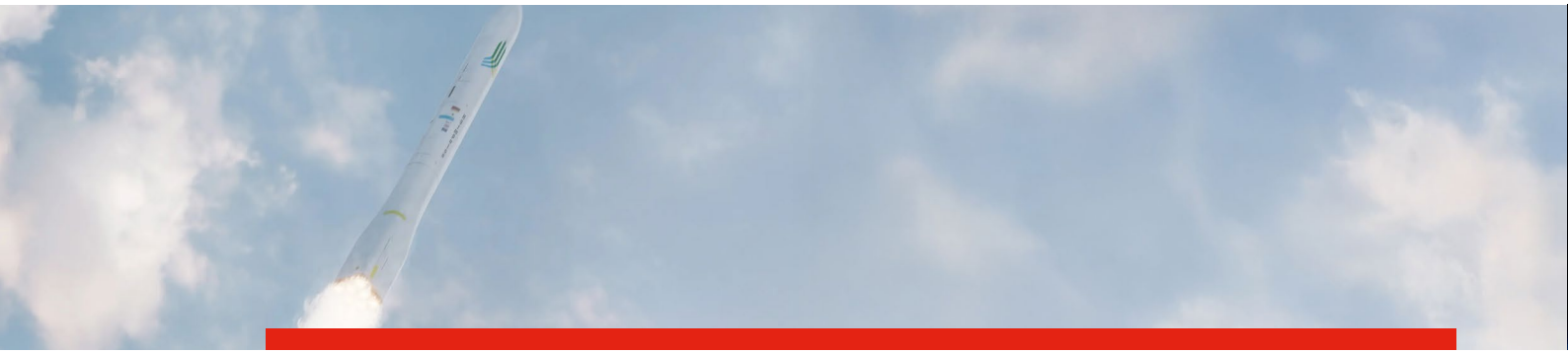
Expertise

Baden-Württemberg has a credible digital foothold, but it remains narrower than its upstream base and thinner than the strategy's ambitions imply. The regional ecosystem includes organisations able to support software, modelling, geospatial analysis, mission data handling, and digital applications. Illustrative examples include Altair Engineering, Spyrosoft, Xylene, NavPos Systems, and GTD System & Software Engineering, Taken together, these organisations show that Baden-Württemberg already has a strong base from which more advanced satellite-data exploitation and downstream product development could grow.

Opportunity Area

The principal gap is not the absence of digital competence, but the need to convert a technically credible set of capabilities into a broader, more commercially mature downstream layer that can deliver the strategy's ambitions around satellite-data-enabled business models and digitally enabled growth:

- **Application-layer scaling:** Baden-Württemberg has organisations that can process, model, analyse, and visualise data, but the ecosystem still appears stronger in enabling tools than in a thick cohort of companies turning space-derived data into commercial services. The strategic challenge is, therefore, to grow firms and propositions that sit closer to the customer and the market, especially in areas such as climate intelligence, industrial monitoring, mobility, and secure geospatial services.
- **From technical workflow to market-facing service:** A region can be strong in engineering software, mission tools, and analytics without necessarily capturing substantial downstream value. The gap here is productisation. Baden-Württemberg appears capable of supporting technical workflows around data and missions, but less visibly populated by firms packaging these capabilities into scalable services that can be adopted routinely by non-space customers.
- **Demand-side absorption across the wider economy:** The strategy's digital ambition depends not only on supply, but on uptake across Baden-Württemberg's, Germany's, and the wider industrial base. The opportunity is to strengthen the connection between space data and the region's non-space strengths, so that digitalisation becomes a route to new market demand rather than a capability that remains largely internal to the space and engineering community.



Sustainable Space, Environmental Services, & Responsible Operations

Expertise

Baden-Württemberg has meaningful building blocks for a sustainability-led space proposition. HyImpulse provides a clear example through its work on hybrid, paraffin-based propulsion and launch systems, aligning directly with the strategy's emphasis on greener propulsion approaches. Atmos Space Cargo adds capability around return-from-orbit systems, re-entry, and in-space research and manufacturing, which is highly relevant to questions of mission efficiency, reuse, and new sustainable mission architectures. Fraunhofer EMI brings research and engineering capability relevant to spacecraft testing, survivability, and system-level performance, while Fraunhofer IPA contributes manufacturing, coatings, testing, and industrial process capability that could support more efficient production and materials development. Organisations such as AZUR SPACE Solar Power, ASP Equipment, and Von Hoerner & Sulger further reinforce the regional base in photovoltaics, propulsion components, power systems, and payload-related engineering. Baden-Württemberg does have real capability that could underpin a sustainable space agenda.

