GTAI GERMANY TRADE & INVEST

MARKETS

GERMANY

3/18

AI'S TIME HAS COME

From healthcare to production, logistics to sales and marketing, there are few sectors that will not be transformed by artificial intelligence (AI). We survey Germany's thriving and upcoming AI clusters.

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Old to gold: a Berlin startup is now Europe's biggest used car dealer

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Why eastern Germany is attracting international film productions

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German engineers and entrepreneurs are pioneering the artifical intelligence applications of the future.

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ENTERTAINMENT

Lights, Camera, und Bitte!

Berlin-Brandenburg and Görlitz are international hotspots for film production, attracting big talent and funding.

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Foot off the Brake!

From automobility to aerospace, 3D printing is being adopted across industry as it enters a period of super-charged growth.

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The Spirit of Bauhaus

Product design still plays a big role in Germany's exporting success. Industrial design expert Uwe Gellert explains why.

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Online at:
www.marketsgermany.com

TECHNOLOGY

A Tale of Two Smart Cities

From transportation and energy to waste and lifestyle efficiencies, Germany's Smart Cities are ushering in a new era.

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Photo: Illing & Vossbeck Fotografie

»Not only is Germany a highly attractive market for AI; it is also a world leader in research and development.«

Dear Reader,

Global accountancy firm PwC estimates that the consistent use of artificial intelligence (AI) could boost the global economy by €13.4tn – a truly auspicious sum. AI is forecast to increase Germany's gross domestic product by 11.3 percent over the same period. This reflects the country's position as a highly attractive market for AI and a world leader in research and development in this field. These are two good reasons to invest in Germany: we explain how, where, and why in the "Focus" pages of the current issue of *Markets Germany*.

Have you ever heard of *Görliwood?* Maybe not, but you know probably Wes Anderson's movie *The Grand Budapest Hotel,* which was shot in Görlitz in Saxony. Görlitz – known as *Görliwood* in the film industry – is one of the favourite locations for European and Hollywood film productions in Germany's eastern federal states, alongside Berlin and the legendary studios in Potsdam-Babelsberg. In the article "Lights, Camera, *und Bitte!*" we look at what makes the region a true Eldorado for filmmakers.

What do the cities of Munich, with 1.5m inhabitants and home to the headquarters of BMW and Siemens, and Bottrop, with 117,000 inhabitants, have in common, apart from the fact that both cities are in Germany? They are both laboratories for the development of an emerging phenomenon known as the "Smart City." Around the world, more and more people are making cities their home, and in Germany, solutions are being developed to optimize urban living, which will benefit both people and the environment. Find out more in the article "A Tale of Two Smart Cities."

Dr. Robert Hermann, *CEO*
Email: invest@gtai.com

ONE TO WATCH

Photo: Feinkorn-Gaby Gerster

Lauri Karp, co-founder and CEO of emformX

Perhaps Lauri Karp was destined to be in banking – at least he was born in a building in Estonia that is now part of a bank. The former financial consultant and co-founder of Frankfurt-based emformX helps European financial services institutions to communicate with and serve their customers more efficiently and effectively. The venture draws on Karp's extensive 20-year experience in finance. After studying economics in Heidelberg, he moved to Frankfurt in 1998 to work for one of the major players in banking. "It was an exciting phase which saw the first wave of digitalization: there were lots of new ecommerce products and a boom on exchanges. It was a catalyst for what was possible," he says.

He was a freelance consultant from 2001 to 2008 before deciding to set up the software company TreasuryView with his twin brother Margo. They had just begun coding, when the global meltdown happened. "These were really tough years, because the product was about interest rate and debt management aimed at customers in banks and the public sector. Suddenly customers disappeared, so our market shrank rapidly. Meanwhile, the Interest rate had shrunk to 0% – so who needs a risk solution?" Luckily, their public sector clients stuck with them and they emerged stronger.

Benefiting from Karp's past experiences and professional network, the new venture emformX is seizing the opportunities in the financial services industry arising from the fast-moving forces of digitalization and cloud services. EmformX offers an application programming interface (API) product and provides a platform that helps to simplify otherwise time-consuming financial and transaction data analysis: "We make dumb data smart," he says, "and deliver automated content to our customers that makes sense."

Karp is more convinced than ever that Germany – and Frankfurt in particular – offers the right base for innovation and growth: "It has the best business environment and legal infrastructure to support a business looking to see what is possible."

www.emformx.com

Surgeon console
The surgeon operates the Da Vinci system: their manual movements are translated seamlessly into robotic surgical operations in real time.

Vision system
Equipped with a high-def 3D endoscope and image-processing equipment that provides true-to-life anatomical images.

Patient-side cart
Positioned where the patient is during surgery, the machine has up to four robotic arms to carry out the surgeon's precise commands.

Photo: Intuitive Surgical, Inc.

Endowrist instruments Each has seven degrees of motion and is designed for a specific task e.g. clamping, dissecting, suturing.

AI's Time Has Come

Artificial intelligence (AI) will fundamentally change the nature of industry. German companies, researchers and developers are pioneering the disruptive AI applications of the future. Little wonder foreign investment is flowing into German R&D.

Ada learns fast. She has to. That's because Ada is a frontline health worker who consults with people who are in pain and feeling unwell. To do her best for her patients, Ada needs to know all the relevant medical basics. She must ask the right questions and analyze in minutes whether the symptoms suggest a serious illness, if she should bring in a doctor; or alternatively, if a few soothing words, a day in bed, or a trip to the pharmacy are enough to treat her patient.

Ada does not have a medical qualification or even a university degree. Everything she knows she learned in a Berlin backyard from entrepreneur Daniel Nathrath and his team. Ada's creators have programmed her to be a health consultant and trained her with the combined knowledge of more than 70 physicians, mathematicians, data scientists and computer scientists. By now you may have realized that Ada is not human but an Artificial Intelligence (AI).

When users of the Ada app enter their symptoms into the chat program, "she" collects and maps the collective medical knowledge of western medicine and applies it through an algorithm. "We've spent seven years working intensively on AI data processing and building a global network of medical experts to support us," says Nathrath, CEO and founder of Ada Health. "This gives us a real head-start here in Berlin and makes us the world's leading software for diagnostic support." Over three million people are already using the Ada app worldwide and last year €40m of capital was ploughed into the startup to develop the service further. Investors included prominent

international financiers such as U.S. billionaire Leonard Blavatnik, Google business chief Philipp Schindler, and British AI professor William Tunstall-Pedoe, who developed the technology behind Amazon's voice-driven artificial intelligence "Alexa."

KI: "Made in Germany"

Ada is just one of many examples of innovative startups under the *Künstliche Intelligenz* (KI) "Made in Germany" banner, whose pioneers of future tech are revolutionizing whole sectors and attracting investment from all over the world. Supporting the new generation are research institutes like the German Research Center for Artificial Intelligence (DFKI), where scientists and companies have been working together since the 1980s to teach machines how to think. With more than 900 employees, DFKI is the world's largest research center in this field. It has spawned more than 80 spin-off companies and has big league partners and shareholders such as Airbus, Nvidia, Intel, Google, Microsoft and Ricoh.

