

# MARKETS

**GERMANY**

Insights into Europe's Biggest Economy 1/23



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COMPLEXITY**

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## UNLOCKING GERMANY'S HIDDEN HIGHLIGHTS

There are fabulous business locations in surprising places dotted all over Europe's largest economy. The trick is finding them – and Germany Trade & Invest holds the key.

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Sales of heat pumps  
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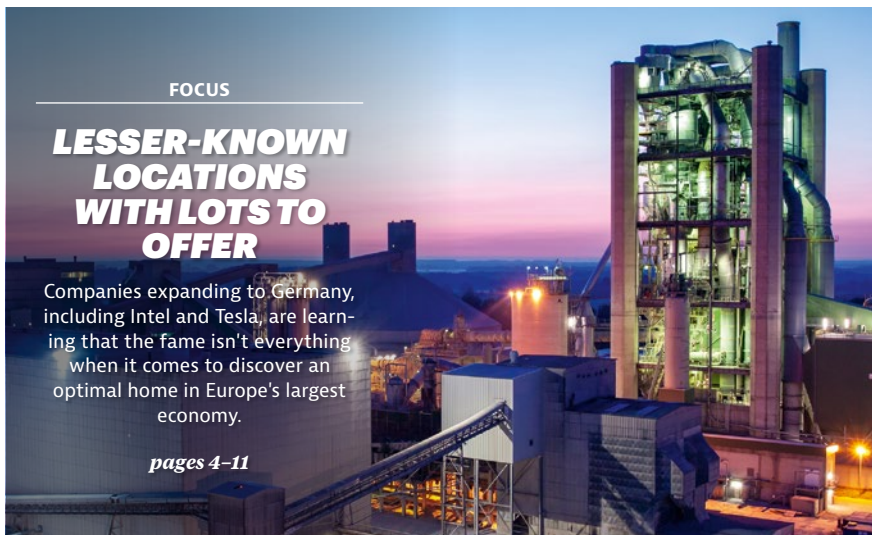


## FOCUS

# LESSER-KNOWN LOCATIONS WITH LOTS TO OFFER

Companies expanding to Germany, including Intel and Tesla, are learning that the fame isn't everything when it comes to discover an optimal home in Europe's largest economy.

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Germans have fallen in love with networked domestic devices within their own four walls.

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Competition for critical raw materials is driving the huge German market for metal recovery.

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## CLIMATE



## Sponge Cities

Germany's urban environments are adapting to water shortages and climate change.

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Federal Ministry  
for Economic Affairs  
and Climate Action

on the basis of a decision  
by the German Bundestag



**»In this issue, we're  
delighted to take  
you on a tour of  
hotspots waiting to  
be discovered.«**

**Dear Reader,**

As many of you might know, Germany is a more decentralized country than most of its European neighbors. That means clusters of excellence and pockets of potential are distributed a bit more evenly. Many business locations that aren't household names abroad have a tremendous amount to offer international companies expanding to Germany. Intel, for instance, found one such place in the eastern city of Magdeburg last year for its huge new production facility. So in this issue of *Markets Germany* we're delighted to take you on a tour of some other hotspots waiting to be discovered. That's one of the main things we do here at Germany Trade & Invest: help businesses from abroad find their ideal locations.

One sector that's red hot wherever you go in Germany is heat pumps. Concerns about heating prices and reliability have led to a veritable run on the market and created lots of space for new players. Even *The New York Times* noted the trend in a major article in December 2022 on the industry. But this February issue also contains some escapism in the form of an in-depth look at the new film industry. Germany's generous film subsidies and major studios like Babelsberg are familiar to those in the movie biz, but the cinematic action doesn't stop there. Partly because of coronavirus restrictions, demand has risen incrementally for virtual studios and all sorts of state-of-the-art visual effects trickery. Thus, we hope you'll find this issue both entertaining and informative.

**Dr. Robert Hermann, CEO**  
Email: [invest@gtai.com](mailto:invest@gtai.com)



# ONE TO WATCH

Photo: ZPlanA/Presse



## LUBOMILA JORDANOVA: COFOUNDER AND CEO OF PLAN A

Few people in the greentec start-up scene in Berlin have a more impressive track record than Lubomila Jordanova. The Bulgarian-born entrepreneur cofounded Plan A in 2017, a machine-learning platform that uses the latest scientific methods to automate clients' ESG reporting and create tailored CO2 reduction plans based on corporate emission profiles.

Now in her mid-thirties, Jordanova has a shelf-full of accolades: She was an Obama Leader Europe 2022 and a Marshall Fund Fellow 2022, an MIT Innovator Under 35 Europe in 2022, and one of business newspaper *Handelsblatt's* Top 50 Women in Tech in 2021. She also serves as a board member for bitkom, Germany's digital industry association.

Plan A's carbon accounting software has been used by over 400 companies since its launch. Its platform is a centralized data hub of more than 1,000 decarbonization solutions and activities, best practices and a network of service providers and sustainability experts.

Jordanova anticipates "rapid growth in terms of revenue and personnel in 2023" and says the focus will be on "deepening our AI expertise, which will allow Plan A to offer its decarbonizing tools to a wider range of economic sectors." She adds: "Berlin is one of the most important innovation hubs, not only in Germany but also in global terms. It's the perfect place for a greentech company because it has both scientific expertise and a strong tech scene."

### Quick facts

<b>NAME</b>	Lubomila Jordanova
<b>JOB TITLE</b>	CEO
<b>NATIONALITY</b>	Bulgaria
<b>QUALIFICATION</b>	Masters in Management
<b>PRIOR EXPERIENCE</b>	Investment banking, venture capital and fintech in Asia and Europe
<b>COMPANY NAME</b>	Plan A
<b>LINK</b>	<a href="https://plana.earth">plana.earth</a>
<b>LOCATION</b>	Berlin HQ, offices in London, Paris, Munich
<b>INDUSTRY</b>	Greentech



The future is looking increasingly bright in some lesser-known locations. In Magdeburg, a massive expansion by Intel and a great R&D landscape are expected to attract other companies to the eastern German city.

### **ONE GERMAN USP IS DECENTRALIZATION**

Germany's unique economy reflects the country's political structure as a federation of 16 regional states. The federal system generates friendly competition, resists homogeneity and monopolies, and promotes experimentation. As a result, Germany has an unusually large number of well-developed locations that vie with one other to attract international business expansions. Many locations are oriented around the needs of specific industries and new business trends. Sometimes multiple regions join forces to form well-connected and sustainably positioned business networks. International companies from a variety of sectors and with all manner of specialties can hope to find an optimally suited German location for their plans.



# GERMANY'S HIDDEN HIGHLIGHTS

Berlin and Bavaria are the two best-known places in Germany internationally. But there are numerous less familiar hotspots dotted throughout the country, and expansion-focused companies are finding that it pays to widen their searches.

**U**ntil recently, some international companies may never have heard of the eastern German city of Magdeburg. But when the US chip manufacturer Intel decided in 2022 to build its new EUR 17 billion megafab production facility in this eastern German city of a quarter of a million inhabitants, Magdeburg was instantly put on the global map. Big time.

In Germany, medium-sized companies that are world market leaders in their market segments are known as “hidden champions.” But the country also has plenty of “hidden champion locations” offering uniquely attractive conditions for doing business. These hidden highlights are scattered all over Europe’s largest economy, and it pays for international businesses to know about them.

In Germany’s northernmost regions, a number of medium-sized cities and even smaller towns and communities have become a center of attention for companies in the renewable energy and logistics sectors. Not only do they offer direct access to major seaports, they have a modern, renewables-friendly energy infrastructure that is attracting industrial companies working on their green transformation.

To the south, modest-sized cities are becoming magnets for international tech

companies due to the high density of excellent universities and outstanding research institutes. Tübingen, for instance, is a center of innovation for future technologies such as artificial intelligence. And in Bavaria, there are lots of relatively obscure business locations outside of Munich, where companies can find large plots of land with excellent infrastructure and special funding programs to support their expansion into Europe.

In western Germany, traditionally the heartland of heavy industry in Germany, completely new initiatives and networks are now emerging and will transform the economic landscape. Case in point: the Circular Valley in Wuppertal, where start-ups and corporations from all over the world network and collaborate to create solutions for the circular economy. Or the town of Wetzlar,

which brings together everyone who is anyone in the optical and electrical engineering industry in Germany.

And to take another example in the east, the satellite towns surrounding Berlin are also developing very dynamically. The area gained global recognition in 2021, when US carmaker Tesla chose the town of Grünheide as the location for its first European gigafactory. The list could go on and on.

## Variety is the spice of success

As these examples show, the Federal Republic of Germany is relatively decentralized in terms of both political authority and economic power, especially when compared with its neighbors. Whereas most European countries may only have a few business metropolises, Germany offers a wide choice of medium-sized and specialized locations.

High-tech companies in rural areas that might be considered parochial are not an unusual phenomenon. Foreign businesspeople are often pleasantly surprised when they realize they can find optimal locations in smaller, less intensely industrialized, lower-cost towns.

This is one of Germany’s unique selling points for multinationals, industry leaders and innovative start-ups looking to set up

## THE BOTTOM LINE

Germany’s economy is comparatively decentralized. Its many thriving and well-connected local economic centers offer excellent conditions for ambitious and specialized business expansion projects.



Strong partner for the textile industry: Digitization throughout the textile value chain is becoming increasingly important. As an industry-related research institution, Sächsisches Textilforschungsinstitut e.V. (STFI) [www.stfi.de](http://www.stfi.de) in Chemnitz (Saxony) recognized the strategic importance of digitization for the textile industry and began to establish its own area of expertise several years ago.



Ralph Lauxmann President HORIBA Europe GmbH and Dr. Ingo Benecke Managing Director HORIBA FuelCon GmbH at the opening ceremony of the new HORIBA eHUB in Magdeburg-Barleben.

photo: HORIBA Europe GmbH,  
W. Schmidt-Chemnitz

shop in Europe. “Regional disparities in economic infrastructure and living conditions are much less pronounced in Germany than in other, more centrally organized countries,” explains Jörg Lahner, professor of economic development and regional economics at the University of Applied Sciences and Arts (HAWK) in Hildesheim, northern Germany.

Furthermore, the 16 regional states that make up the country engage in friendly competition with one another. Central political decision-makers ensure that no region misses out when it comes to the distribution of investment and the development of critical infrastructure such as universities, research facilities, transport links, energy supply and digital connectivity.

But above all, says Lahner, it’s Germany’s strong tradition of small and medium-sized

enterprises (known as the *Mittelstand*) dotted all over the country that anchors regional economic growth. “In Germany, you might go hiking in a rural region and along the way pass the locations of two world market leaders,” jokes the economics professor.

#### **SMEs drive economic development**

Traditional SMEs located off the beaten track in Germany have a vested interest in strengthening the economic structure in the places they call home, thereby attracting other investors and entrepreneurs. “These companies keep local economic policy on its toes. Self-confident entrepreneurs set high standards and drive the economic development of their locations,” says Lahner.

Two examples are transport infrastructure and energy supplies. Hidden champions work with schools and universities, research

institutions and local political leaders. And they are continually building up their network of suppliers at home and abroad. This dynamic allows for economic clusters and powerhouses to emerge all over Germany. These local hubs then network with each other and outside Germany, cooperating with international partners.

At first glance, this may make Germany’s economic structure seem overly complex. But in times when many European companies are looking to shorten international supply chains and strengthen regional value chains, Germany’s diverse and decentralized hotspots offer a huge advantage. International investors and entrepreneurs often find themselves “spoiled for choice” when it comes to finding attractive locations, even if they have very high standards and specific requirements.

## **“INTERNATIONAL COMPANIES ARE SPOILED FOR CHOICE IN GERMANY.”**

Oliver Seiler is director of mechanical and electronic technologies at Germany Trade & Invest (GTAI). He explains how GTAI supports international businesses in choosing a location to support their expansion plans.

**Oliver, Germany's economic structure with its multiple decentralized locations and industry clusters can initially seem confusing to foreign investors. How can GTAI help?**

**OLIVER SEILER:** It's usually the case that companies, especially in the high-tech sector, have very specific requirements for a location. That's why we as the German government's international business promotion agency always look for suitable sites throughout the country based on the individual, specific needs of the respective companies. With the German economic landscape changing very dynamically and new industrial centers and clusters constantly emerging, it's important for businesses to have a partner who's aware of the latest developments.

**How exactly does the search process work?**

**OS:** First, we talk to the companies to find out what combination of location factors is decisive for them. Do they need a particularly large site? Is the connection and proximity to certain markets or business partners important? How about the energy supply or access to special sources of financing, sector-specific know-how or skilled workers? We use this information to draw up a project profile.

**So, this information forms the basis for a site search?**

**OS:** Yes, exactly. Our next step is to contact the economic promotion agencies of the considered regional states to find suitable industrial clusters, business parks and sites for the business expansion project. Then, we



make a preliminary selection which we present to the companies. They are often surprised at how many suitable locations we can offer. In Germany, you can find something that matches every need, often several alternatives. International investors are spoiled for choice here.