Opportunity Area

The principal gap is that these capabilities do not yet appear to add up to a fully developed, system-level sustainable space proposition. The region has strong pieces, but less evidence of a broad cluster that combines green technologies, responsible operations, and downstream environmental value creation into a recognisable whole:

- **From technical inputs to a coherent sustainable space offer:** Baden-Württemberg has relevant strengths in propulsion, power, manufacturing, return systems, and research, but these appear somewhat dispersed. The opportunity is to connect them into a clearer regional proposition around sustainable space, rather than allowing sustainability to remain a useful narrative attached to isolated technical capabilities.
- **Operational responsibility beyond green hardware:** Sustainable space increasingly includes debris awareness, end-of-life planning, orbital responsibility, survivability, and protection of the space environment. Baden-Württemberg has some relevant technical foundations, but less visible depth in dedicated service-layer activity around debris, orbital safety, or responsible operational support. The gap is therefore one of operationalisation, not just technology.
- **Environmental services as a commercial growth area:** The strategy links sustainability to broader environmental and climate applications. While the region has some digital and geospatial actors that could contribute here, there is less evidence of a broad cohort of firms already monetising space-enabled environmental services at scale. The opportunity is to translate technical capability into stronger downstream environmental products and services.

Affordable Satellites, IRAS, & End-to-End System Integration

Expertise

Baden-Württemberg is particularly strong in the enabling capabilities that sit behind an affordable-satellite agenda. The region includes firms with credible hardware, subsystem, software, testing, and manufacturing expertise. TESAT is a major example, with capabilities spanning communications systems, payload design, photonics, RF electronics, optical relay systems, testing, and software. Von Hoerner & Sulger contributes payload design, propulsion components, deployment mechanisms, optical sensors, and testing services. ASP Equipment and AZUR SPACE Solar Power reinforce the base in power systems, photovoltaics, and engineering, while DIOPTIC, AXTAL, COMTRONIC, and Spherea add further depth in optical materials, photonics, radio electronics, control electronics, payloads, onboard processing, and testing. Astos Solutions contributes satellite platform design, mission design, and simulation software, and the University of Stuttgart Institute for Space Systems adds research, R&D, and skills development that underpin longer-term system capability. This is a serious upstream and technical foundation.

Opportunity Area

The principal gap is not component capability. It is the need to turn strong subsystem and engineering depth into more repeatable, integrated, end-to-end mission capability, consistent with the strategy's emphasis on affordable satellites and collaborative development:

- **System integration density, rather than component excellence alone:** Baden-Württemberg appears well supplied with organisations that can contribute parts, software, engineering, and testing. The thinner layer is end-to-end integration: actors that routinely assemble these capabilities into complete, affordable, repeatable satellite products and missions. That distinction matters because strategies built around affordability and agility depend on the ability to integrate, qualify, and deliver consistently, not only on technical excellence at subsystem level.
- **Operational follow-through across the asset lifecycle:** Affordable satellites also require mission planning, ground support, mission control, and operational continuity. Baden-Württemberg has some relevant assets here, but the operational layer still appears thinner than the underlying engineering base. The opportunity is to strengthen the full mission chain, from design through to operation and service delivery.
- **Industrialisation for speed and cost:** The strategy's Integrated Research Platform for Affordable Satellites (IRAS) project emphasis implies a need for faster cycles, cost-down production, and methods that can support SME participation. Baden-Württemberg has excellent manufacturing and engineering capability, but the opportunity is to align this more directly with modular architectures, quicker qualification routes, and more routinised delivery models that make affordability a sustained ecosystem characteristic rather than an occasional project outcome.

Skills, Research Translation, & Commercial Workforce Depth

Expertise

Baden-Württemberg is strong in research and technical capability development. The University of Stuttgart Institute for Space Systems is an obvious anchor, with research, R&D, and skills-and-training roles. Aalen University contributes applied research and workforce development. Fraunhofer EMI and Fraunhofer IPA add further depth in research, commercial R&D, testing, engineering, manufacturing, and industrial process capability. This gives the region a substantial knowledge base and a credible platform for longer-term talent development.