Upcoming AI clusters

Germany's younger research clusters such as Cyber Valley in southern Germany are also gaining influence and considerable momentum. Founded just two years ago by the Max Planck Institute for Intelligent Systems (MPII) together with auto groups Bosch, Daimler, BMW and Porsche, the cluster has just secured €1.25m investment from Amazon for a research cooperation. The U.S. giant has also established its own AI research center in Tübingen. "Research into artificial intelligence in Germany clearly focuses on the question: how can AI make internationally successful German industries, services and products even better?" explains the managing director of GTAI Robert Hermann.

Wolfgang Wahlster
»Germany has produced many pioneers.«

It is thanks to innovators like Wolfgang Wahlster, head of the German Research Center for Artificial Intelligence DFKI, that Germany has been pioneering artificial intelligence since the 1980s. He tells *Markets Germany* about the strengths of Germany as a business location.

Mr Wahlster, how long have you been involved with artificial intelligence?

Since the early 1980s when I did some basic research into AI for my dissertation on how to teach a computer to understand natural language. At that time, I was a lone warrior in the field in this country. The DFKI was founded in 1988 together with the Federal Ministry of Education and Research and our industry partners. It is now the largest AI research center in the world.

How important is Germany as a location for AI research?

We have produced pioneers in many areas. For example, in the analysis of image sequences and in autonomous driving. The first autonomous car did not drive in Silicon Valley, as some people mistakenly think, but in Munich 15 years ago. At that time the Federal Armed Forces College developed a Mercedes van and sent it down the Autobahn at a speed of 100 kilometers per hour.

Is the Federal Republic still competitive today?

Artificial intelligence is now found in numerous industries. Automobile companies such as BMW and the world's largest suppliers Bosch and Continental have their own AI laboratories. The laser scanner manufacturer Sick is also a beacon in this field: almost every AI laboratory worldwide uses their sensors. German companies are very good at linking physical products to the Internet, and we have a big head start in the smart home market.

Does this lead to foreign companies investing in German tech?

Of course. For example, the agricultural machinery manufacturer John Deere has built an R&D center next to the DFKI. This was no coincidence: the region is home to many important companies.

This focus on AI applications is one of the key strengths of German research and development (R&D). "With regard to AI, the boundary between basic research, application-oriented research and transfer to industry is fluid," says Hermann. The development of machine learning technology is progressing so fast that there may only be a few months between the idea stage and a first application. "Many AI applications have what it takes to make a profound change to entire industries and branches once they pass the field test," he adds.

A study by the consulting firm PwC concludes that the growth potential for the global economy through innovative products that use AI, combined with gains in efficiency, could reach €13.4tn by 2030. In Germany alone, GDP will rise by 11.3 percent over the same period thanks to developments in intelligent technology. The study identifies a large proportion of industries within Germany (healthcare, energy and the auto industry in particular) that will benefit from significant productivity gains by adopting AI applications.

Unsurprisingly, there has been a surge in interest in joint research projects from the corporate sector and foreign investors. From machine tool manufacturers to medtech application developers, makers of household appliances through to energy suppliers, companies are queuing up to find out how their products and services could be improved with AI. "There are also many exciting German AI projects in the field of *Industrie 4.0*," says Hermann. In factories, for example, intelligent machines can now evaluate the data from thousands of sensors to optimize production and improve product quality. Meanwhile, businesses and scientists are testing the use of collaborative AI robots and linking augmented reality technology to AI-based production planning systems.

16th ASIA-PACIFIC CONFERENCE of German Business
01 - 03 NOVEMBER JAKARTA 2018

Asia-Pacific Conference of German Business (APK)

The conference is **the** flagship event for top business leaders, executives and government representatives to discuss and promote economic relations between Asia and Germany. This year's APK will dive into the latest developments in mobility, urbanization and artificial intelligence (AI). GTAI is once again a partner organization and will host – together with DIHK – a panel of experts to discuss the "hype vs. reality" of AI as well as promising applications.
→ ***www.apk2018.com***

A number of trending tech topics come together in the German automotive industry. Global groups such as Volkswagen, BMW and Daimler are investing heavily in modern, AI-controlled factories. At the same time, manufacturers are working on solutions for assisted and autonomous driving, intelligent operating systems, entertainment systems and navigation systems at their German R&D centers. The auto companies are open to collaboration on joint development projects with foreign partners and investors. One of China's largest virtual reality companies, 51VR, is planning to invest in an R&D facility in Frankfurt, for example. 51VR uses software developed for the gaming industry to create elaborate virtual realities that are hardly distinguishable from the real world. It now wants to combine these virtual worlds with artificial intelligence – hence their interest and investment in projects in Germany.

VR used to train intelligent machines

51VR's core concept is that intelligent machines can test their skills and train in virtual reality environments. Just as human beings acquire skills by interacting with the real world, AI machines will be able to practice decision making and action patterning in a complex VR environment that mimics the real world. This could have benefits for German car manufacturers, who could train intelligent navigation and control systems for their vehicles in the virtual traffic of a 51VR pro-

→

FACTS & FIGURES

AI – the trillion dollar technology

€13.4tn

Potential contribution to the global economy by 2030 from AI (More than the current GDP of China and India combined) [1]

€430bn

Potential growth of the German economy by 2030 resulting from adoption of AI technology, applications and services across all sectors.

AI: the new engine of value

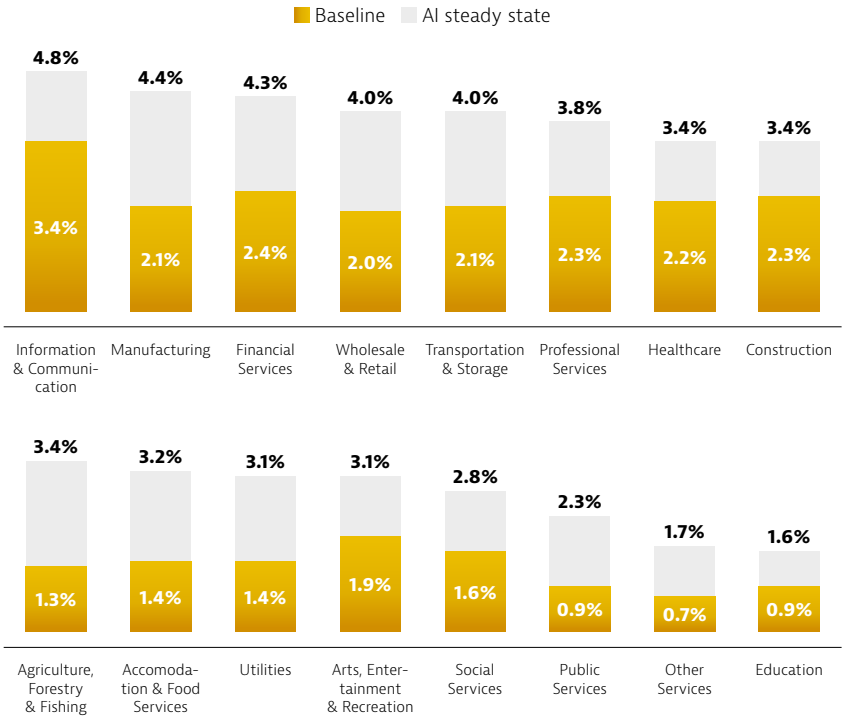
The worldwide automotive industry could increase its value by €184bn by 2025 due to the cost savings and boost in revenue that AI promises.