**How long does this process take?**

**OS:** We know that speed is of the essence. In the case of a large high-tech expansion project to Germany last year, we managed to collect ten suitable offers within just three days.

**What happens next?**

**OS:** Once the company has selected one or more locations from our shortlist, we establish contact with local business promoters, service providers and business partners and organize on-site visits. In this way, the companies quickly find out whether and how they can go about implementing their projects. And they can clarify directly with the local contacts whether, for example, the municipalities are prepared to make additional land available or to invest in the further expansion of the infrastructure, if necessary.

**What factors are the most decisive in the selection process?**

**OS:** That depends. But we have noticed that the topics of renewable energy and supply of raw materials are currently very important for many companies when deciding where to locate. Not just the supply of electricity, but water supply, sustainable waste disposal and recycling structures for critical raw materials.

# 4

## **FOUR ARGUMENTS FOR GERMANY'S "SMALL-TOWN" BUSINESS LOCATIONS**

### 1

#### **Decentralized structure is a good fit for digital business models**

As economies and industries worldwide undergo digital transformation, they are also embracing less unitary and more flexible ways of working. Germany has many excellent regional role models for decentralized location strategies.

### 2

#### **Germany's rural areas are well connected, both inside and outside the country**

Good transport links, digital infrastructure and connections to the larger metropolitan regions in their vicinity ensure Germany's more rural areas also benefit from the country's good economic infrastructure and can be integrated into European and international value chains.

### 3

#### **Special funding for peripheral locations**

Many of the more rural economic regions also benefit from special development funding either from the state itself, the national government or the European Union.

### 4

#### **Local, national, international**

Many of Germany's less centrally located companies – often established, small to medium-sized enterprises that form part of Germany's Mittelstand – have a long tradition as global “hidden champions.” They are usually fully integrated into international value chains and are open to cooperation with both international and domestic business partners.

# GROWTH OPPORTUNITIES: GREAT LESSER-KNOWN LOCATIONS IN GERMANY

## 01 HEIDE

**INHABITANTS** 21,844

**REGIONAL STATE** Schleswig-Holstein

**SPECIAL FEATURES** This northern coastal region offers plenty of open space and direct access to renewable energy from offshore wind farms.

**PARTICULARLY SUITABLE FOR** Cleantech companies and energy-intensive businesses looking to decarbonize production

**DESCRIPTION** The northern region is working to make renewable energy 100 percent available to businesses. To this end, more than a hundred national and international partners from science, industry, agriculture and the service sector are cooperating in Heide on projects to decarbonize industry and transport. "We are working to establish a Clean Energy Valley here," explains

Dirk Burmeister, CEO of the Heide Development Agency. Swedish Northvolt intends to build a battery factory for electric cars in Heide. The Swiss building materials manufacturer Holcim plans to build its first decarbonized cement plant on the German coast. And French energy giant EDF wants to produce green hydrogen (H2) here with its subsidiary Hynamics. To this end, it's entering into a joint venture with the Danish wind power specialist Ørsted and the Heide refinery, which belongs to the British raw materials group Klesch. Together they want to build a wind-powered electrolysis plant for the production of H2. Business goes where it can find a secure supply of green energy, "but it's equally important to be able to offer a whole ecosystem of sustainable suppliers and business partners," explains Burmeister.



Photo: Holcim/Press

## 02 BREMERHAVEN



Photo: BIS Wirtschaftsförderung/  
Fotograf Wolfhard Scheer

**INHABITANTS** nearly 120,000

**REGIONAL STATE** Bremen

**SPECIAL FEATURES** Bremen's smaller sister city Bremerhaven operates one of the largest container ports in Europe with production areas in the immediate vicinity.

**PARTICULARLY SUITABLE FOR** Companies from the renewables sector, logistics companies, food industry and start-ups

**DESCRIPTION** The traditional maritime city is now focused on becoming a "science city."

That means companies settling on Germany's north coast can benefit not only from excellent port infrastructure but also from the renowned Alfred Wegener Institute for Polar and Marine Research, the Fraunhofer Institute for Wind Energy and Energy System Technology, the Institute for Maritime Transport and Logistics and the various institutes of the local university. Bremerhaven is also pursuing the goal of becoming a leading test hub and center of excellence for hydrogen and fuel cell technologies.

## 03 LINGEN

**INHABITANTS** 58,244

**REGIONAL STATE** Lower Saxony

**SPECIAL FEATURES** Direct access to wind power from the coast

**PARTICULARLY SUITABLE FOR** Energy-intensive companies

**DESCRIPTION** The industrial park in Lingen offers large, contiguous industrial sites, primarily for companies in the energy sector or that produce energy-intensive goods: chemicals, metals and mechanical engineering. More than 3,800 firms work in Lingen and ensure a diverse and balanced economic structure. To supply these companies with a regular flow of green hydrogen (H2), two international energy companies, BP and Ørsted, are partnering with other firms to build a 50-megawatt electrolysis plant. Renewable electricity from Ørsted's North Sea wind plant is to be used for this. The state-of-the-art plant will be capable of producing a ton of renewable H2 per hour, some of which will be

refined on site into fuel. This could replace around 20 percent of the H2 the refinery currently produces from natural gas. The plant will be commissioned in 2024, and in phase two, an electricity output of 150 MW is planned. In the long term, BP's goal is to replace all the fossil-generated hydrogen at the Lingen refinery and thus contribute to a significant reduction in CO2 emissions in fuel production. In addition, German energy company RWE is planning to build an electrolysis test plant for the production of green hydrogen. The Lingen site plays a key role in RWE's hydrogen strategy.



Photo: Industriepark Lingen/PR



## 04 BARLEBEN/MAGDEBURG

**INHABITANTS** 9,185 (Barleben)/just under 236,188 (Magdeburg)

**REGIONAL STATE** Saxony-Anhalt

**SPECIAL FEATURES** A technology park is being set up in the area near the city of Magdeburg for development as an “e-mobility campus.” Magdeburg University of Applied Sciences is establishing its research center for sustainable drive technologies there.

**PARTICULARLY SUITABLE FOR** Companies from the mobility sector, industry and logistics

**DESCRIPTION** Around 140 companies have already settled in the Barleben Industrial Park. Plans are now underway to establish an e-mobility campus and a Center for Method Development (CMD) at the University of Magdeburg. The CMD Magdeburg sets new standards for development methods in drive and vehicle development. As early as 2023, up to 50 engineers across disciplines will establish new virtual R&D methods and processes here. In future, the center will have several test benches and laboratories for electric, hydrogen and hybrid drives. For example, the operating and ageing behavior of batteries will be investigated. The future fuel cell (FC) system laboratory will focus on optimizing the complex FC systems in the car, including air supply and water management. The Saxony-Anhalt Ministry of Economics is providing the university with a total of EUR 31 million for the CMD, of which EUR 20 million from the European Regional Development Fund.



Photo: FuelCell AG, Andreas Lander

## 05 THE “CITY WREATH”



Photo: picture alliance/dpa/dpa-Zentralbild POOL/Patrick Pleul

**INHABITANTS** Seven cities, each with between 40,000 and 100,000 residents

**REGIONAL STATE** Brandenburg

**SPECIAL FEATURES** The German capital of Berlin is booming, but things are already becoming crowded in the metropolis. The seven towns of what is called *Städtekrantz* (city wreath) in the surrounding regions offer proximity to the capital but at the same time space and development potential as well as access to renewable energy sources. Elon Musk, for example, recently took advantage of this by building his Tesla plant in Brandenburg.

**PARTICULARLY SUITABLE FOR** Companies seeking proximity to the capital's start-up scene but needing a large amount of space for their own projects

**DESCRIPTION** The cities of Brandenburg an der Havel, Cottbus, Eberswalde, Frankfurt (Oder), Jüterbog, Luckenwalde and Neuruppin have joined forces to offer companies in the Berlin area an attractive infrastructure. The medium-sized locations offer a good compromise between big city life and the advantages of a rural setting. Berlin is just around the corner but so is nature. Being at the center of innovation but still with enough distance from the hustle and bustle of the metropolis is what makes living and working in the seven regional locations so special. A hydrogen network has been set up to supply industrial companies in the region with green hydrogen. Meanwhile, start-up accelerators and technology parks have settled in the city ring around Berlin and form an axis for innovative companies and their research projects.

## 06 WUPPERTAL

**INHABITANTS** 354,572

**REGIONAL STATE** North Rhine-Westphalia

**SPECIAL FEATURES** Traditional industrial location that is transforming regional value chains to fit the circular economy

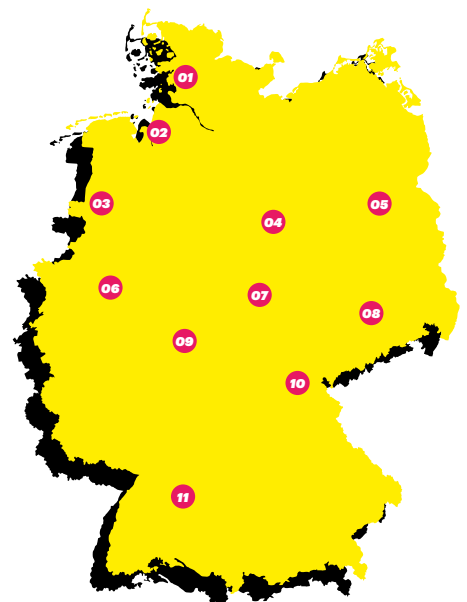
**PARTICULARLY SUITABLE FOR** Start-ups, investors and companies interested in projects implementing the circular economy

**DESCRIPTION** The “Circular Valley” in Wuppertal is set to become an international center for the regenerative economy. With universities, research centers and industrial companies from all sectors, including the recycling pioneers Remondis and DSD (Duales System Deutschland), the metropolitan area is equipped to achieve its ambitions. The initiative extends across the entirety of the Rhine-Ruhr area and

even into Belgian Flanders. The NRW Ministry for Economic Affairs and Energy and the EU support the Circular Valley, as does the French bank Société Générale. Twice a year, start-ups and investors take part in its accelerator program to develop ideas to combine new and old industries and aid the transition towards more sustainable business models. This results in successful collaborations.



Photo: Circular Valley/Presse





## 07 KYFFHÄUSERKREIS DISTRICT

**INHABITANTS** 72,964

**REGIONAL STATE** Thuringia

**SPECIAL FEATURES** The Kyffhäuser District offers large commercial areas that are located at the north-eastern border of Thuringia with direct access to the highway junction of A71 and A38 and the greater Halle/Leipzig urban area.

**ESPECIALLY SUITABLE FOR**

Industrial companies with large scale investment projects of up to 70 hectares.

**DESCRIPTION** The Kyffhäuser District is a traditional industrial location with many SMEs focused on metal, electrical and plastics manufacturing. Approximately 4,500 innovative companies, ranging from traditional craft businesses to high-tech com-

panies, form the backbone for a stable economy and labor market. Numerous suppliers to the auto industry have already settled in the area – for example, the auto-maker Mercedes-Benz is operating a plant with about 1,400 employees in the region. The nearby Nordhausen University of Applied Sciences in combination with Germany's unique system of dual vocational training ensures a pool of skilled personnel. Modern daycare centers, good schools, numerous healthcare facilities form the foundation for a great living environment for the whole family. The zoning plans have already been approved for the industrial area "Artern Unstrut". Nearby wind and solar farms provide access to green energy.



Photo: Susann Nuernberger

## 08 CHEMNITZ

**INHABITANTS** nearly 249,000

**REGIONAL STATE** Saxony

**SPECIAL FEATURES** Chemnitz is a leading research and development location for microsystems technology, sensor technology and the textile industry. It's also a future location of the HIC – Hydrogen and Mobility Innovation Center, which is a part of the National Hydrogen Center of Germany.

**PARTICULARLY SUITABLE FOR**

Technology-oriented companies from the automotive and supplier industry, mechanical and plant engineering and the textile industry

**DESCRIPTION** At the end of the 19th century, Chemnitz was called the "Saxon Manchester,"

a comparison with the English industrial powerhouse. Today, it is a modern city with a focus on auto supplier industries, mechanical and plant engineering and IT. With the Smart Systems Campus and the Chemnitz Technology Center, it offers prime conditions for tech-oriented companies, encompassing the expertise of two Fraunhofer institutes with a focus on R&D in production technology and smart systems. This is complemented by the know-how of the Chemnitz Automated Driving Alliance (CADA), as well as the industrial application-oriented Saxon Textile Research Institute (STFI). The HIC is developing into an industrial R&D and certification campus for fuel cells and alternative drives for road and rail.