Opportunity Area

The principal gap is less at the research layer and more in the translation of technical excellence into a broader commercial and operational workforce suited to the strategy's ambitions:

- **A broader role mix for a changing sector:** Baden-Württemberg has engineers, researchers, and technical specialists. But a region pushing toward digital services, sustainable space, affordable missions, and New Space scaling also needs more people in product, operations, business development, regulation, programme delivery, and customer-facing roles. The opportunity is to broaden the workforce profile around the existing technical base.
- **Translation structures, not only education structures:** Strong institutes matter, but they do not automatically produce strong commercial outcomes. The strategic need is to improve the pathways between research capability, venture formation, industrial adoption, and scaled delivery, so that research excellence translates more consistently into market capture.
- **Retention and circulation of scale-up talent:** Regions with strong research systems can still struggle to build and retain enough commercially experienced growth talent. Baden-Württemberg's opportunity is to ensure that its ecosystem can support the people needed not just to invent and test, but to scale, sell, operate, and grow.

Summary

Baden-Württemberg is distinguished by deep industrial competence, strong applied research, and a concentrated set of regional hubs spanning satellite manufacturing, satellite communications, propulsion, mission design, and space systems research. Its role within the wider German and European space economy is as a high-value regional node: one that contributes critical enabling technologies, specialist engineering, research infrastructure, and mission capability into broader national and European systems. This gives the region a strong legacy base in conventional space activity, underpinned by strengths in advanced manufacturing, precision engineering, propulsion, telecommunications, and scientific research.

The Baden-Württemberg aerospace strategy seeks to build on that legacy by repositioning the region for a more digital, sustainable, and commercially dynamic space economy. The ecosystem evidence suggests that Baden-Württemberg already has much of the technical foundation needed to support this strategy. It appears particularly strong in upstream engineering, specialist subsystem capability, testing, manufacturing, propulsion-related activity, and research-led innovation. It also shows credible emerging strength in areas such as launch, return from orbit, mission design, and frontier NewSpace activity. However, the main challenge is not whether the region has capability in general, but whether it can convert that capability into a more complete and commercially mature ecosystem aligned with its strategic ambitions. The clearest gap areas are:

- **Digitalisation and satellite-data commercialisation:** Baden-Württemberg has a credible digital base, but it is still thinner than its upstream strength. The main gap is in scaling downstream, customer-facing products and services that turn satellite data into repeatable commercial value.
- **Sustainable space as a joined-up proposition:** the region has strong technical ingredients in propulsion, return systems, manufacturing, and research, but these do not yet appear to form a broad, system-level sustainable space cluster spanning green technologies, responsible operations, and space-enabled environmental services.
- **Affordable satellites and end-to-end integration:** Baden-Württemberg is strong in subsystem and engineering capability, but appears thinner in the layer of actors able to integrate, operate, and repeatedly deliver complete, affordable mission architectures.
- **Start-up growth and NewSpace scaling:** entrepreneurial activity is present, but the scale-up layer remains relatively narrow. The key challenge is helping promising firms move from technical credibility to durable commercial growth through stronger market access, customer traction, and growth support.
- **Skills and research translation:** the research base is a clear asset, but the region will need a broader commercially oriented workforce, including product, operations, regulatory, and business-development capability, if it is to deliver on its downstream and NewSpace ambitions.

Overall, Baden-Württemberg appears well positioned to remain one of Germany's leading space regions. Its strongest near-term advantage lies in the depth and quality of its engineering, research, and industrial base. Its longer-term success, however, will depend on how effectively it can translate those strengths into broader commercial capture: scaling NewSpace firms, growing downstream digital and environmental services, building more repeatable integrated mission capability, and turning cross-sector cooperation into sustained market demand. In that sense, Baden-Württemberg's opportunity is not to replicate national space policy at regional level, but to become an increasingly complete, visible, and strategically differentiated regional engine within Germany's and Europe's evolving space economy.

Conclusions

The report finds that Baden-Württemberg has a highly capable and strategically significant regional space ecosystem, with a strong position built on industrial competence, applied research, and concentrated regional hubs spanning satellite manufacturing, satellite communications, propulsion, mission design, and space systems research.