€ = Added revenue potential and cost savings due to AI [2]

Production	Procurement	Intralogistics & supply chain management	Sales and marketing
€52bn	**€43.5bn**	**€18.8bn**	**€26.5bn**

Growth accelerator AI

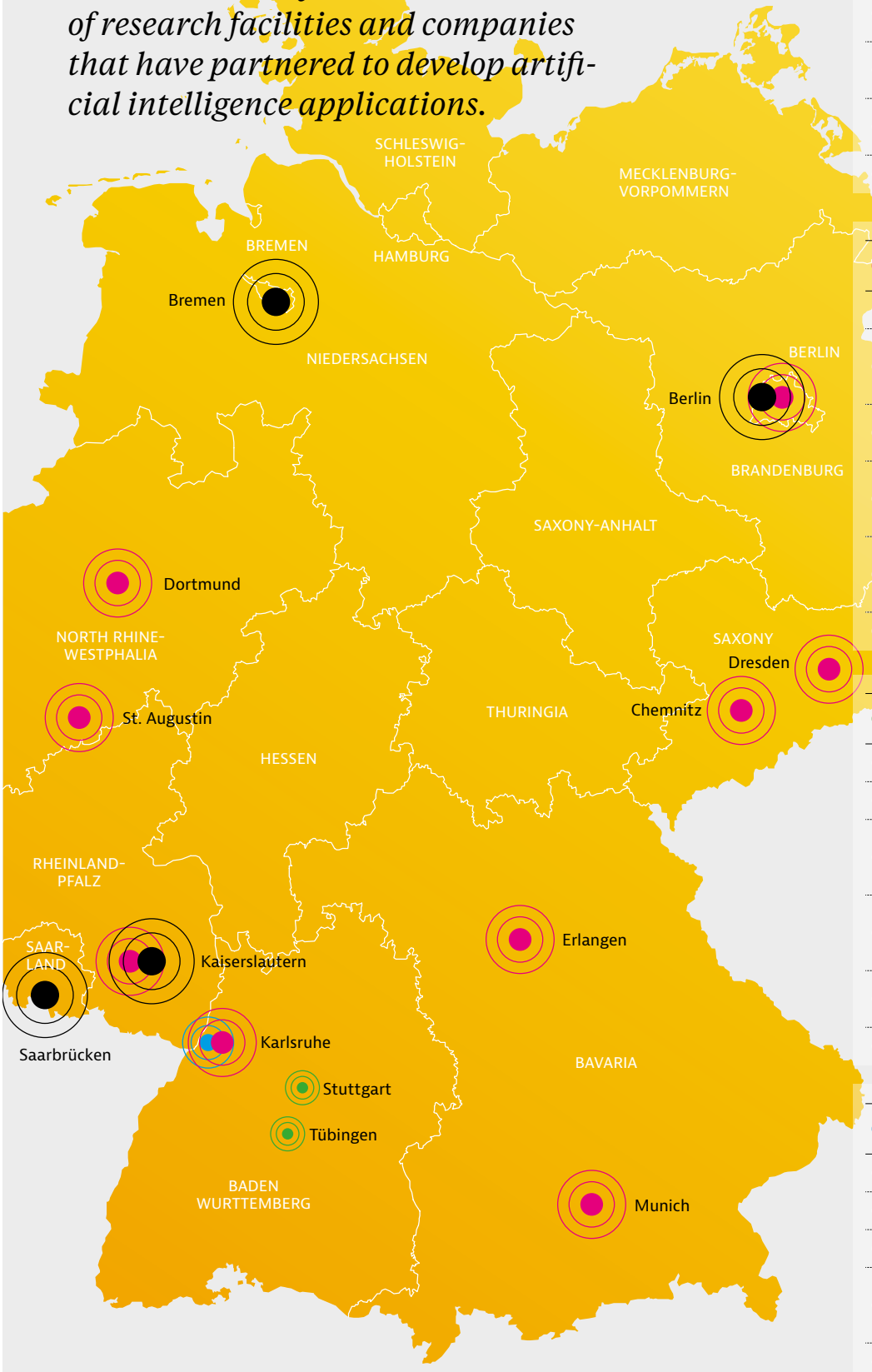
AI's impact on economic growth rates across different industries by 2035 [3]



1) Source: PwC study "Sizing the price of AI" 2018; 2) Source: McKinsey 2018, Accenture 2017; 3) Industry growth with/without using AI technology, Source: Accenture 2017

Leading AI clusters in Germany

All over Germany there are hundreds of research facilities and companies that have partnered to develop artificial intelligence applications.



German Research Center for Artificial Intelligence (DFKI)

- Founded 1988
- Kaiserslautern, Saarbrücken, Bremen, Berlin
- 200+, including SAP, Harting, Google, Microsoft, Volkswagen
- University of Bremen, Technical University of Kaiserslautern
- Internet of Things, robotics, machine learning, smart data
- www.tinyurl.com/dfki-eng

Fraunhofer Cluster of Excellence Cognitive Internet Technologies (CIT)

- Founded 2018
- Munich, Dortmund, Kaiserslautern, Erlangen, Chemnitz, Dresden, Berlin, Karlsruhe, St. Augustin
- 100+, including Allianz, Bayer Healthcare, Boehringer Ingelheim Pharma, Deloitte
- Fraunhofer IoT-COMMS, Fraunhofer Data Spaces, Fraunhofer Center for Machine Learning
- Agile and mobile production systems, autonomous driving, data sovereignty, machine learning, informed learning
- www.cit.fraunhofer.de

Cyber Valley

- Founded 2016
- Stuttgart, Tübingen
- 7+, including Amazon, BMW, AIV, Daimler, Robert Bosch, ZF Friedrichshafen, Porsche
- University of Stuttgart, University of Tübingen, Max Planck Institute for Intelligent Systems
- Machine learning, robotics, computer vision
- www.cyber-valley.de/en

De:hub Karlsruhe

- Founded 2017
- Karlsruhe
- 50+, including 1&1, Grenke, Adesso
- Fraunhofer IOSB, FZI Forschungszentrum Informatik, Karlsruhe Institute of Technology
- Energy, mobility, production
- www.de-hub.de/en/the-hubs/karlsruhe

Year founded · Location · Members/project partners · Research facilities · Research Focus · Web Address

»Artificial Intelligence has the potential to transform entire industries profoundly.«

Robert Hermann, *CEO Germany Trade & Invest*

grammed model. The German energy market is another interesting and rapidly-developing arena for AI investment projects. Since 2012, the *Energiewende* (the government's national level energy transition project) has been leading Germany to a decentralized system of energy supply in which renewable energies and energy efficiency technology play a central role. For Peter Geisel, energy market expert at the Swiss energy company Alpiq, this is reason enough to invest in R&D in the German energy market. Alpiq, which develops intelligent solutions for modern energy services such as Gridsense, has recently opened a branch in Germany. "The energy sector is undergoing dynamic change," explains Geisel. Households and businesses are increasingly becoming energy producers, and renewable energy and e-mobility need to be integrated into energy networks. "New smart solutions and artificial intelligence make a major contribution to managing this new complexity in everyday life."