Photo: HZwo e.V./Thomas Höppner

## 09 WETZLAR, CENTRAL HESSEN

**INHABITANTS** 52,969

**REGIONAL STATE** Hessen

**SPECIAL FEATURES** Wetzlar is a traditional location for companies in the optics and electronics industries.

**PARTICULARLY SUITABLE FOR** Companies in the optics and electronics industries

**DESCRIPTION** Central Hessen, the region where the 35mm camera was invented, has created the ideal conditions for local players and foreign investors alike. The unique cooperation between universities and companies in the fields of optics, electronics and mechanics is the key to success. Leading lights from business and science have joined forces to form a powerful optics cluster in western central Germany where collaboration is the key to success. Wetzlar-based companies such as Leica Camera, Leica Microsystems,



Photo: Leica Camera AG

Buderus, or ZEISS Semiconductor Manufacturing Technology (ZEISS SMT) find sales markets all over the world. Many high-performance, medium-sized companies in complementary industries have also settled in the region.

Three universities – Philipps University Marburg, Justus Liebig University Giessen and the Technical University of Applied Sciences Central Hessen (THM) – have professorships in physics and chemistry and offer accredited degree programs ranging from physics to aerospace. As a result, the region has the highest student density in Germany and STEM education is prioritized in Central Hessen (which is home to several science centers), ensuring future generations of skilled professionals. Also, numerous wind and solar parks promote green and sustainable economic growth.



## 10 HOF REGION

**INHABITANTS** 100,000

**REGIONAL STATE** Bavaria

**SPECIAL FEATURES** Companies that settle in and around the northern Bavarian city of Hof benefit from special subsidies from the federal government's so-called GRW program, which provides grants of up to 45 percent for on-site business investments.

**PARTICULARLY SUITABLE FOR** Companies from the water supply and wastewater treatment industries, from logistics, automotive, life sciences, textile and plastics processing sectors

**DESCRIPTION** The city of Hof can fall back on a long history as a business location. Traditionally, the strongest sectors are the plastics and textile industries, which have driven dynamic business development and future-ready industries and produced a wealth of innovative products. These historical strengths are today enhanced by the modern infrastructure of a forward-looking industrial and service location. The focus on the city's periphery and surrounding areas is on technological solutions for water and wastewater management. In total, more than 50 big players in the fields of business, research and institutions are concentrated here: for example, world-leading manufacturers of pumps and pump systems for water supply and wastewater treatment and disposal, manufacturers in the field of polymer-based solutions for water management as well as sealant-free paving made from recycled materials. Bowl technologies for sludge removal developed here are used in water rehabilitation projects all over the world. In addition, there are service providers in the specialist niches of hydrogeology, water testing and sewage treatment plant planning. Excellent connections to the international transport network and a tight relationship between business and science – especially through the resident University of Applied Sciences – are just some of the advantages that make Hof an interesting location for business and technological innovation. A favorable standard of living and pleasant environment for recreation round off the picture.



Photo: sergeyryzhov/stock.adobe.com

## 11 TÜBINGEN



Photo: Cyber Valley Tübingen

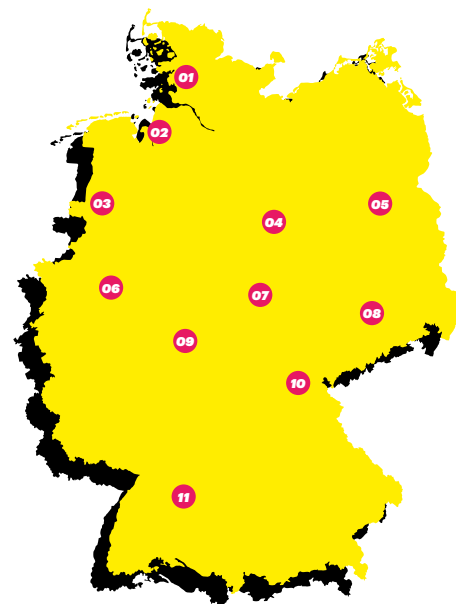
**INHABITANTS** about 90,000

**REGIONAL STATE** Baden-Württemberg

**SPECIAL FEATURES** University town with more than 28,000 students

**PARTICULARLY SUITABLE FOR** Companies that want to apply and develop artificial intelligence

**DESCRIPTION** Cyber Valley Tübingen is the largest research consortium in the field of artificial intelligence (AI) in Europe, connecting projects within the areas surrounding the cities of Tübingen and Stuttgart in southwestern Germany. It is currently developing into a creative hotspot for scientific development and lucrative innovations in the field – and is attracting both large and modestly sized companies both from Germany and abroad. The research departments of internationally active companies such as Amazon, Bosch, Mercedes, BMW and Porsche conduct research here at renowned R&D centers including the Max Planck Institute for Intelligent Systems and the universities of Tübingen and Stuttgart. The multinational engineering and technology conglomerate Bosch, for example, has announced that it will build a new campus in Tübingen to facilitate around 700 AI experts in their research. Amazon has built a research and development center in the area for around 100 employees. In a new research building with motorized, mobile laboratories that can literally go on the road, automobile companies are planning to develop solutions for autonomous driving, among other things. An excellent regional start-up and investor network exists to provide financial support to international business settlers and young innovative technology and solutions companies. The national and the regional governments jointly support the Cyber Valley AI Competence Center with EUR 20 million annually.





# Much More Than **HOT AIR**

Germany aims to be climate-neutral by 2045 and renewable heating systems are a big part of this plan. The annual target for heat pump installations was recently increased to 500,000 from 2024 onward, presenting huge business opportunities for international suppliers.

**G**ermany is changing how buildings are heated and the conversion is happening faster than planned. The Ministry for Economic Affairs and Climate Action is ramping up the expansion of renewable heating sources, which are set to replace oil and gas heating systems within the next two decades.

The potential for energy savings is great: The consumption of heating and hot water in buildings accounts for about 35 percent of Germany's total energy consumption, while the sector accounts for 40 percent of all CO<sub>2</sub> emissions generated. At the present time, there are 21 million installed central heating systems in Germany; of those, some 14 million are gas-fired and 5 million oil-fired, with many being old and inefficient. New heating

## THE BOTTOM LINE

**The market for heat pumps is growing rapidly in Germany. The federal government has defined clear goals and increased the pace. The heat turnaround in Europe's largest market is in full swing.**

technologies that are both energy-efficient and climate-friendly will power the heat transition, with heat pumps leading the way in Germany. Heat pumps extract heat from the ambient air, groundwater or ground to supply a house-

hold with hot water and heating, without the need for backup from fossil fuels. Residents of a heat pump-adapted property can expect permanently low heating and hot water costs.

For this reason, the German government has set itself the goal of installing 500,000 new heat pumps every year from 2024 onward – up from 154,000 installations in 2021. If this target is met, 6 million heat pumps will be in operation by 2030, which will put the country on track toward carbon neutrality by 2045.

Heat pumps have been growing in popularity in Germany in recent years, especially in new builds. For illustration, in 2012 just 24 percent of new buildings were fitted with heat pumps compared to 48 percent gas heating systems – ten years later, this trend has re-



The share of heat pumps in newly installed heating systems in Germany has more than doubled since 2012.

Photo: rh2010/stock.adobe.com

## GOVERNMENT SUPPORT FOR HEAT PUMP INSTALLATION

The German government promotes the installation of heat pumps with subsidies. The maximum subsidy per residential unit and calendar year is EUR 60,000. The subsidy program covers 25 percent of the costs for the purchase and installation of heat pumps. Anyone who replaces a gas heating system that is at least 20 years old, or a coal or night storage heating system with the installation of a heat pump, receives an additional bonus of ten percent of the costs.

versed: In 2021, used only around 26 percent of new heating installations were gas systems. “In January and February 2022, just under half of all installed heating systems in new buildings were heat pumps. This is a trend toward heat pumps that will not turn around,” says Robert Compton, Germany Trade & Invest’s (GTAI) sector expert for energy and environmental technologies. The figure in 2021 was 44 percent.

So far, the majority of heat pumps in Germany have been installed in newly-built detached and semi-detached houses. However, the technology can also be used to modernize existing buildings. In many cases, older radiators can be repurposed and plumbers only have to replace the individual radiators that are completely outdated.

In residential apartment blocks, a single heat pump can pivot the community to affordable, climate-friendly heating. For example, in 2014 a neighborhood in Berlin with 18 apartment buildings built between 1930 and 1960 received a new energy system,” says Björn Schreiner-macher from the German heat pump association BWP. “There, one heat pump per building was used as a heat source for heating.” GTAI’s expert Compton is also convinced: “Heat pump technology can supply every type of building with heat, even if it has so far been used mainly in new buildings and single-family homes.”

One thing is certain: In order to meet the rising demand, manufacturers in Germany will have to significantly increase their production capacities. The ongoing war in Ukraine and the

sharp rise in prices for fossil fuels are boosting demand for heat pumps further – producers and installers can barely keep up. “Industry and the trades must manage the expansion of production and installation capacities for heat pumps in the coming years so that the large demand meets an equally large supply,” emphasizes Schreiner-macher. Compton concurs: “Companies’ order books are full. Anyone wanting to install a heat pump in Germany today can expect to wait several months. This creates exciting business opportunities in Germany for internationally active suppliers.”

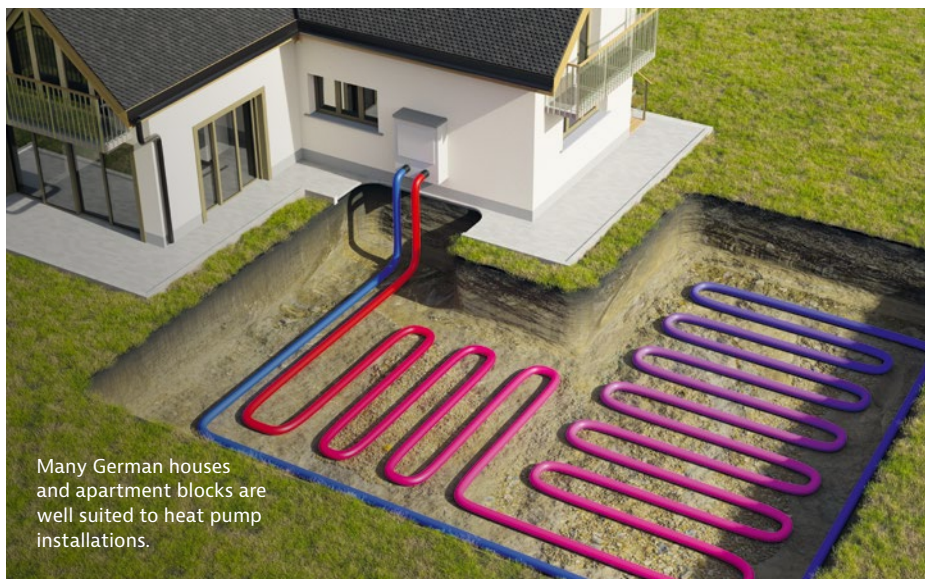
Because of climate change and geopolitical events affecting energy prices, fossil fuel-based technologies will have to be replaced sooner rather than later. Filip De Graeve, managing





**»‘Made in Germany’  
stands for  
high engineering  
quality.«**

*Filip De Graeve, managing director  
of Daikin in Germany*



Many German houses and apartment blocks are well suited to heat pump installations.

Photo: vchalup/stock.adobe.com

director of Daikin in Germany, sees this as a great opportunity. The Japanese company produces heat pumps as well as ventilation and air conditioning systems and announced at the beginning of October 2022 that it would expand its site in Germany, which the company has owned since 2008. To this end, Daikin has acquired 22,000 square meters of additional space in the southwestern German state of Baden-Württemberg. The company plans to create 500 new jobs there and at least triple its current production volume by 2025.

“Germany is the largest market in Europe,” says De Graeve, “and will become even more the most important market for heat pumps in the coming years.” The German government’s decision to provide financial support for the installation of heat pumps also contributes to this. “As a producer and developer of heat pumps and technology, we want to profit from the boom and produce close to the customers,” he says.

GTAI’s industry expert Compton agrees that it is important for producers to be close to the sales market. Producers depend on local tradesmen to know and install their products. In addition, every property owner decides for himself from which heat source the hot air and hot water should come – and customers are more likely to choose products from a company they know.

Germany offers further locational advantages: Government subsidy programs for property owners make it easier to finance a conversion, which is driving uptake of heat pump technology. “We have observed that the subsidy is working, i.e. it triggers investments

that are received by the companies and trades in the sector,” says Schreinermaier. “Furthermore, the ‘Made in Germany’ stands for high engineering quality,” adds De Graeve. “What companies develop in Germany, they can therefore also export successfully to third markets.”

Companies with a production site in Germany can also benefit from the country’s efficient export promotion infrastructure. “Export promotion in Germany is among the best in the

world,” Compton emphasizes. So the upswing of heat pump technology in Germany results in a virtuous circle for manufacturers and installers, consumers and the climate.