Its role within the wider German and European space economy is that of a high-value regional node: one that contributes critical enabling technologies, specialist engineering, research infrastructure, and mission capability into broader national and European systems. Baden-Württemberg therefore enters the present decade not as a region lacking technical substance, but as one seeking to adapt a strong legacy base to a more commercial, digital, and sustainability-driven era.

A central finding of the report is that Baden-Württemberg's strength lies in the depth and concentration of its underlying ecosystem. The region shows substantial capability in advanced manufacturing, specialist subsystem supply, propulsion-related activity, testing, telecommunications, mission design, and research-led innovation. At strategy level, it has also articulated a coherent agenda linking digitalisation, sustainability, affordable satellites, NewSpace growth, skills, and cross-sector visibility. This gives Baden-Württemberg a strong foundation from which to reposition itself for the next phase of regional and European space development.

At the same time, the report shows that Baden-Württemberg's challenge is one of commercial conversion, system integration, and ecosystem broadening. In several priority areas, the region already has the technical base required for success. The more difficult task is to ensure that these strengths are translated into repeatable digital products and services, stronger scale-up capacity for NewSpace firms, a more coherent sustainable-space proposition, more integrated affordable mission architectures, and a broader commercial and operational workforce able to support growth. The issue is therefore not simply whether Baden-Württemberg can develop strong technologies, but whether it can package, scale, and operationalise them more effectively.

The report also suggests that Baden-Württemberg is strongest where it builds on what is already distinctive rather than trying to replicate a full national space architecture. That includes advanced engineering, subsystem capability, propulsion and testing, affordable satellite-related enabling technologies, and cross-sector innovation around digital and sustainability themes. The region's next phase of success is therefore likely to depend on how effectively it combines industrial depth and research excellence with stronger productisation, downstream business models, commercial visibility, and broader market demand.

Opportunities in Baden-Württemberg

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

Collaboration opportunities are strongest where Baden-Württemberg already has deep technical or industrial capability but where partnership can help accelerate commercialisation, integration, or downstream application. This is particularly evident in advanced manufacturing, subsystem development, propulsion-related activity, affordable satellites, digitalisation, and sustainable-space themes. Baden-Württemberg appears especially well positioned for collaborative activity that links strong upstream capability to demonstrators, new service models, environmental applications, or cross-sector industrial innovation.

Foreign direct investment opportunities are strongest where Baden-Württemberg has substantial engineering and research credibility but would benefit from stronger commercial acceleration, scale-up support, or market-facing ecosystem layers. This includes NewSpace firms, digital and satellite-data-enabled business models, environmental services, and commercial architectures around affordable missions. For inward investors, the regional proposition is likely to be strongest where capital can help bridge the gap between technical capability and larger-scale market capture.

Export opportunities are most evident where Baden-Württemberg already has internationally relevant capability in specialist engineering, satellite communications, propulsion-related systems, testing, photonics, payload-related technologies, and advanced manufacturing inputs. The region's export strength appears strongest where these capabilities can be positioned not just as isolated components, but as part of high-value, mission-critical, and technically reliable solutions.

Capability-development opportunities arise in those areas where Baden-Württemberg has clear strategic ambition but still needs stronger enabling layers to secure long-term leadership. This includes scale-up architecture for growth firms, stronger downstream digital and environmental services, clearer system-level sustainable-space positioning, more end-to-end mission integration capability, and a broader commercial workforce around the existing research and engineering base. For organisations looking to build, invest, or partner in Baden-Württemberg, these areas may offer the most strategically significant opportunities to shape the next phase of ecosystem development.

Closing Conclusion

Overall, the report suggests that Baden-Württemberg is exceptionally well positioned to remain one of Germany's most important regional space ecosystems, but that its next phase of success will depend on how effectively it converts existing strength into greater commercial maturity, integration, and market reach. Baden-Württemberg's strongest opportunity lies not in replicating capabilities it already has in depth, but in linking industrial concentration, research excellence, and strategic ambition to stronger service models, clearer propositions, and wider market adoption. For collaborators, investors, and international partners, this makes Baden-Württemberg an attractive proposition: a technically powerful regional 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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