AI sparks energy developments

Alpiq has developed an "Energy Artificial Intelligence Platform" which can record, analyze and evaluate data from power plants, consumers, energy markets and weather stations in real time. On this basis, the "artificial brain" of the platform makes optimal decisions for energy customers and power stations such as when and how much energy should be produced and which energy source to use at what time. "In Germany, customers are open to these new solutions," says Geisel. "The framework conditions for companies such as Alpiq, which offer innovative, new energy services, are therefore very good here."

FACTS & FIGURES

72%

of German employees think that the economy and society at large are going to benefit from AI.

11

The number of times AI is mentioned in the coalition agreement of the German governing parties CDU/CSU and SPD.

€30m

of public funding to flow into four new AI clusters/R&D centers in Berlin, Dortmund/St. Augustin, Munich and Tübingen from 2018.

Source: Bitkom 2018, German Ministry of Education and Research

As a location for AI innovation, Germany has the great advantage of having a large pool of highly trained specialists and experts. They then team up with the entrepreneurs and startups that are clustered around the universities and research institutes (see map "Germany's AI Clusters"). "Germany also attracts many foreign researchers and specialists, because they find good working and living conditions here," says Ada Health's CEO Nathrath. His team in Berlin employs mathematicians, software engineers, physicians and data scientists from all over the world. "We receive inquiries from entrepreneurs, insurers, scientists and health policy-makers around the world who want to collaborate with us to work together to develop smart solutions for the healthcare systems of the future," he says. "We are convinced that over the next few years we will be able to further extend our lead in Germany through our very good research infrastructure in the field of AI." Intelligent assistants such as Ada, the German health assistant, could soon find job opportunities opening up all over the world.

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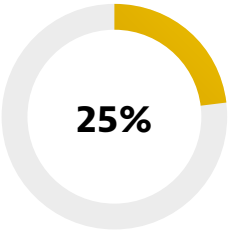
Silicon Valley, *Deutschland*

Since the 1980s the region around Karlsruhe has been the nucleus for innovations in artificial intelligence. The Federal Ministry for Economic Affairs and Energy (BMWi) recently brought it into the de:hub fold, awarding it its own Digital Hub Initiative.

In February, a press release from the startup Things Thinking caused a stir: "Artificial intelligence from Karlsruhe examines coalition agreement: SPD performs well," read the headline. The machine experts had examined whether the contract – which sets out the future cooperation of the political parties in government – contained more content from the CDU/CSU parties or the SPD. The result surprised technologists as much as it did political commentators: for an algorithm to analyze various texts and draw comparisons was a huge step forward, because until now human brains have been streets ahead of algorithms in terms of understanding speech. Now Things Thinking is shifting this paradigm.

The startup from Karlsruhe is part of a cluster of institutes, companies and educational institutions now widely recognized as Germany's most important location for the development of AI. The second biggest city in the state of Baden-Wuerttemberg is home to 26 research institutes, ten incubators and 4,400 digital companies. Within a 400 meter radius you can find renowned research institutions such as the FZI Research Center for Computer Science, the corporate network Cyberforum, the Fraunhofer Institute for Optronics, Systems Engineering and Image Evaluation, and the Karlsruhe Institute of Technology.

FACTS & FIGURES



Percentage of all students at the Karlsruhe universities who are enrolled in degree programs in the field of ICT.[1)]

4,400

Number of companies from the digital economy that have settled in Karlsruhe and the surrounding area.[2)]

1) Source: DIZ – Digitales Innovationszentrum;
2) Source: De:hub

It was no surprise, then, when the BMWi decided to award Karlsruhe its own Digital Hub, as a part of the de:hub initiative, in the specialist area of Applied Artificial Intelligence. Since the launch of the de:hub initiative in early 2017, twelve digital hubs have been launched under the umbrella brand. They form an overarching network that strengthens the Federal Republic as a digital location and makes it easier for foreign companies to invest.

Within the network there are many startups that claim to be producing groundbreaking products, services and disruptive technologies. There are also bigger companies such as the internet service provider 1&1, the software manufacturer Adesso and the financial services provider Grenke, which is joining forces with the newcomers to drive forward innovation. "We are currently working on attracting foreign companies to the network," explains project leader Simon Sulzer, who coordinates de:hub activities in Karlsruhe. Karlsruhe is a magnet for foreign companies who come not only to invest but to find qualified professionals: roughly a quarter of the 44,000 students in the region are studying information and communication technology.

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Artificial Intelligence Will Save Lives

Earlier this year, the Chinese startup Infervision set down roots in the city of Wiesbaden, near Frankfurt. Its representative in Germany, Yipeng Sun, is hoping to transform the healthcare market all over Europe and prove that thinking machines can save lives.

Infervision's intelligent algorithms can detect lung cancer and strokes in X-ray and CT scans with an accuracy of up to 90 percent.

Yipeng Sun only arrived in Wiesbaden in the spring, but already he is determined to transform the German healthcare market through AI. His company Infervision is developing machine-learning algorithms that can detect strokes and lung cancer in X-ray and CT scans with an accuracy of up to 90 percent. Their technology is already widely used in radiology in clinics across China and has been piloted in Japan. "We entered the German market in March 2018," says Yipeng, "and already we have one strategic partner and are looking to increase this number significantly."

Helping doctors make quick decisions

Infervision has set the bar high and plans to expand its network of hospitals to cover the whole country. The startup's promise to healthcare providers is straightforward: to supply them with reliable data to help doctors make clinical decisions faster and more accurately. "We used more than 100,000 annotated medical images to train the algorithms," Yipeng explains. For example, the algorithms can now measure the exact volume of blood lost in hemorrhagic strokes from brain CT scans. "Traditionally, doctors use a mathematical formula based on the health condition and the age of the patient to estimate the amount of blood lost," Yipeng says. The algorithm now provides this vital data in an instant to decide if the patient needs urgent surgery or not.

Infervision started in China in 2016, where it has already partnered with over 140 hospitals. Opening a subsidiary in Germany was the next logical step. The Wiesbaden office will also serve the Spanish, Austrian and Swiss markets, with France and Italy further down the roadmap. "Germany is central to Europe and also enables us to assemble a competitive workforce," Yipeng explains. He holds Germany's workforce and its universities in high esteem: "German engineers are very creative and work hard." To strengthen its position in Europe, Infervision already plans to make more investments including a dedicated R&D facility in Wiesbaden. "There is huge potential here," says Yipeng.

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Textile snow is a tough but glidant high-tech fabric that makes popular winter sports such as skiing, snowboarding, and tobogganing possible all year round. The new material does not require additional power or water.

Photo: MR.SNOW

Textile Innovation

's no Problem

Artificial ski slopes made from mats

Hate waiting for winter to roll around before you can do your favorite sports? You're not alone. This same frustration inspired a trio of German entrepreneurs with a shared passion for winter sports and backgrounds in textiles and engineering to develop textile dry slopes. The high-tech fabric of Mr. Snow is grippy and robust while allowing for easy gliding, and doesn't require regular watering or oiling as similar products do. Whether for downhill or cross-country skiing, tubing, snowboarding or tobogganing, as the startup's website says: "Just roll out the sliding mats and it's already winter!"

www.mr-snow.de

Chemical Industry

Compounding Success

Huge salt plant for food & pharma

The Warsaw-based chemicals giant CIECH Group is investing €109m in a new plant in Stassfurt, Saxony-Anhalt, to produce salt for the food and pharmaceuticals industries starting in 2020. The plant – the biggest greenfield investment in the Group's history – will produce approximately 450,000 tons of evaporated salt a year for western European markets, making it the third-largest producer in Europe. Products will include food-grade salt, salt for electrolysis, tablets for water treatment and pharmaceutical salt. The state is providing €11.25m in subsidies, assisted by GTAI.

www.ciechgroup.com/en

Digital HR

Beyond The Grade

Finding the truth behind the numbers

All recruiters know that the grade point average (GPA) on an applicant's résumé really doesn't say much given the varying grading standards, degrees of subject difficulty and competitiveness at different institutions and in different years. To give HR staff a rounder picture of the top talent, the Cologne-based startup Candidate Select (CASE) has developed an algorithm and extensive database. Besides rating academic achievement, the analysis also looks at the psychological and personality traits that can predict on-the-job performance. The service will soon be available in six European countries.

www.candidate-select.de

Future Plastics

Not Heavy. Not Metal.