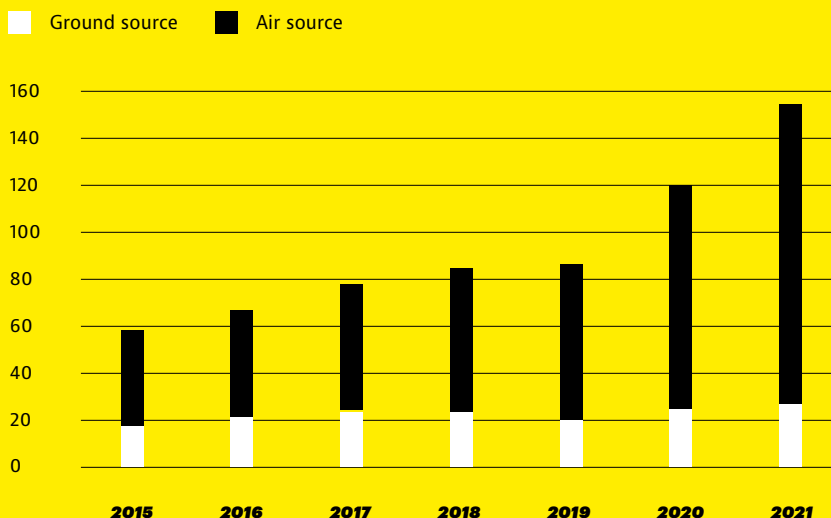


## CONTACT

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## HEAT PUMPS HAVE SURGED IN POPULARITY

Number of installed heat pumps in Germany since 2015 (in thousands)



Source: BWP



# SUNNY SKIES AHEAD

Gone are the clouds that once hung over Germany's photovoltaic sector. Concerns about energy security and the need for climate action are driving a remarkable solar renaissance in Europe's largest economy.

**I**n 2017, the German solar panel manufacturer SolarWorld went bankrupt. The casualty was symptomatic of a nationwide crash in renewable energy production. The decline in the photovoltaic (PV) sector cast a shadow of doubt over the future of "Solar Valley," a regional hub of solar panel manufacturing in the eastern German states of Saxony and Saxony-Anhalt.

Fast forward five years: The region is experiencing a wave of foreign business expansion and the German solar sector is shining brightly once more. In 2021, Meyer Burger, a leading Swiss manufacturer of PV equipment, moved into some of SolarWorld's former facilities in Freiberg. Barely a year later, it announced another round of expansion worth over EUR 250 million for its German plants. Meyer Burger aims to produce 1.4 gigawatts of solar modules in its Freiberg facility alone in 2023.

## Demand driven by Ukraine War

"The company is tackling the situation – which has also been driven by the war in Ukraine – proactively and is using the opportunity to add additional capacity in Germany," Meyer Burger's spokeswoman Anne Schneider said recently.

Meyer Burger is one of several foreign companies now jostling to enter the German PV market, which has rebounded from the decline of the last decade. Experts say the impetus to stop buying Russian natural gas in particular marked a turning point. "Demand has exploded since the war started," says Germany Trade & Invest (GTAI) analyst Tobias Rothacher, "even without additional government support or programs."

## Solar strategies, large and small

The increase in demand includes all classes of PV installations, from major industrial projects to so-called "balcony solar" modules of just a square meter or so. Rising prices for gas and electricity, coupled with a steady decline in prices for solar panel technology, have convinced more and more people to invest in power generated by the sun. "People are seeking an alternative energy source, and solar is fast and easy," Rothacher says.

The effects are visible nationwide. Solar covered 12 percent of Germany's electricity production in the first half of 2022, and in June, which was unusually sunny, it generated 22 percent of the country's total.

## THE BOTTOM LINE

Russia's war in Ukraine and a Europe-wide surge in fossil fuel prices has given the German photovoltaic sector a new – and sustainable – boost, offering plenty of opportunities for foreign companies.

## Investment opportunities abound

The German sector is particularly attractive to companies seeking to avoid the supply chain insecurities of sourcing PV panels in China. And with increasing numbers of solar manufacturers looking to build up manufacturing capacity in Germany, silicon manufacturers are also ramping up production.

"Right now, the biggest opportunity is to come to Germany and source raw materials and sell directly here," Rothacher says. "You save on logistics costs and it's secure from disruptions to the supply chain."

Major players so far include Portugal's EDP Renováveis, which acquired a majority share of German solar developer Kronos Solar Projects in the summer of 2022. And Rothacher says more such deals are in the pipeline. "It's really a fast ramp-up," explains GTAI's solar expert. "Right now, you can hardly get orders filled – in every segment."

This time around, the growth in German photovoltaic solutions is sustainable and all the indicators suggest the industry will remain prosperous for a long time to come.



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In 2021, Switzerland's Meyer-Burger, a leading manufacturer of PV equipment, moved into some of SolarWorld's former facilities in Freiberg.

Photo: Meyer-Burger/Presse

Photo: Gyula Gyukil/stock.adobe.com



# IN BRIEF

People around the world admire the spirit of invention that drives the German economy. Here we spotlight some of the trends and research projects from around Germany.

## SELF-DRIVING TRUCKS HIT THE AUTOBAHN

**An ambitious plan to get autonomous trucks operating internationally is piloting in Hamburg**

Hamburg is set to become the "number one test city in Europe for autonomously driving trucks." That's according to Gruber Logistics who are conducting a three-year test in the northern German city's huge port, in partnership with Volvo, DAF and Maersk.

Hamburg was chosen because many of its streets are already highly digitalized. The initial aim of the project, which has attracted EUR 23 million in funding from the EU, is to get at least two 40-ton trucks driving autonomously between the container port and Autobahn 7 by 2025. The long-term goal is to have driverless trucks operating via Hamburg between Rotterdam in the Netherlands and Norway.

[www.gruber-logistics.com](http://www.gruber-logistics.com)



Photo: picture alliance/dpa/ Markus Scholz

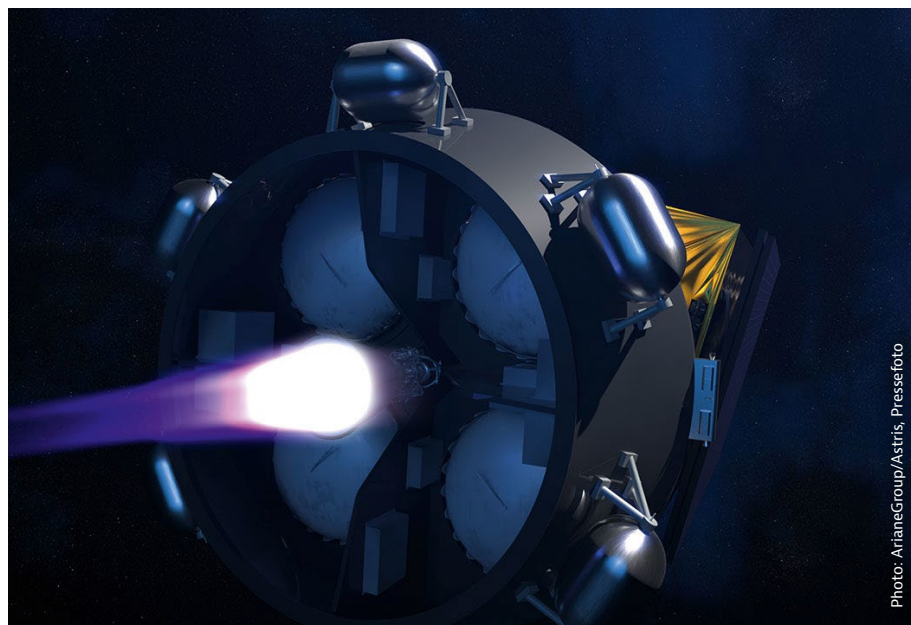


Photo: ArianeGroup/Astris, Pressefoto

## BERLIN BLASTS OFF!

**Germany's capital city joins the "new space" race**

Berlin may not be the first European city you would associate with space travel, but it has become a hive of aerospace activity. That's thanks to innovative growth companies like PTS. The new space outfit, which is on a mission to "democratize access to space," develops rover vehicles, cameras and other equipment to support potential spaceports, dwellings and other infrastructure on the moon.

PTS's ambitions got a boost in late 2021 when the ArianeGroup awarded it with a major contract as part of the development of Ariane 6, the next European heavy-lift space launch vehicle. And PTS is deeply involved in the preparations for the first European journey to the moon – and beyond. PTS CEO André Radloff says he's sure that human beings will be living on Mars as well as on the moon "within our lifetime."

[www.pts.space](http://www.pts.space)

## DIGITAL INNOVATION IN SAXONY

The eastern German regional state has been made a "digital innovation hub" for big data, AI and robotics

### »EDIH Saxony will complement existing support options for the digital transformation«

Ines Fröhlich, the state secretary for economics and commissioner for digitalization

Saxony is about to become home to a European Digital Innovation Hub (EDIH). The hubs are one-stop shops providing access to digital expertise for companies and the chance to "test before invest." The European Commission formalized the Saxony EDIH in November 2022, after the consortium qualified for final consideration. The hub will encompass key fields such as big data, artificial intelligence, robotics and cybersecurity.

"With its new and innovative services, EDIH Saxony will perfectly complement existing support options for the digital transformation of small and medium-sized enterprises as well as the administration of the Free State of Saxony," comments Ines Fröhlich, the state secretary for economics and commissioner for digitalization.

<https://edih-saxony.eu/en/>

## FULL STEAM AHEAD!

### Steam engine technology is back in fashion – for storing renewable energy

Engineers at the Zittau/Görlitz University of Applied Sciences have been studying the good old steam engine to tackle one of the most pressing engineering tasks of our time: how to store electricity generated from wind turbines and solar panels most efficiently.

A research team has conducted trials on a battery that works on the principle of pressure containers being filled with steam generated from green electricity. In August 2022, the system achieved a maximum efficiency factor of 60, which means that 60 percent of the fed-in electricity is retained when released.

"If you know that steam trains can pull very heavy freight wagons, you know that steam can contain a lot of energy," says Thomas Schäfer, one of the engineers involved. "That's why steam is an excellent choice of a storage medium for batteries."

[www.theresa.hszg.de/en/projects/tms](http://www.theresa.hszg.de/en/projects/tms)

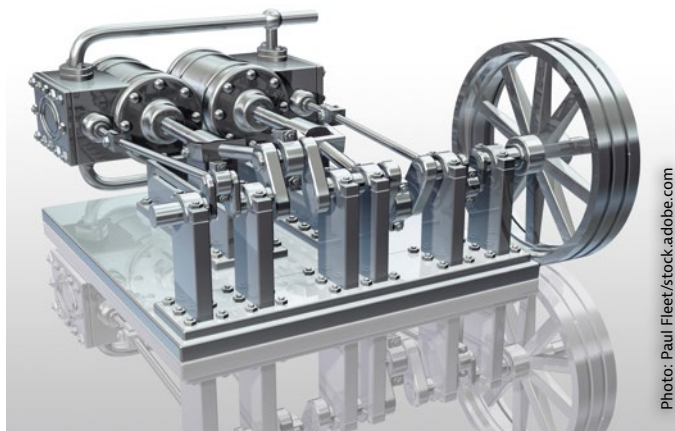


Photo: Paul Fleet/stock.adobe.com



Photo: Alexandr Bognat/stock.adobe.com

## GERMANY'S FIRST DRONE DELIVERY AIRPORT

### The vertical take-off and landing (VTOL) market will benefit from Kamenz's new drone port

Initial test flights have been made for what will become Germany's first airport for delivery drones. The "ventriport" will be located near the eastern German town of Kamenz and, when fully operational, will accommodate up to 100 drone flights a day, with each drone carrying a load of up to 100 kilos. The facility is the brainchild of the 3D-Aero network, a center of excellence involving experts from seven universities and regional states across Germany. Pending the required regulatory nods, construction of the ventriport will start in 2023 and be completed two years later. "It's astonishing that what two years ago was only abstract theory is now something we see being practically used," 3D-Aero's chief product and innovation officer Rainer Deutschmann told regional broadcaster MDR. The aim is to create a "real 3D laboratory" with drones flying to and from the nearby towns of Nardt, Rothenburg and Görlitz.

[www.3d-aero.net](http://www.3d-aero.net)



Photo: Mermaid/Presse

## DISRUPTING DISEASE

### A new class of antibody drugs could help healing inside human cells

The problem with most conventional medical treatments is that they only work between the cells of the body, not within them. Munich-based medtech company Mermaid Bio has developed a new class of antibody drugs that links nanobodies (single-domain antibody fragments) and new delivery technologies similar to the ones used in the mRNA vaccines for Covid-19 together to effectively turn diseased cells into nanobody factories capable of treating themselves.

"Antibodies dominate the world of extracellular disease targets," says Ranja Salva-moser, executive director of Mermaid Bio. "Our innovation is to combine two cutting-edge technologies to deliver therapeutics into aberrant cells in order to treat diseases at their roots." Mermaid Bio is supported by Germany's Federal Agency for Disruptive Innovation (SPRIND), which facilitates the emergence of groundbreaking technologies to tackle the major challenges of our time.