"Made in Germany" carbon fiber super plastics

You might never know what CFRTP is, but your back will be thankful for it. Made up of carbon fibers impregnated with polycarbonate, the material is formed into unidirectional reinforced tapes and sheets that can be tuned to infinite combinations. Layering, cutting and laminating them generates a metal-like material that is extremely strong, stiff and lightweight. In fact, CFRTP – exclusively manufactured by the German polymers giant Covestro – boasts the best strength-to-weight ratio of all standard composites on the market and even outperforms many metals, making it ideal for applications such as portable electronics, luggage, auto parts and sports equipment. What's more, unlike many other advanced materials, the ultra-customizable solution enables flexible, cost-efficient mass production.

www.cfrtp.covestro.com

Aerospace

An Algorithm for Jetlag?

Optimally adjusting the body clock

Sixty percent of people who take long-distance flights suffer the disconcerting effects of jetlag. This figure might soon decline, however, thanks to the innovations of jetlite. The startup, based at the Center for Applied Aviation Research (ZAL) in Hamburg, offers an algorithm-based concept to improve lighting in aircrafts and airports, as well as customized nutrition concepts for airline catering and airport services, to mitigate jetlag and thereby enhance traveler comfort and wellbeing. What's more, it is developing a smartphone app that tells passengers the ideal bedtime, light and nutrition starting a few days before a flight. Through the brand chronolite it is also developing solutions for other setting and sectors, such as using light in Porsche cars to boost driver attentiveness.

www.jetlite.de

Renewable Energy

Rotor Blade Recycling

Turning glass fiber into cement

Looming out there on the horizon with all those wind turbines is a big problem: from 2020, large numbers of them will have to be taken out of service. And while most of the revolving giants can be easily recycled, until recently there has been no eco-friendly way to dispose of the glass-fiber-reinforced plastic (GFRP) that makes up most of the rotor blades. Luckily, the Bremen-based disposal specialist Nehlsen has launched an award-winning subsidiary to do just that. Neocomp GmbH shreds the GFRP, mixes it with residue generated in waste paper recycling, and produces a fine granulate that can be used to make cement. Germany's only glass-fiber recycling facility currently serves the domestic wind power industry but it is also set up to process GFRP from other sectors and countries.

www.neocomp.eu

Environment

Pfand-tastic Idea to Go

Coffee cups join Germany's recycling culture

Anyone who's lived in Germany is familiar with the deposit *(Pfand)* system that keeps cans and bottle out of the streets and landfills. Recup, a Munich-based startup launched in December, has transferred the concept to the realm of coffee-to-go cups, which have a huge environmental downside. Recup has formed a network of more than 1,000 cafés and bakeries across Germany offering its unique reusable coffee-to-go cups made of recyclable plastic in three sizes. The concept: cafés and bakeries – locatable via an app – pay about €1 a day to participate in the program, offering reusable cups to customers for a €1 deposit. The customer benefits by getting a small discount. Cafés and bakeries benefit by saving on paper cup expenses and from potential sales from customers returning cups. And we all benefit from the reduced environmental impact of our usual morning pick-me-up!

www.recup.de

A deposit system for eco-friendly, reusable coffee cups has been rolled out across more than 1000 German cafés.

Photo: reCup GmbH

Lights, Camera, *und Bitte!*

Eastern Germany is a magnet for foreign film productions and, with them, foreign investors. From *The Grand Budapest Hotel* to Bollywood blockbuster *Don 2,* the German capital and other cities in the region are stealing the production limelight.

Berlin has long been a darling of the spy thriller genre, especially movies set in the era of cold war intrigue. The unique history of the city, its impressive and varied architecture from Neoclassical grandeur to Modernist functionalism, and the widely-varying climate are all conducive to a range of atmospheric settings and storylines. *The Hunger Games, Bridge of Spies* and popular TV series *Homeland* are just three of Berlin's most recent backdrop appearances.

The number and prominence of films being shot on location throughout eastern Germany is rising. The Saxon city Görlitz is known in the film industry as *Görliwood* for the number of times it has been used in productions. It was voted "Film Location of the Decade" by the European Film Commissions Network for the scenery and architecture on show in Wes Anderson's *The Grand Budapest Hotel*. Potsdam's Babelsberg studios have been instrumental in many other films where the locations were less accessible. Leipzig/Halle airport was the setting for many scenes in *The First Avenger* (featuring Tom Cruise), while Quentin Tarantino's *Inglorious Basterds* was filmed all over Saxony, Berlin and Brandenburg.

"The eastern German states have become popular locations since the fall of the wall," says Oliver Rittweger of the Central German Film Promotion Agency (MDM), which covers the states of Thuringia, Saxony and Saxony-Anhalt. "East Berlin was the center of the East German film industry but there was nothing else notable in the eastern states. But there's a fountain of new locations now, backed up by a good infrastructure created by funding and investment from service providers. And these funds have given, and still give, a certain incentive to film here."

FACTS & FIGURES

€26m

Berlin-Brandenburg's Medienboard's (BBM) annual film fund

€1.25bn

The annual German production fund of the *Deutscher Filmförderfond.*

Source: BBM, DFFF

One of the key attractions of eastern Germany is the range of funding options on offer to help foreign film companies shoot in the perfect location. Berlin-Brandenburg Medienboard's (BBM) film funding department has an annual budget for films shot in the region of around €26m (MDM's is similar), but funds obtained from here can be combined with other federal funds, such as the German Film Promotion Fund *(Deutscher Filmförderfond* or DFFF) or the German Motion Picture Fund (GMPF). Investors looking for bargain locations or well-funded support are unlikely to leave the region unsatisfied and empty-handed.

Film services hotspot Babelsberg

Meanwhile, German film studios, film industry service providers and studio specialists have a good and growing reputation on the international stage. A study by EY shows that it is the sheer diversity of eastern Germany's locations, such as the Berlin Exhibition grounds, or the abandoned chemical factory in Rüdersdorf, which sets it apart, while an association with the world-class studios in

Ralph Fiennes in Wes Anderson's film *The Grand Budapest Hotel,* which was shot in a magnificent disused Art Nouveau department store called *Görlitzer Warenhaus* in Görlitz.

Photo: Sunset Box/Allpix/laif

Babelsberg can actually help to secure investment. Babelsberg-based special effects maestro Gerd Nefzer and his colleagues won an Oscar for their work on *Blade Runner: 2049*.