[www.mermaid.bio](http://www.mermaid.bio)



# HOME, SMART HOME

Germans have a reputation for being slow digital adopters. But when it comes to networked domestic devices for controlling everything from radiators to lamps and blinds, they are very enthusiastic. International providers of smart-tech DIY solutions can thrive in this market.

Germany is the fourth largest smart home market worldwide – the sector is expected to be worth USD 9.6 billion in 2025.



**U**nlock the door, dim the lights, turn up the heaters or send the robot vacuum cleaner off on a chore – all at the touch of a button or preprogrammed on a smartphone. Smart home applications connect and control the digital devices that make our lives more comfortable and convenient.

With sales of around USD 6.6 billion in 2021, Germany is the fourth largest smart home market worldwide. And the potential is far from exhausted. According to the Digital Market Outlook, the sector is expected to be worth USD 9.6 billion in 2025, an increase of 45 percent compared to today.

Around 40 percent of Germans already use at least one smart-home-enabled application. Another 38 percent are interested in smart light switches, light bulbs, thermostats and window sensors, according to a survey from Splendid Research in 2021. Entertainment and communication products were found to be the most popular (smart televisions and voice control systems), but temperature sensors and heating control devices were also doing well.

### THE BOTTOM LINE

Although Germans are open to smart home apps, many households do not yet have any such installations. International companies could take advantage of this market opportunity with DIY and energy-saving solutions.

“The demand for smart heating solutions is highly increasing due to the energy crisis,” reports Edwin Aartman, the German sales manager of the French smart home device producer Netatmo. Solution providers promise up to 30 percent lower costs. In addition to radiator thermostats, Netatmo also sells alarm systems and room air sensors in Germany. “Our most successful products are weather and security solutions,” says Aartman. However, the German market has a few peculiarities: “German customers prefer talking to a German-speaking support team. They generally feel more secure with German companies.”

That doesn’t mean international companies don’t have a chance in Europe’s biggest market – they just have to know how to do it right. “We have partnerships with distributors such as Tink,” Aartman reports. They also cooperate with German associations, for example with “CO macht K.O.” This initiative educates people about the danger of carbon monoxide poisoning and how to protect themselves using smart devices.

“These partnerships help us build trust on the German market,” says the Netatmo sales rep. “German consumers are a loyal audience once a brand has gained their trust.”

Furthermore, many Germans live in rented accommodation. Smart home solutions are popular because customers can easily install them – and take them along if they move. Thermostats, for example, can simply be screwed onto the standard valves of German radiators, without permission from the landlord.

That can mitigate shortages of skilled domestic appliance installers. “Manufacturers are therefore well advised to develop their products in such a way that they can be installed and configured with as few craftsmen and as much of their own work as possible,” advises Günther Ohland, chairman of the board of the SmartHome Initiative Deutschland industry association. And Ohland has another tip: Smart home products designed for seniors could be particularly successful in Germany. “They are probably the most important customer group,” in a country with an older population and falling birth rates.

Thirdly, providers in Germany should take into account the trend toward industry standards. Germans, after all, like guidelines. In October 2022, the Connectivity Standards Alliance (CSA) group of companies presented the cross-vendor industry standard “Matter 1.0” – a kind of common language via which products from different suppliers can communicate and connect.

Experts already warn that if companies want to remain competitive, they must integrate this new standard into their systems because the big home market players – Apple, Amazon, IKEA and Google – have already announced that they will be Matter-compliant.

The French company Schneider Electric also hopes to conquer neighboring markets with Matter-standardized products.

At the IFA technology fair in Berlin, Schneider recently presented its latest innovation: the first e-car charger that can be integrated into a home’s energy management system and enables users to monitor the power consumption of their cars in real time. In a time when European consumers are tightening their belts and the effects of extreme weather are being felt, it is more important than ever to reduce energy consumption – which is the core message of Schneider’s sales pitch.

### FIVE GERMAN PRIORITIES

Why did you or would you purchase smart home devices?

#### COMFORT

61%

#### SECURITY

41%

#### LOWER HEATING/ELECTRICITY COSTS

41%

#### FUN

38%

#### ENTHUSIASM FOR TECHNOLOGY

35%

### ENTERTAINMENT, COMMUNICATION AND ENERGY

What are the most popular smart home applications?

#### ENTERTAINMENT AND COMMUNICATION

63%

#### ENERGY MANAGEMENT

55%

#### BUILDING/RESIDENTIAL SAFETY

31%

#### HOME AUTOMATION AND COMFORT

28%

#### HEALTH/AMBIENT ASSISTED LIVING

11%



# TRADING ON COMPLEXITY

More and more start-ups in Germany are working on deeptech solutions – based on fundamentally new scientific-technological approaches and know-how. International businesses are already starting to benefit from this new wave of innovation.

**B**ernd Heinrichs is on the road a lot. The co-CEO of the deeptech start-up Wandelbots is currently traveling through Germany and the US to talk to investors, customers and business partners about new uses for the company's solutions. A spin-off from the University of Dresden in eastern Germany, the company has developed so-called "no-code software" that allows people without programming skills to program robots for a wide variety of applications.

With the help of Wandelbots, robotic applications from renowned manufacturers such as Universal Robots and Yaskawa are already being programmed at industrial companies including Bayer, Volkswagen, Rotop Pharmaka and Vitesco Technologies. Heady stuff from a company that was only founded in 2017.

Last year, Wandelbots raised USD 84 million in Series C funding to drive its international expansion. New York-based global tech investor Insight Partners stepped in, along with existing Wandelbots investors 83North, Microsoft, Next47, Paua, Atlantic Labs and EQT.

"We presented our solution at the Founders Forum in New York at the end of 2021, and then experienced a real investor run," Heinrichs says. He points out this owes much to the fact that Wandelbots had already managed to interest large German industrial customers in its solution: "For deeptech start-ups like Wandelbots, it is an enormously important step to be able to show their solutions in real-world use." The deeptech scene is thriving generally in Germany, he says, "because many founders specialize in B2B solutions that make the topic of deeptech tangible. And because they find partners among industrial

companies in this country to put their ideas into practice."

## Exploiting Germany's R&D excellence

Deeptech and German R&D are a natural match – both are concerned with developing pragmatic solutions for problem-oriented products based on intensive research, novel algorithms and combinations of technologies.

This complexity makes their software solutions easier to protect through patents, and more difficult to imitate than, for example, the business model of an e-commerce venture. The disadvantage is that it's often difficult for non-techies to understand exactly what the value propositions of the solutions are – and the path to market maturity is often winding.

That's why deeptech start-ups tend to emerge from universities and research institutions, where they go through the early stages of their development. "The step out of the university context is then critical to success," says Philipp Kövener, director of the trend & innovation scouting team at Germany Trade & Invest (GTAI). "At this point, the founders, who are often very technically oriented, need significant financial investments to further develop their ideas."

## THE BOTTOM LINE

Germany's tradition of practical R&D and aggressive government support is driving deeptech – and international companies can take part in this emerging sector.

## State support

The German government has recognized the importance of this segment of the economy and has launched an early-stage fund specifically for deeptech start-ups.

The Digital Hub for Applied AI in the southern German city of Karlsruhe is a major springboard. The hub is one of 12 in the Digital Hub Initiative – an honor awarded by the Ministry for Economic Affairs and Climate Action (BMWK) – and also works closely with GTAI.

It brings together start-ups, researchers and companies. For example, Wandelbots implemented one of its first robotic projects with the Volkswagen automotive group in the Digital Hub Initiative. "We are one of the big artificial intelligence locations and unique AI ecosystems in Germany, so there are a lot of deeptech start-ups here," says Josephine Simon, the digital hub manager.

The hub also establishes contact with business angels, venture capital investors and strategic investors. "We help start-ups attract funding for their projects," Simon explains, while adding that access to data and development partners is just as important as access to capital. "That's why we're also building an infrastructure here as part of the AI Alliance to help data-driven deeptech start-ups develop their ideas to market faster."

It's often productive to have various deeptech start-ups collaborate on solutions to a company's specific problem. "That's a big advantage of the hubs, especially for medium-sized companies, but also for larger corporations that want to solve a very specific problem," Simon tells us. "Because it's often not worth it for large, established software vendors



to develop a solution for a very specific use case or a single company.” Start-ups, on the other hand, benefit from being able to try out their ideas on a concrete use case.

This intense focus on problem-solving has led to rapid growth in the German deeptech sector. Although the overall number of start-ups in Germany decreased in 2022, the number of deeptech start-ups actually grew.

Danny Rimer, a partner at Index Ventures and one of Europe’s most experienced venture capital investors, explained it this way to the German business magazine *Handelsblatt*: “Anyone who founds a start-up now only does so because they really want to build something meaningful. No one is just trying to ride a wave, as we’ve seen a lot recently.”

In addition to Wandelbots, examples of recent successful German deeptech include battery recycler Cylib, quantum computing specialist Planq and electric aircraft manufacturer Vaeridion. Technology- and start-up-oriented universities in Germany have produced a slate of promising spin-offs. The German government wants to amplify this trend.

“The German government’s start-up strategy contains measures to support deeptech start-ups even better in the future,” says Kövener.



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## "MORE AND MORE DEEPTech INVESTORS ARE TAKING NOTICE OF GERMANY."

Oliver Holle is founder and managing partner of the European venture capital fund Speedinvest. His London-based deeptech team recently identified several investment opportunities in Germany.

**In recent years you have built up a team specializing specifically in deeptech start-ups. Why?**

**OLIVER HOLLE:** We noticed that there were still conspicuously few dedicated deeptech funds in Europe, especially in Germany. At the same time, however, we see deeptech as a trending topic. That’s why we decided to build up our own deeptech expertise.

**Which areas do you find particularly interesting?**

**OH:** Deeptech can be many things from quantum technology to AI, IT security to materials research. At the moment, I find start-ups that work at the interface of biology and algorithms particularly exciting – there are very interesting new approaches emerging.

**What are the characterizing features of deeptech investments?**

**OH:** The start-ups typically emerge from universities and research institutions, so the



Photo: Speedinvest Press

founders usually have a very technical background. Not all of them are able to explain and sell their ideas well. So as an investor, you have to have a great deal of technical understanding yourself in order to understand what it’s all about and how promising these ideas are.

**What are the special features of the German deeptech scene?**

**OH:** Unlike in other countries, there are not just one or two deeptech locations here. You have to travel a lot and look around at many hubs and centers. Munich, Dresden, Aachen and Darmstadt, for example, are interesting deeptech centers. So it’s all a bit more complicated and confusing than in other countries, you have to know your way around and maintain many contacts. But the excellence in many technological areas is absolutely there. We’re convinced that we’re only at the beginning of the deeptech wave.





# THE SPONGE SOLUTION

German cities are having to adapt to hotter temperatures and to some extent less secure water supplies. Climate-resilient “sponge cities” offer one solution – and opportunities are there for international companies to soak up some good business.

**W**ater is attracting a lot of attention throughout the world, and signs of change are everywhere. For instance, the Spree River that traverses Berlin now flows backward more than 20 days a year, as water resources disappear upriver. Meanwhile, the Elbe – the river into which the Spree flows – “could be crossed on foot fairly often” last summer, as Environment Minister Steffi Lemke pointed out in a speech in June 2022.

Lemke’s words came at a research conference called “Climate-Resilient Sponge Cities”, where researchers and public officials discussed ideas for how to help urban areas preserve water and cool down as the hotter summers kick in.

The concept of the sponge city is not new. It brings together practical ideas that enhance the urban environment, such as paving stones

that allow rainwater to pass through or between them, and rooftops and façades covered with greenery. But turning cities into sponges will require an enormous and complex effort combining both public and private initiatives.

## THE BOTTOM LINE

Germany needs to adapt its cities to climate change – this means among others preserving water by turning urban environments into “sponges.” There are subsidies to support that goal and the government has launched a well-funded new initiative.

Luckily, there has been a revolution in thinking in the last few years. “The idea of sponge cities has been around for decades, but the opportunities are very good at the moment,” says GTAI’s energy, climate and smart cities expert Robert Compton. “Both the local and federal governments are ready to rethink things and convert urban areas in order to implement new ideas.”

## Greening the urban skyline

Gunter Mann, president of the German Association of Building Greening (BuGG), explains that Germany is one of the largest greening markets anywhere. “When it comes to greening roofs, we’re the biggest market,” he says. “There’s no other country that is going green to the same extent we are.”



Greening rooftops and allowing rainwater to percolate through pavements are two sponge city strategies.

“Germany has companies that have been active in this area for decades,” Mann adds. “We have the expertise and we have guidelines – we know how it works. And thanks to municipalities and support instruments, we have not only subsidies but also regulations. So if you build a warehouse here, for example, you have to compensate for it with some kind of greening. That’s a huge advantage.”

But there is still plenty of potential. “Last year, we covered nearly 9 million square meters of roof with greenery,” says Mann. “That sounds like a lot, but it’s only 10 percent of the possible roof surface that could’ve been covered.” In other words, Germany needs more companies, and especially more skilled workers, to fill the greening sector.