Berlin-Brandenburg (which includes Babelsberg) and Görlitz remain the two hotspots. Görlitz in particular has built a unique local town economy on its "cinetastic" credentials. The Saxony town was almost completely untouched by the Second World War and is home to some 4,000 historical buildings spanning 500 years of history – enough to cover most aspects of modern Western history. In 2008, Görlitz's Landskron brewery and surrounding streets were even remodeled into the harbor area of New York. Local people have been able to cash-in on the town's big screen fame by running movie-themed hotels and day tours.

But it is Berlin-Brandenburg that remains the location of choice for film and series production. The list of reasons why is long: it has the big town factor and a cosmopolitan feel, it has a diversity of locations, competent studios; and of course it's a magnet for creative filmmakers, well-known producers and home to some famous actors. Accessibility is also a factor: Babelsberg's back-up services, studios and post-production houses are close by on the autobahn.

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Five big international films shot in eastern Germany

Don 2
The First Hindi film shot in Berlin, the second in the blockbuster Bollywood crime thriller series.

Inglorious Basterds
Tarantino's multiple award-winning story about concurrent Hitler assassination plots.

The Grand Budapest Hotel
Wes Anderson's film about a concierge proving his innocence won four Oscars.

The Ghost Writer
Roman Polanski's thriller was filmed in Berlin and Babelsberg's studios, despite being set in London and Massachusetts.

Around the World in 80 Days
Despite the title, the only filming locations outside of Germany were New York, San Francisco, China and Thailand.

Foot off the Brake!

The additive manufacturing industry is entering a period of accelerated growth. As the machines become more economically viable, 3D printing is being adopted across manufacturing, particularly in automobility and aerospace.

Thanks to 3D printing, it was possible to individually customize the radiator hoods of the motorcycles used in the BMW Motorrad International GS Trophy Central Asia 2018. The CAD data was enhanced with the names and start numbers of the drivers and then printed using additive manufacturing.

Photo: © Daimler AG

In January 2018, a small but significant world record was set in Hamburg. Bugatti, the Volkswagen-owned luxury sports car manufacturer, with help from Germany's renowned Fraunhofer institute, made the largest brake caliper the automotive industry has ever seen. For motoring enthusiasts that in itself was a massive achievement, but the caliper also happened to be the largest functional titanium component and the first brake caliper of any kind to be produced by additive manufacturing.

Additive manufacturing – or 3D printing as it is more commonly known – is becoming more widespread and more economically viable for industrial usage. It has come a long way from chess pieces: there are now a plethora of viable products produced in this way, from dentures, body parts and bikinis, to essential industrial components like parts for airplanes.

Germany is one of the leading additive manufacturing (AM) markets in the world right now: a market that is forecast to create significant value and is attracting investors from all over the world. 37 percent of German companies already use AM. The machinery and equipment sector (a traditional German stronghold) is increasingly looking at 3D solutions from both the supply and demand side. The clamor from customers for the kind of tailored machine parts that only a 3D printer can produce easily grows by the day. To match the rising demand, machine manufacturers are turning out cost-effective and efficient machines for faster printing.

Germany leads in 3D printing

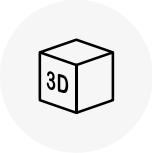
Oliver Sorkin, vice president Europe at Formlabs, an American 3D printing company with an office in Berlin, explains why Germany is capable of meeting the demand. "Three factors are always critical in Germany," he says. "Firstly, Germany is a place for manufacturing, both for hardware generally, and specifically in the field of medicine. Secondly, a large number of our customers, CAD/CAM users in advanced dental technologies, are in Germany. And last but not least, the conveyor belt of talent in Germany, together with the world-renowned universities and education institutions make Germany a hub in central Europe."

FACTS & FIGURES

$7.8bn

Projected value of the AM industry in 2018 – equivalent to 21% growth

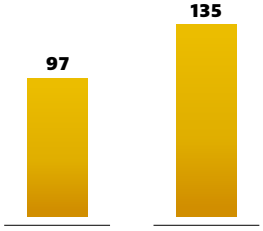
Sales data



80%
Increase in sales of metal AM systems between 2016 and 2017

37%
German companies already using 3D printing solutions

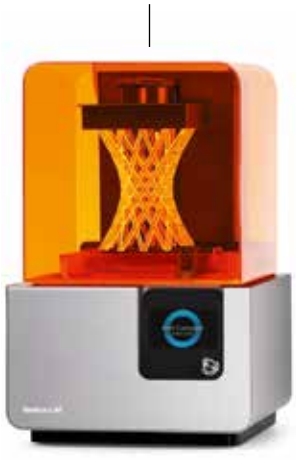
Growth sector



Number of companies around the world producing and selling industrial AM systems

The product

Formlabs' Form 2 3D printer delivers high-resolution parts at a fraction of the cost of industrial printers and with a small carbon footprint.



Source: Wohlers Report

The two industries that are set to be revolutionized by 3D printing according to EY are aerospace and automobility: industries in which Germany is traditionally strong. Aerospace, which demands ever-lighter, more geometrically complex parts in ever-smaller batches, has become an early adopter of the technology. The auto industry's take-up of AM is projected to increase from $365.4m in 2015 to $1.8bn in 2023, resulting in a staggering 19.51 percent Capital Annual Growth Rate (CAGR).

Other industries will also benefit from the infinite versatility that 3D printing methods offer. "The advances in prototyping, where we began, to low-volume production, small-batch manufacturing and mass customization is relevant to all industry sectors and is growing proportionately across all markets," Sorkin points out.

New age of manufacturing

Bugatti's achievement earlier this year was to a large degree enabled by the R&D activities of the Fraunhofer IAPT in Hamburg. Unsurprisingly perhaps, the Fraunhofer research family is a major stakeholder in the growth of additive manufacturing R&D. The Fraunhofer Additive Manufacturing Alliance brings together 17 institutes throughout Germany and along the additive manufacturing process chain.

For a young industry, 3D printing "has come a long way in a remarkably short space of time," comments Max Milbredt, GTAI expert for additive manufacturing. "Achievements such as Bugatti's caliper, or statistics in surveys such as the recent VDMA finding that nearly every other machine-building company is using 3D-printed parts, show this." He believes the technology is on course to fundamentally transform manufacturing processes. "On the current trajectory, it seems that additive manufacturing is not only useful to end-product consumers, but also approaching readiness for industrial usage, which would be a huge business opportunity."

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Photo: Formlabs, Inc.

The Spirit of Bauhaus

Foreign companies and investors value Germany's product design expertise as much as they rate Germany as a first class industrial location, explains industrial design expert Uwe Gellert.

MASTERS OF DESIGN

For some years now, Germany has been known as a global export champion. The "Made in Germany" label is recognized as seal of quality and reliability worldwide, while demand for German products – from automobiles to washing machines and razors – remains high. Product design plays a significant role in Germany's export success, maintains the **industrial design expert Professor Uwe Gellert.** Gellert has worked for internationally-renowned companies in a number of industries. After gaining experience abroad, he founded the design office Quantis and designed, among other things, laboratory technology and machine tools. He now teaches product design at Anhalt University of Applied Sciences in Dessau, one of the leading design cities during the Bauhaus period from 1919 to 1933. *Markets Germany* spoke to him about why German design is so attractive to foreign companies.

Mr. Gellert, what can you tell us about Germany's reputation as a center for good product design?