BuGG counts some 460 companies and municipalities among its members, around 60 of which are international companies, and for June 2023 the association has organized a three-day congress in Berlin to discuss greening buildings. “We’re inviting the whole world,” says Mann.

### A climate protection government

Germany’s coalition government, which now includes the Green Party, is doing what it can to help. The Ministry for the Environment says the sponge city has become a leitmotif for the government’s urban development program. “In urban areas, the development of integrated green space management, the unsealing of public and private surfaces, the restoration and improvement of soil cooling capacity, and façade and roof greening are particularly in demand,” a ministry spokesman tells GTAI. “In total, we are making an additional EUR 60 million available until 2026 with the immediate climate adaptation program. But this is just the beginning. This emergency program will be followed by further measures, such as a climate adaptation law and an adaptation strategy.”

This initiative is part of the German government’s new National Water Strategy, whose basic purpose is threefold: adapting infrastructure and urban development to the climate emergency, purifying water resources, and ensuring that drinking water remains of high quality and affordable for future generations.

The government plans offer a number of business opportunities for domestic and foreign players in Germany and support infrastructure is already in place. Apart from BuGG, there are several coordinating organizations like the Regenwasseragentur (Rainwater Agency) in Berlin, which has already compiled a catalog of service providers, from construction companies to engineers’ and architects’ studios, to companies specializing in roofing and landscaping.

### How the funding system works

The government will distribute the subsidies through the local city authorities responsible for urban development. Local councils are also being offered consultancy support from the federal government’s new Center for Cli-

mate Adaptation (Zentrum KlimaAnpassung). BuGG, meanwhile, provides a yearly report detailing which German municipalities provide what kind of support.

Minister Lemke has signalled that this is a government priority. “We can reinvent our cities and towns as havens of biodiversity,” she said. “As a sponge city, cities can contribute to climate adaptation and climate protection at the same time – and become more livable in the process.”

## HOW DO GERMAN MUNICIPALITIES FINANCE THEMSELVES?

Governmental power in Germany is decentralized and has many levels. There are 11,000 local governments in Germany, known as *Kommunen*, that have a constitutionally enshrined right to their own budgets. The budgets for these local authorities are meant to cover basic services such as waste disposal and sewage systems, as well as town planning.

The budgets come from a variety of sources. The municipalities collect some taxes themselves, mainly from property and trade, but they also get a certain percentage of federally collected taxes. For instance, local authorities get two cents of every euro of sales tax in Germany. Together, these tax revenues make up around 80 percent of city budgets – the rest comes from extra fees and loans.

In addition, local authorities can also apply for money from the national government to fund specific building projects. In 2015, the German government set up a special investment fund for local authorities to develop infrastructure, including urban development.



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# Recycling **RAW** Materials

International turmoil has shown the dangers of relying too much on single suppliers. That, plus the drive to protect the climate, has given industrial countries like Germany without vast stocks of raw materials all the more incentive to recycle.

**T**he majority of Germans would not be able to locate Nachterstedt, a town of 3,000 people in the eastern regional state of Saxony-Anhalt, on a map. But it is at the epicenter of the buzz surrounding the German recycling sector right now. Nachterstedt is home to the world's largest, most technologically advanced aluminum recycling center, with an annual capacity of 400,000 tons. The plant is run by the US aluminum processor Novelis, and they are expanding: investing USD 30 million in the facility.

Together with its partners along the value chain, Novelis is developing innovative, low-carbon aluminum solutions and creating recycling loops for production and end-of-life scrap. "The investment demonstrates our commitment to serve as a trusted partner for our food and packaging industry customers and create more sustainable solutions for consumers," says Emilio Braghi, executive VP

## THE BOTTOM LINE

Germany is heavily invested in the supply chain for green technologies such as batteries and has advanced recycling infrastructure for valuable metals and minerals. That means lots of potential for international companies in this area.

and president of Novelis Europe. "Increasing the use of recycled aluminum helps us reduce the use of natural resources, strengthen the circular economy and thus limit climate change."

Novelis isn't alone. In 2022, Luxembourg-based international steel company ArcelorMittal, which is pursuing a robust recycling strategy, announced the acquisition of ten scrap facilities in Germany from the Alba In-

ternational Recycling unit of the Berlin-based Alba Group. Together with the recycling specialist Interzero Circular Solutions Germany, the companies intend to work on strategies for the transition to a circular economy.

Such deals are becoming more frequent across Germany – and are likely to continue because the impetus to go circular is global. As many industries shift toward greener technologies, steel, copper, lithium, aluminum, rare earth elements (REEs), metals and minerals are in particularly high demand on the world markets. Without lithium and REEs, there would be no electric vehicle batteries. Without metals like nickel and iridium for electrolyzers, no green hydrogen. Without steel, no modern mechanical engineering. And without copper and aluminum, no hardware for digital and electronic products or even power lines. Pressure on the international raw materials markets drives up prices everywhere – and reveals the danger of national over-



# 40-55%

Share of Europe's aluminum, copper and zinc supply coming from recycling

Sources: KU Leuven, Eurometaux

## CLEAN ENERGY = CLEAN METALS

Global metal demand for clean energy technologies in the year 2050 (in megatons)

### CURRENT CLIMATE POLICIES

45 MT

### HIGH CLIMATE AMBITION

75 MT

Sources: KU Leuven, Eurometaux

## FDI PERSPECTIVE: NEOMETALS

**#turningmetalsgreen:** Battery recycler Primobius, a joint venture between plant manufacturer SMS GmbH and Australian mining group Neometals, opened a 10-tons-per-day commercial lithium-ion battery recycling plant in northwest Germany in 2022.

Primobius also signed a cooperation deal with LICULAR a wholly owned subsidiary of carmaker Mercedes-Benz, and will be the latter's tech partner in the planning and construction of a battery recycling plant in Kuppenheim, near Karlsruhe. Within the long-term R&D agreement, Primobius will recycle next-generation cell formats and chemistries. The joint venture, which is based in Hilchenbach (NRW) was preceded by around three years of research. Neometals' MD Chris Reed said: "We are proud that one of the greatest names in the auto industry has made a clear commitment toward sustainable battery recycling." Lithium battery recycling "supports conservation of resources, decarbonization and supply chain resilience, and we are excited to assist Mercedes in its goal to reuse recovered materials."

**COMPANY**  
Neometals, Australia

**INVESTMENT PROJECT**

Joint venture Primobius with German plant manufacturer SMS

**LOCATIONS IN GERMANY**

Hilchenbach, Kuppenheim

**CAPACITY**

Recycling plant with capacity of 10 tons per day

dependencies on individual suppliers. In Germany, for instance, aluminum and magnesium are largely sourced from China and Russia. To reduce these dependencies and achieve a lower carbon footprint, more metals will need to be recycled.

A study by the Belgian University of Leuven, commissioned by the European Nonferrous Metals Industry Association, concludes that "recycling is Europe's most important opportunity to strengthen its long-term self-sufficiency." By 2050, it could cover 45 to 65 percent of Europe's base metal needs and up to 77 percent for battery metals. Recycling could even provide a surplus of REEs. "Europe's clean energy system will rely on durable metals that can be preserved indefinitely in a circular economy," the report says.

"Germany has a long tradition of recycling recyclables," says Adriana Neligan, economist for environment, circular economy and sustainability at the German Economic Institute (IW). In a survey conducted by IW, three out

of five German manufacturing companies said they were working on internal recycling strategies. "Many recycling structures are already in place that companies can now build on. In this respect, Germany is further ahead than very many other countries; we are not starting from scratch, as recycling has a long tradition."

The topic is gaining additional momentum thanks to the European Green Deal and the reform of the EU's Ecodesign Directive. "Policymakers in Germany also see the circular economy as an important success factor in the shift to a climate-neutral economy," says Neligan. The German government offers incentives to support the transformation to a circular economy, such as the DigiRes program, which helps companies harness the potential of digital solutions for streamlining resource-efficient production and circular value-creation processes. The Minister for Economic Affairs and Climate Action, Robert

Habeck, has indicated that circular economy quotas and a new fund for financial aid are in the works. He's also planning to set up a fund jointly supported by the state and the private sector to provide equity, loans and guarantees to finance projects for raw material extraction, processing and recycling.



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# Lights, Camera, **BACK IN ACTION!**

The coronavirus pandemic may have temporarily shut down production in the entertainment industry, but it turned out to be a boon for visual effects and virtual production studios in Germany. It's a story that's good enough for Hollywood!

**I**n the Netflix series *1899*, passengers aboard a steamship sailing from Europe to New York encounter a second vessel seemingly abandoned in the Atlantic Ocean. The unexpected discovery unleashes a nightmare.

The supernatural, historical drama series from the creators of *Dark*, Baran bo Odar and Jantje Friese, wasn't filmed at dozens of locations or on a traditional soundstage. It was filmed entirely on a virtual stage in Potsdam – a first in Germany. Called the Dark Bay, the production facility opened on the lot of the legendary Studio Babelsberg in 2021 and is now one of the largest of its kind in Europe. Ironically, while the pandemic crippled live film production in the short term, it also accelerated the demand for streaming options and virtual production processes.

This capacity for state-of-the-art visual effects (VFX), combined with Germany's ample grants and loans for entertainment production, is making the country increasingly attractive for international production companies. "Germany offers filmmakers from all over the world excellent conditions which allow them to realize their ideas creatively using state-of-the-art technology," Claudia Roth, the government's commissioner for culture and media, said recently. "International filmmakers have been choosing Germany as the place to make their films for many years. For good reason: Our country not only offers a variety of different locations but also modern film studios with innovative and cutting-edge technology, providing impressive backdrops for all genres of films and series."

## The virtues of virtual

Rather than relying on green screens and lots of post-production, virtual production shifts the VFX work to the front of the schedule. It allows



Photo: Bernd von Jutze

»Germany offers filmmakers from all over the world excellent conditions.«

**Claudia Roth, German Commissioner for Culture and the Media**

filmmakers to segue between real and simulated worlds without any restrictions and results in more accurate scheduling, budgeting and production planning. Expensive travel budgets can be slashed when you build the worlds in 3D. Arduous post-production VFX are replaced with real-time effects that envelop the actors.

## THE BOTTOM LINE

In addition to offering substantial national and regional funding for film and TV production, Germany has a cutting-edge virtual-studio and experienced visual FX sector attracting scores of international entertainment producers.

The first show produced entirely on virtual sets, *The Mandalorian*, was released to great acclaim at the end of 2019. It was made in Los Angeles. At that point, virtual studios were already being set up in many places around Germany. After receiving funding from Brandenburg's Ministry for Economic Affairs, Labor and Energy, Dark Bay secured its future by winning a long-term booking commitment from Netflix, although the studio remains bookable for all.

Dark Bay has a massive round wall of LED lights and a modular LED ceiling, allowing filming to take place in any world the creators imagine. Its revolving stage is nearly 21 meters in diameter, allowing for scene changes of complete sets in just three minutes, and water fixtures further expand options for combining the real and the virtual. "The revolution of virtual production is in its infancy but growing quite rapidly," says Austrian producer Joe Neurauter. "It's clear that in the future audiovisual content will be made quite differently than how it is today."

Neurauter's production firm, which is based in Munich and Los Angeles, is called Occupant Films. It has produced several hits, including *Guns Akimbo* with Daniel Radcliffe. Recently, when trying to book a location for that film, the narrow production time frame didn't allow the company to use the facility they had expected.

But that gave Neurauter and Jörn Siegle, the CEO of Germany's largest film vehicle renting company, an idea. Penzing Studios – a cutting-edge facility at a former airfield about an hour from Munich – was born. It includes the Hyperbowl, Germany's first virtual production stage, established in March 2020. The Hyperbowl's virtual stage measures 20 by 14.5 meters, with a full sky and a curved horizon

*The Mandalorian* was the first series to be produced entirely on virtual sets. It was released in 2019 to critical acclaim.



**€365  
million**

Germany's total national and regional budget for film funding in 2021

Source: GTAI

### THE PROMISE OF VIRTUAL PRODUCTION

Global market size of virtual production in billion US dollars. Virtual production allows filmmakers to segue between real and simulated worlds seamlessly.

**2021**

1.6

**2030**

6.8

Source: Grand View Research

LED wall of 40 by 5.5 meters. The facility has been used by advertising and gaming clients as well as for film and TV productions.

Penzing Studios is expanding the facility with Norwegian architecture firm Snøhetta to become a creative and digital media hub for post-production, visual effects, gaming, digital media and technology companies, with an event center and accommodation. They anticipate creating more than 1,000 new jobs by 2025.

### Funding to support productions

Germany is increasing its financial support for creative media productions. The German Federal Film Fund (DFFF) and the German Motion Picture Fund (GMPF) awarded a total of EUR 147.4 million in 2021, an increase of EUR 11.9 million from 2019. That funding helped cover a remarkable EUR 740 million spent on German production costs, up EUR 35 million from 2019. Producers can also get financial support from the organi-

zations German Federal Film Board (Filmförderungsanstalt, or FFA for short) and German Film Foundation (Stiftung Deutsche Kinemathek).