UWE GELLERT: Germany has a good reputation. We still benefit from the Bauhaus era. In fact, many German product developers still follow its design principles. Their role is not simply to beautify products, to decide on material, color and shape, but rather to develop a concept that promises easy handling of the product. Design is a complex process – the value and benefits of a product are deeply rooted in its design – and German developers approach this process particularly strategically. The design language in this country is still strongly characterized by ergonomics and usability.

Which recent global design trends have their roots in Germany?

GELLERT: Germany is a giant in industrial technical products and stands for precise and reliable technology. German design is characterized by clever ideas, pared down to the essentials, and without unnecessary embellishment. There are numerous examples of successful German design trends, such as the design classics produced by electrical appliance manufacturer Braun in its early years.

Is it fashionable for foreign companies to have new products designed and developed in Germany?

GELLERT: Yes, absolutely. It is not only fashionable but relatively straightforward: foreign companies can either set up a business here or hire German design service providers and agencies. There's also a trend for foreign companies hiring design graduates from German universities. That's why more and more foreigners are coming to Germany to study.

Why are product design courses at German universities so popular with foreign students?

GELLERT: Our universities have understood that there are no more pure product or graphic designers. Many applicants to our university in Dessau want to study groundbreaking Bauhaus design but they must appreciate that the requirements have changed. We take Bauhaus values and traditions and use them in new fields. For example, we offer an integrated degree program that includes corporate and editorial design as well as product design or digital publications, utilizing all the new interactive and smart applications. We also see a product as a multi-faceted concept in which various factors are at play.

What do these developments mean for Germany as a design location?

GELLERT: In my opinion, German designers are increasingly under pressure from international competitors and must be careful to remain on top. The Dutch, Spanish, Danish and especially the Chinese are getting stronger in the design field. While Germany's traditional strengths such as the use of high-quality materials are important to consumers and companies, they also come at a price. So, as design gets increasingly similar and the playing field starts to level out, I wonder what is more important in our fast-paced society: a long shelf-life or just a cheap price?

How can Germany assert itself?

GELLERT: I hope that while keeping its reputation for reliability and quality, Germany will also be a pioneer in terms of sustainability and environmental issues. New and smart materials have great potential and many high-quality materials can and should be reused. As a global export champion, Germany has a certain responsibility.

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Photo: Uwe Jacobshagen

Design Legacy
The Bauhaus Phenomenon

The Bauhaus is still remembered as the most famous school of design of the modern era. In 1919, Walter Gropius founded the school of art in Weimar, Germany with a dream of combining art and craft. For the last hundred years Gropius's ideas have set the standard for successful design. If something is functional, it is also esthetically pleasing. Bauhaus products are "fit-for-purpose": form follows function and utility and efficiency are valued more highly than decoration. With this philosophy at its heart, Germany has established itself on the international design market as the true North for industrial designers and has taken the lead with high-quality, simple products. Even a century on, Bauhaus design principles still serve as the basis for many successful products.

The iconic MR10 Side Chair designed in 1927 by Mies Van Der Rohe. In 1930 he accepted the appointment as director of the Bauhaus in Dessau and began his academic teaching.

Photos: picture alliance/Arcaid, Berthold Steinhilber/laif

A Tale of Two Smart Cities

Urbanization and climate change are creating mounting challenges for cities around the world. Smart city projects across Germany are developing and testing new solutions and sustainable models for the cities of tomorrow.

With 55 percent of the world's population now residing in built-up areas, humanity has become an urban species. In just over 30 years, another 2.5bn people will reside in cities. Across Germany, smart city projects have been launched that employ urban tech, ICT and the Internet of Things to address the social, economic and environmental challenges caused by growing urbanization. The projects are often run in collaboration with the private sector, universities and local utilities and aim to develop solutions for the cities of the 21st century.

"We need to change our approach toward everything from transportation and energy to climate resilience and resource efficiency if our conurbations are to continue to function and provide citizens a good quality of life," says Rob Compton of GTAI, who helps companies offering urban solutions to expand to Germany. "We're seeing international investment coming from the ICT, e-mobility, logistics, green construction and environmental technology sectors especially."

Compton says German smart cities provide an ideal model for urban planners worldwide because many of the country's cities and towns have a broad range of buildings and infrastructures and are not especially large. "Half of the world's urban population resides in cities with fewer than 500,000 inhabitants, which means the smart living labs here are perfect for developing solutions that can be replicated around the world," he explains.

DIGITAL CITIES

What's in the Smart City tool kit?

There are few aspects of urban living which will not be transformed in the smart cities of the future...

Smart city approaches encompass technical, digital and social innovations that aim to make cities more efficient, ecological and resilient in the face of urbanization, shifting demographics and climate change. The smart city tool kit includes digital approaches based on big data, the Internet of Things including sensors, the ubiquity of the smartphone and "analogue" concepts such as intelligent city planning and social initiatives.

Modernizing Munich

Nevertheless, one of the largest smart city projects is being carried out in Munich, which by 2035 is expected to see its population rise by about 300,000 to reach 1.85m. Bernhard Klassen, project leader of the E.U.-funded project "Smarter Together Munich" in the City of Munich, outlines the scope of the project: "We're working in two neighborhoods that have around 30,000 residents and buildings from the 60s and 70s as well as new construction. This diversity makes the area ideal for testing new ideas," he says.

The project aims to refurbish around 600 residential apartments to make them more energy-efficient. In addition, the project is providing funding to modernize building envelopes and heating systems, as well as for new solar-thermal and PV systems.

"The PV systems can send surplus generation to a central virtual power plant with battery storage, which helps improve grid stability. The district heating network, which is fed from a local geothermal plant, is being fitted with ten innovative heat substations to ensure low return temperatures to the grid, which greatly improves efficiency," Klassen notes.

Specially designed smart LED lampposts with extra space inside for additional equipment have been erected. Environmental monitoring, parking management, adaptive lighting, free Wi-Fi, traffic control and adaptive lighting are just some of the ideas being tested. "We're keen for companies to get involved through the regular calls for tender," says Klassen.

Small and smart: Bottrop

At the other end of the scale, Bottrop, with a population of just 117,000, is one of Germany's smaller cities. In 2010, Bottrop was selected by the InnovationCity Ruhr com-

The Tetrahedron is a viewing platform which stands over the Beckstrasse slag-heap in Bottrop, North Rhine-Westphalia. Part of the Route of Industrial Heritage, it offers a panoramic view of the Ruhr area.

Photo: Gaasterland/laif

petition as a "typical town" to become a role model for the renovation of the entire Ruhr region, the largest conurbation in Germany with more than five million inhabitants. The initiative comprises 300 projects in a neighborhood of 70,000 citizens.

"The Ruhr region has long been home to heavy industry such as iron and steel foundries and coal mining," says Rüdiger Schumann from Innovation City Management, which runs the project. "However, the industrial landscape has changed and now Bottrop is pursuing a rigorous program of urban redevelopment that respects its industrial heritage," he continues.

"Many of the buildings in the project area were built between the 1950s and 70s, so we've had a strong focus on energy-efficient building renovation. Other central elements are energy storage and new renewable generation capacity, e-mobility and new ways to reduce freight and passenger traffic, as well as to create an attractive cityscape and develop climate-resilient land use."