The total funding available from all national and regional film incentives combined was nearly EUR 365 million in 2021. The Medienboard Berlin-Brandenburg, for example, expanded its funding for virtual film productions in 2022-2023 to EUR 9 million.



## FDI PERSPECTIVE: CINESITE

In 2018, London-based VFX firm Cinesite acquired Munich-based Trixter, whose notable work includes *Spider-Man: Homecoming*, *Ant-Man*, *Captain America: Civil War* and *Iron Man 2*.

"The Trixter team has a fantastic reputation for producing high-quality concept art, character design alongside complex VFX and feature animation. In partnering with Trixter, we are executing our strategic objective of enhancing our market position in both visual effects and animation and getting the benefit of an amazing creative team of people in Munich and Berlin," says Cinesite CEO Antony Hunt. "The skills transfer, technology collaboration, shared resources and approaches across our international studios bring benefits to all our teams and the quality of the work they create." Since then, Cinesite has taken a stake in additional global VFX firms and animation studios, expanding its global reach even further.



one. As virtual production is so new, there are very few global teams that have established end-to-end workflows. "Some big project leaders try to keep that info proprietary to stay competitive, but we need different disciplines to collaborate," Neurauter says. "People are coming up with new iterations and figuring it out. There is a new crop of filmmakers and talented crew entering the space."

That collaboration is paying off – a USD 70-million remake of *The Crow*, directed by Rupert Sanders and filmed in part virtually at Penzing Studios, is the biggest international production ever filmed in Bavaria. "Many producers and financiers think Germany is too expensive compared to eastern Europe, but they should all take a serious second look," Neurauter says. "For the right project, there are real advantages to Germany."

### Foreign investment flowing in

A number of German production studios have also been acquired by foreign corporations in the past few years. London-based VFX firm Cinesite acquired Trixter in 2018. The Munich-based post-production company has collaborated with Marvel Studios to bring memorable characters to life, including *Iron Man*, *Black Panther*, *Rocket* and *Baby Groot*.

And US streaming giant Netflix has made large investments in German production. When Chairman Reed Hastings attended the opening of Netflix's Berlin office in September 2021, he pledged that the company would spend EUR 500 million on TV shows and movies produced in Germany, Austria and Switzerland over the next three years.

In late 2021, Netflix announced it was acquiring Scanline VFX for an undisclosed amount. The firm, founded in Munich in 1989,

»The revolution of virtual production is in its infancy but growing quite rapidly.«

*Austrian producer Joe Neurauter*

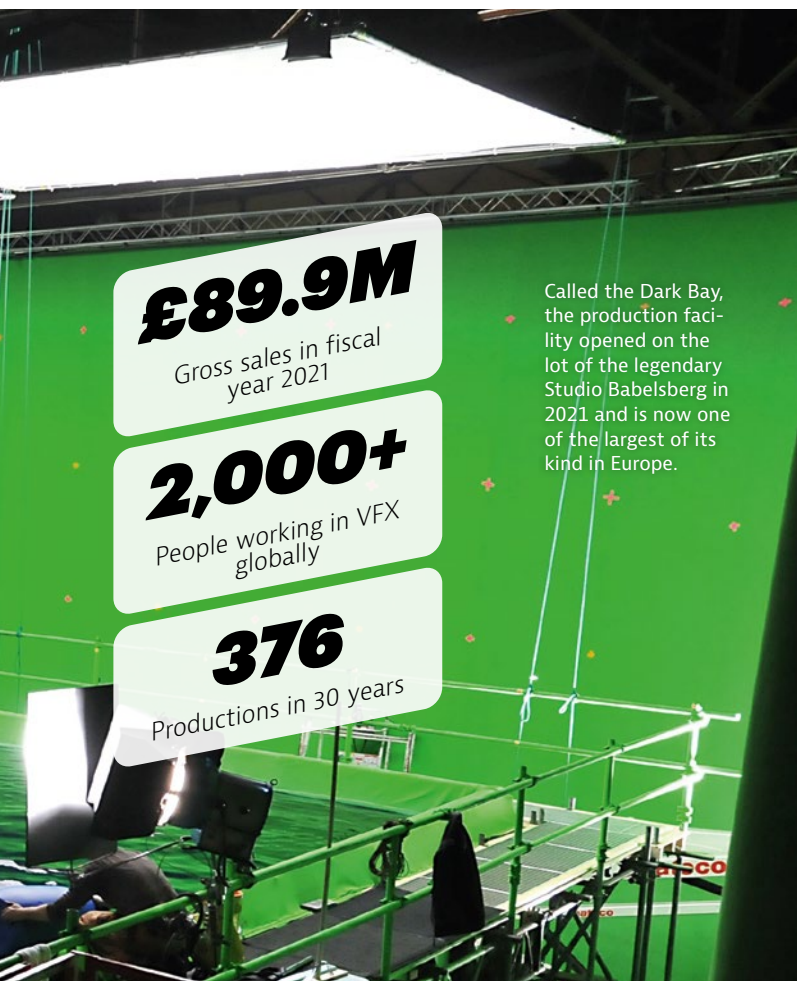
has worked on a number of Netflix projects, including *Stranger Things*, *Slumberland* and *Cowboy Bebop*, as well as award-winning projects *Game of Thrones* and *The Suicide Squad*.

But while it's an exciting time for the entertainment industry, it's also a challenging



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**£89.9M**

Gross sales in fiscal year 2021

**2,000+**

People working in VFX globally

**376**

Productions in 30 years

Called the Dark Bay, the production facility opened on the lot of the legendary Studio Babelsberg in 2021 and is now one of the largest of its kind in Europe.



The German actress Emilia Schüle in Traumfabrik, which was produced in Babelsberg.

Photo: Studio Babelsberg/ARRI Media Productions/Pantaleon Films/TOBIS Filmproduktion/herbX

## FINANCIAL SUPPORT FOR THE GERMAN FILM INDUSTRY

Total sum of financial support for the film industry in 2019 and 2021 by the German Federal Film Fund (DFFF) and the German Motion Picture Fund (GMPF) in million US dollars

**2019**

**135.5**

**2021**

**147.7**

Source: German Commissioner for Culture and the Media

## GERMAN STREAMING MARKET REVENUE FLOWS

The coronavirus pandemic led to a dramatic expansion

	2018	2019	2020	2021
Turnover with streamed movies	1,201	1,577	2,044	2,485

Source: Grand View Research

## FUNDING FOR FILM AND TV PRODUCTIONS IN GERMANY

Subsidies and tax credits from both national and regional sources in Germany can be combined to have the maximum effect on a production's budget.

### DFFF II

This grant offers funding for VFX and production services carried out in Germany. Films spending at least EUR 8 million in Germany out of a total budget of at least EUR 20 million can claim 25 percent of the German spend, up to EUR 25 million per project.

### GMPF

Europe uses 9 percent of all microchips produced worldwide, and 37 producers of films, high-end TV and video-on-demand (VoD) series in Germany can apply for a grant of up to EUR 10 million from the German Motion Picture Fund, based on local production costs.

### FFF in Bavaria

International productions with a German coproducer may qualify for a conditionally repayable loan for 30 percent of film and series production costs, up to EUR 2 million in total.

### MBB in Berlin-Brandenburg

Film, TV and media productions in Berlin and Brandenburg may qualify for a conditionally repayable loan of up to 50 percent of total production costs, up to EUR 1 million.



K&P Hendlhof uses ethical and sustainable breeding methods for its poultry.

# EVOLVING GERMANY'S AGRICULTURE

Photo: picture alliance/Jeff Mangione / KURIER/picturedesk.com

Germany is shifting to a more sustainable agricultural model – the coalition government plans to triple the country's organic farmland by 2030. That means fertile ground for international solutions providers, machinery manufacturers and biofertilizer and feed producers.

## STRONG SUSTAINABLE AGRICULTURE TRENDS IN GERMANY

### 1

#### Organic farming

From year to year, the proportion of agricultural land in Germany used for organic farming is increasing. In 2021, around 11 percent of cultivated land was farmed organically. The government's target is 30 percent by 2030.

### 2

#### Animal husbandry

Demand for organic meat in Germany now exceeds domestic supply. In 2021, sales of organic beef and pork increased by 20 percent, and organic poultry by 10 percent. The only limit on market growth is supply.

### 3

#### Organic food

In 2021, the market for organically produced food in Germany grew by 5.8 percent. That year, Germans also spent a total of almost EUR 16 billion on organic food and beverages.

### 4

#### Meat alternatives

In 2021, companies in Germany produced 98,000 metric tons of meat substitutes worth EUR 458 million. Compared to the previous year, production therefore increased by 17 percent.

# 4

**G**erman Agriculture Minister Cem Özdemir thinks the time is ripe for change. “We are united in the German government,” says Özdemir, a Green Party veteran who is now part of a coalition government with the center-left Social Democrats and business-friendly Free Democrats. “We want to transform our agricultural and food system sustainably with ‘organic’ as our guiding principle for sustainable agriculture. More organic farming is needed now, not less.”

Right now, only about 11 percent of German farmlands is devoted to organics. The aim is to increase that figure to some 30 percent by 2030. The government also wants to promote sustainable livestock husbandry. From now on, pork labeling will have to provide transparency about the way the animals are kept, for example. In addition, CO2 emissions from livestock farming – which account for around half of all agricultural emissions – are to be significantly reduced.

Germany may be known foremost as an industrial nation, but half of its land area (some 17 million hectares) is used for agriculture. The reforms therefore entail nothing less than a rapid overhaul of the country’s entire – and very lucrative – agricultural system.

### Fantastic growth potential

This top-down drive toward sustainable agriculture opens up new business opportunities for companies from various sectors. For example, growth opportunities are also opening up in Germany for manufacturers specializing in biofertilizers and for producers of ecological animal feed.

Or take the agricultural equipment sector: When the use of chemical fertilizers and weed killers is restricted, farmers will need new machinery to fulfill those functions.

To support food producers in this transition, the Landwirtschaftliche Rentenbank, Germany’s development agency for agribusiness and rural areas, has launched a four-year program offering subsidies of up to 40 percent of costs for businesses investing in organic farming.



*»In the coming years, the proportion of organically raised animals in Germany will increase, and with that, the demand for organic feed will also increase.«*

**hanna Treu of the German organic food industry federation BOLW**

Companies in the agricultural equipment manufacturing sector, such as Sweden’s Lyckeå Group, which specializes in organic and sustainable technical solutions that reduce the need for herbicides and pesticides, see this as a great growth opportunity. “The demand for sustainably produced food is increasing throughout Europe,” the firm says. “Our products will play an increasingly important role for farmers who want to decrease their use of chemicals.”

### THE BOTTOM LINE

**Government directives and changing consumer tastes are driving demand for organic farming and animal husbandry in Germany. Manufacturers of farm equipment and feed can profit.**

### Macrobiotic feeding frenzy

Strong growth is also predicted for organic feed. “In the coming years, the proportion of organically raised animals in Germany will increase,” says Hanna Treu of the German organic food industry federation BOLW. “And with that, the demand for organic feed will also increase.” Already, the demand for these kinds of products in Germany is greater than the amount produced domestically, and farmers rely on imports. “If organic farming triples, there is enormous potential here for feed producers within the organic circular economy,” says Treu.

Growth expectations for the sector are fueled not only by government targets but also by the changing preferences of German consumers. Demand for organic food in Germany has for a long time exceeded the country’s capacity to supply. And more and more German consumers are looking for organic labels when shopping for food.

With sales of around EUR 16 billion in 2021, Germany is Europe’s largest organic food market. 2021, demand for organic meat alone rose by almost 20 percent. Overall, the organic food sector recorded an increase in sales of EUR 880 million in 2021. The organic share of the total food market rose to around 7 percent. Furthermore, the sector is more profitable than it used to be: On average, organic farmers achieved around 9 percent higher revenues in 2021 than in the previous year.

“For several years now, people in Germany have been placing increasing value on healthy as well as ecologically and animal-friendly food,” says Daniel Lindel, GTAI industry expert for the food industry. “This is a trend that is set to grow.”

To meet rising demand and achieve government goals, Lindel expects the pace of change in agriculture to accelerate in the coming years. “That opens up a lot of opportunities for innovative companies.”



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# NEW DIMENSION in Medical Technology

Germany is Europe's leading medical technology market. It's also home to 24 percent of the world's additive manufacturing companies. Increasingly, those two fields are coming together, which bodes well for international suppliers.

**E**very year in Germany alone, for a variety of medical reasons, some 60,000 people have to undergo amputations. Around the world, there's a vast demand for prosthetics, which are critical for rehabilitation and patients' ability to get on with their lives. And a need exists as well for innovative solutions to produce artificial limbs.

Additive manufacturing is radically changing the production of medical hardware gener-

## THE BOTTOM LINE

Additive medtech manufacturing is a growing trend that combines two traditional German strengths. International molding and medical instrument companies have expanded into Germany with great success – but there's room for more.

ally. The greater flexibility of design and adaptability it offers have made bespoke treatments based on patient-specific data a reality. After all, if prosthetics are to increase a person's quality of life, it's better if they're custom fit.

One company involved in the convergence of medtech and additive manufacturing is the American firm Formlabs. Its Selective Laser Sintering (SLS) printer, called Fuse 1, makes 3D medical printing simpler and more afford-

Precision additive manufacturing is the state of the art in dentistry



able. And it's found a solid base in Germany. "Our headquarters are in Boston, but our EMEA location in Berlin has been growing rapidly since 2015 – thanks to the high availability of young international talent here as well as the excellent start-up ecosystem and the distinctive 3D printing community," says Stefan Holländer, Formlabs' managing director for EMEA.

In 2017, GE Additive, part of the US multinational General Electric, opened its new Customer Experience Center in Munich to showcase its 3D printing operations. "Germany is a pioneer for the entire additive manufacturing movement, so it was no coincidence we chose Munich to open our first center," said GE Additive's Robert Griggs at the time.

GE Additives' subsidiaries include the Munich-based 3D metal printer manufacturer Concept Laser, which develops machines for use in the medical and dental industries. Formlabs and GE Additives are two members of an incredibly agile business sector.

#### **Collaborations galore**

Germany's medical hardware printing sector has been attracting major foreign business investment from the US, Japan and China recently. In 2022, America's 3D Systems acquired Munich-based Kumovis, which specializes in personalized healthcare applications. Its unique technology was specially developed for the precision printing of medical-grade, high-performance polymers used for human implants and surgical instruments.

The Lübeck-based SME SLM Solutions, a global provider of metal additive manufacturing solutions for a wide range of industries, including healthcare, recently agreed to become part of Japan's Nikon Group.

Chinese molding equipment manufacturer Yizumi is also eyeing Aachen (which it describes as a global "heartland of plastic machinery technology") as a location for one of its main overseas sites. Established in 2017, Yizumi's German subsidiary was set up to focus on R&D and advance cooperation with research institutions for the whole group, and is described by its chief strategy officer, Hans Wobbe, as an "innovation engine."

### **PROJECTED 2023 REVENUE FOR ADDITIVE MANUFACTURING**

**Global:  
€21.5  
billion**

**Germany:  
€2.4  
billion**

**24%**

Share of all additive manufacturing companies worldwide that have headquarters in Germany

Source: Bitkom Research 2021/GTAI

#### **Why Germany?**

Germany's extra-university research network has made the country a particularly attractive location. The Fraunhofer Society's additive manufacturing activities alone span 19 institutes across Germany, covering the entire process chain. GE Additive recently joined EOS as well as Audi and Siemens in planning the Bavarian Additive Manufacturing Cluster (BAMC), which aims to further support the industrial proliferation of 3D printing.

In Bavaria, the regional government is planning to invest up to EUR 500 million to transform the Max Planck Society's Martinsried Campus into a leading international research hub for taking 3D printing to new levels. Bio-medical researchers at the campus are working on the development of new technologies, including 3D printing biological components, molecular design, robotics and artificial intelligence.

Meanwhile, Berlin's economic development agency has set up an innovation platform called Additive Manufacturing Berlin Brandenburg (AMBER) to support the sector in the region.

"Germany is the ideal transformation platform for 3D printing: from research and dual training to highly specialized and globally unique product and production skills," says Professor Claus Emmelmann, advisory board member of the industry association Verband 3DDruck and head of the iLAS Institute of Laser and System Technologies at the Hamburg University of Technology. "After the manufacture of prototypes and small series with plastics was established, a technological leadership for metallic 3D printing has developed in the last decade."

These applications include pioneering 3D printing in medical technology, such as endoprosthesis and dental products, Emmelmann adds.



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Michael Kern is the managing director of the Norsk-Tysk Handelskammer, the Norwegian-German Chamber of Commerce. He studied economics at the University of Kiel and is fluent in multiple languages. Prior to his current post, he worked for German Chambers of Commerce in Poland, Slovakia and the Czech Republic.

Photo: AHK/Norwegen

## »NORWAY IS KEY TO SUPPLYING GERMANY WITH ENERGY.«

With Russian supplies politically off the table, Germany is turning to Norway for more natural gas imports. Michael Kern, the managing director of the Norwegian-German Chamber of Commerce, describes how economic relations between the two countries are developing.

### What is the current situation with Norwegian gas imports to Germany – i.e. in the last quarter of 2022?

**MICHAEL KERN:** Norway has in fact already increased gas deliveries to Germany. Even in 2021, 43 percent of Norway's total gas exports went to the country, and if production and delivery capacities are increased in favor of gas over oil, it could provide even more. In August 2022, Germany covered 38 percent of its gas needs with Norwegian imports.

### How do Norwegians view Germany? How does Germany Trade & Invest support its image in this respect?

**MK:** Germany has a good reputation in Norway as a competitive, efficient country with a stable economy. Germany is a major partner of Norway in terms of exports and industry. Norway recently presented its plan for a transition to green industry, emphasizing enhanced economic activities in areas like hydrogen, offshore energy, CCS, battery production and maritime technologies. There's lots of crossover with Germany and the German economy. In order to scale up these areas, Norway needs strong economic partners in Europe. With its overviews of markets and reports on business expansion possibilities, Germany Trade & Invest (GTAI) plays an important role here.

### What sectors in Germany are most interesting from a Norwegian perspective? Is GTAI's industry expertise helpful?

**MK:** Machinery and equipment remain very important and represent the largest segment of Norwegian imports from Germany. Chemicals are also very significant. Renewable energy, digitalization, and e-health are all sectors worth investing in for the future. GTAI supports knowledge gathering, and Norwegian companies have praised the help they've received.

### What makes Germany a particularly attractive business location for Norwegian companies?

**MK:** Germany is one of the world's largest markets. It's very productive and has a lot of innovation. That makes Germany very interesting for Norwegian companies. In addition, Germany is a very important political partner for Norway in Europe. For many years, Norway has had a "Germany strategy," which it constantly updates. It's intended to further deepen the economic, political and cultural exchange between the two countries at all levels.

### What sorts of Norwegian companies are thinking about expanding to Germany at the present time?

**MK:** Without doubt those in the renewable energy sector. The Norwegian company Statkraft is Europe's largest producer of renewable energy at the moment. The German market is managed from Düsseldorf. For example, it supplies the German rail company Deutsche Bahn with green power. Norway is also a pioneer in e-mobility, and the country has a well-developed charging infrastructure. There have also been business expansions into Germany in this sector, for instance the charging infrastructure provider Mer and the fast-growing Norwegian telecommunications firm BraCom. The digitalized electricity provider Tibber has also made the move to Germany.

### CONTACT



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# How Germany Works

## SHAPE-SHIFTING MINISTRIES

In Germany, the names and areas of responsibility of government ministries aren't set in stone as they are in many other nations. The Ministry for Economic Affairs and Climate Action (BMWK) is the perfect example. It began life as the Ministry for Economics when the Federal Republic of Germany was formed in 1949. It's also

been known as the Ministry for Economics and Technology, the Ministry for Economics and Labor, and the Ministry for Economics and Energy. It was also once half of a super-ministry for 18 months – the Ministry for Economics and Finance. This fluidity reflects the horse-trading that goes on between political parties since,

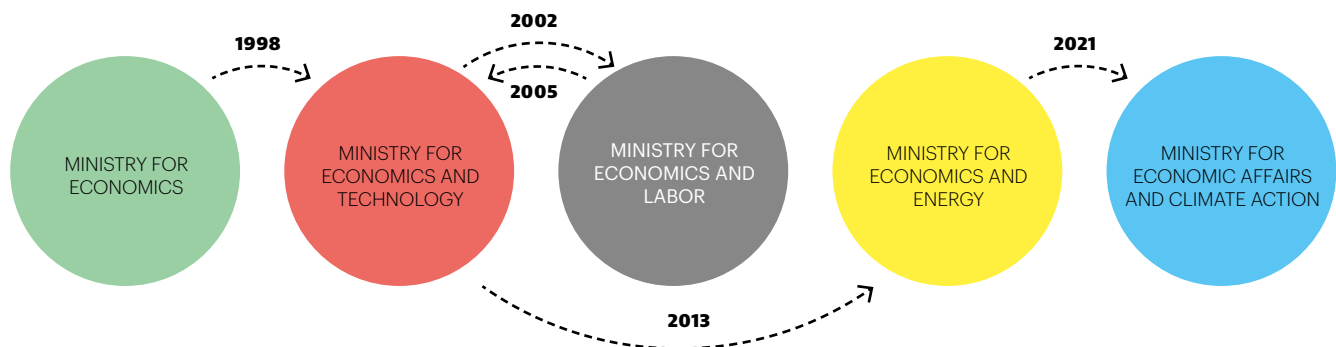
as a rule, German governments need to enter into coalitions in order to achieve the parliamentary majorities. The many name changes also manifest shifts in political outlooks. The current combination of economics with climate protection expresses the priorities of Minister Robert Habeck from the Green Party. In fact,

it's the first time a Green has held this office.

There are fifteen ministries in total plus the Chancellor's Office, which has the status of a ministry. Along with the chancellor himself, they form what Germans call "the government," distinguishing it from the parliament and other state bodies.

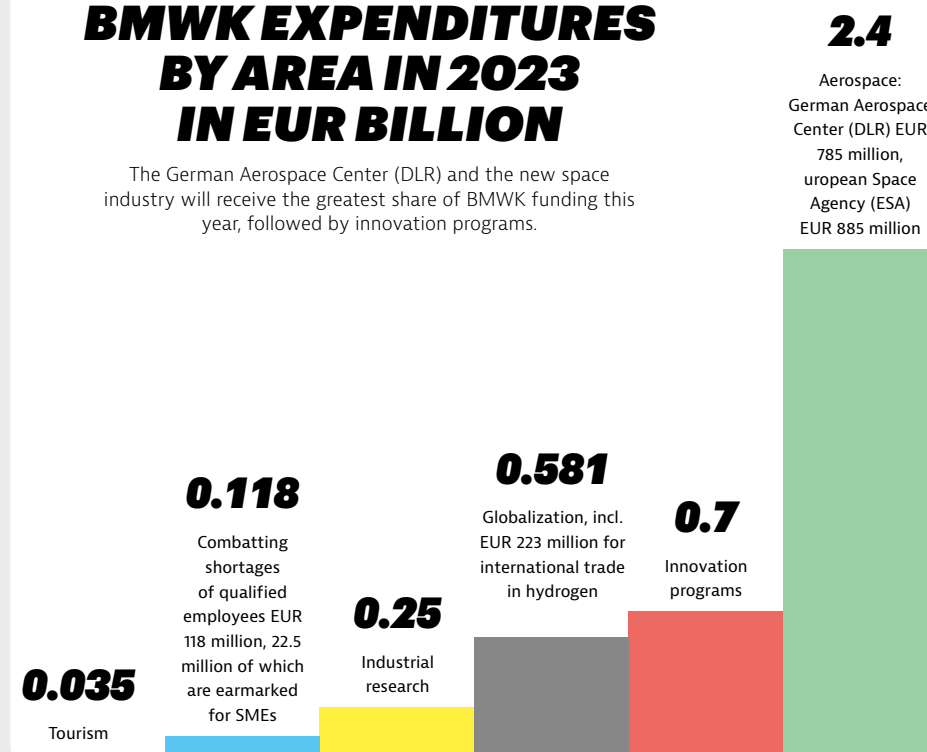
### MINISTRY IN TRANSITION

Over the past 25 years, the ministry has evolved to encompass labor, energy and climate action.



### BMWK EXPENDITURES BY AREA IN 2023 IN EUR BILLION

The German Aerospace Center (DLR) and the new space industry will receive the greatest share of BMWK funding this year, followed by innovation programs.



#### The Ministry in Numbers (2023)

**13.05**  
EUR billion  
BMWK budget

**685.5**  
EUR million  
Predicted  
income earned

**6.2**  
EUR billion  
Subsidy  
expenditures

**5.3**  
EUR billion  
Investment  
expenditures

**950**  
EUR million  
Personnel  
expenditures

#### Need to Know

Scharnhorststraße 34-37, 10115 Berlin, [www.bmwk.de](http://www.bmwk.de)  
Number of employees: 2,187 (1,633 are permanent civil servants; more than half, 1,149, are women)  
Six subordinate offices: Federal Cartel Office (BKartA), Federal Office for Economic Affairs and Export Control (BAFA), Federal Network Agency (BNetzA), Federal Institute for Materials Research and Testing (BAM), German National Metrology Institute (PTB), Federal Institute for Geosciences and Natural Resources (BGR)



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### Get in touch with our Investor Support Service Team



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