The project has seen 1,000 buildings undergo energy-efficient renovation and the installation of a heat network and 100 cogeneration plants. Green façades and living roofs are being created to assess their ability to reduce the heat island effect, where urban areas are significantly warmer than surrounding rural areas. "Model City Bottrop has proved a great success in so many ways," says Schumann. "It has now been rolled out to 20 further areas and that's something we're very proud of."

"Perhaps most importantly, civic engagement has been at the heart of both projects," Compton notes. Germany's living labs are being watched closely and will help shape the future of cities around the world.

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TRANSPORTATION

E-mobility powers ahead in Munich

From EV charging stations to electric tricycles, there are green solutions for all.

Eight new e-mobility stations will be installed in Munich to complement existing public transportation. The stations bring together the city's car sharing scheme including ten extra electric cars, the existing public bike rental system, electric bicycles and electric freight trikes, EV charging stations and a central information display. Two of the stations will feature district sharing boxes, which resemble the luggage lockers at train stations. Companies can use them as central delivery points, reducing the volume of delivery traffic. Local shops can also deliver to the boxes, some of which are refrigerated. This means residents can pick up regional produce that is delivered while they are at work, thus benefiting the local economy. The first station opened in July.

Old to Gold

Berlin-based startup Auto1 has quickly become the biggest used car dealer in Europe, thanks in part to foreign investors who saw the potential in the fast-growing company and the rising demand for used cars over new vehicles.

Auto1 Group operates online car trading platforms that enable individuals and dealers to buy and sell cars throughout Europe, including wirkaufendeinauto.de and autohero.com for consumers and its B2B arm auto1.com. Auto1 guarantees that it will buy every used car regardless of make, model or condition and it also takes the hassle out of selling by handling the red tape for customers, for example canceling car registrations.

Earlier this year SoftBank Investment Advisers, a division of Japanese technology giant SoftBank Group Corp., invested €460m in Auto1 through its SoftBank Vision Fund in return for a 20 percent share. The investment increased the group's value to €2.9bn, making it the most highly-prized startup in Europe after Spotify, and will support its international expansion plans.

Established in 2012 by joint CEOs Christian Bertermann and Hakan Koç with a team of seven employees, Auto1 now boasts a workforce of more than 3,000 and operates in over 30 countries through 45,000 dealer partners.

Auto1 is experiencing strong organic growth, both in sales and the expansion of its on-site branch presence, according to Bertermann. Annual revenue last year rose 47 percent to €2.2bn, while the number of car sales reached 420,000, up from just 224 in its first year. Its success reflects the current boom in Germany's used car market – last year twice as many used cars were sold than new cars.

INNOVATORS

The joint CEOs and co-founders of the Auto1 Group Christian Bertermann (left) and Hakan Koç at their Berlin headquarters.

420k
Total number of vehicles sold by Auto1[1)]

€2.2bn
Total revenues taken by Auto1 in 2017[1)]

7.3m
Total number of vehicles resold in Germany in 2017[2)]

€85bn
Total value of used cars sold in Germany in 2017[2)]

1) Source: Auto1; 2) More than double the number of new cars. Source: Handelsblatt/Federal Statistical Office

Revving up the market

In an interview with German newspaper Handelsblatt, the CEO of SoftBank Investment Advisers Rajeev Misra said Auto1 was "very well positioned" to fundamentally change the used car market. "We want to turn Auto1 into a global company," he added. In addition to its European presence, the company is set to expand into the U.S., China, Japan and other markets.

Auto1's proprietary technology – in particular an algorithm that determines the value and price of a car that the company is prepared to pay a private seller in seconds – is what piqued interest from the fund's operators. "Auto1 Group has built a fast growing, data-enabled platform introducing efficiency and transparency to the fragmented used car market, which is worth more than $300bn annually," says Akshay Naheta, a partner at SoftBank Investment Advisors, who is now on the Auto1 board.

Describing SoftBank as a strategic partner "who shares our vision of connecting the world's supply and demand for mobility," CEO Koç comments that the Vision Fund investment and technology expertise will support Auto1's continued growth. Auto1 will keep its foot on the accelerator until it reaches its long-term goal of ten percent European market share.

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Photo: AUTOI Group GmbH

Common Goals in Madrid

Germany Trade & Invest and the German-Spanish Chamber of Commerce complement their services in order to create business opportunities for German and Spanish companies in both countries. How exactly do they cooperate and what binds these two major euro economies together?

Working together to promote Spanish-German economic relations: Miriam Neubert, GTAI correspondent in Madrid since 2014 and Walther von Plettenberg, CEO of the German-Spanish Chamber of Commerce since 2010.

The German-Spanish Chamber of Commerce (AHK Spain) celebrated its 100th Anniversary 2017, while Germany Trade & Invest sent its first correspondent to Madrid 60 years ago. The two have been at the same address for a long time and the current renovations within the AHK are tending toward it becoming a co-working space. *Markets Germany* asked Miriam Neubert, head of GTAI Madrid and AHK Spain CEO Walther von Plettenberg what makes the Iberian peninsular country so interesting for Germany.

Mr. von Plettenberg, Spain fell into a deep recession during the global financial crisis, but is now recovering. How is the feeling about the economy at the moment?

VON PLETTENBERG: Positive. The domestic economy has shown three consecutive years of three percent-plus growth and is expected to grow more moderately but still robustly in 2018 and 2019. Many companies did not survive the recession, but the more competitive ones have managed to export their way out of the crisis. While the large companies have been active in Germany for a long time, more medium-sized companies are also muscling in on the action now. But at only 0.6 percent of all Spanish companies, this group is over four times smaller than in Germany.

Ms. Neubert, which industry in Germany is most interesting to Spanish companies right now?

NEUBERT: Those industries in which Spain is strong; renewable energies, for example. The energy company Iberdrola has invested €1.4bn in the Wikinger Offshore Windpark, close to the Island of Rügen in the Baltic Sea, and is developing its capacity further. The health industry is also interesting: Grifols, a top producer of plasma-based medicines, has spent €220m buying 35 German plasma-donation centers. The ties in the car industry are traditionally close as Spain is the second-largest car producer in Europe after Germany.

Is the "Made in Germany" brand significant in Spain as a mark of quality?

NEUBERT: Very much so. Germany is frequently a benchmark, not only for technology, reliability and efficiency, but also for its domestic assets such as the mid-sized manufacturers known as *Mittelstand,* its industrial strength and vocational education and training.

VON PLETTENBERG: This positive perception is backed up by the German companies operating in Spain due to their success and their long-term engagement.

How do the AHK Spain and GTAI support each other?

VON PLETTENBERG: The GTAI office provides comprehensive market reports, special sector analysis and actual economic data for Spain and Germany we can always rely on. AHK Spain advises German and Spanish clients, organizes bilateral entrepreneur meetings, promotes a German-Spanish startup ecosystem and implements vocational training.

NEUBERT: We coordinate our efforts. When interested parties come to our doors, our services complement each other. The latest example is an "Observatory" in which the AHK Spain publishes GTAI fact sheets in Spanish on interesting investment industries in Germany.

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Dr. Walther von Plettenberg, CEO of the German-Spanish Chamber of Commerce

Photo: AHK Spanien

Speaking for Germany

Peter Altmaier is the Federal Minister for Economic Affairs and Energy. *Markets Germany* talks to him about prospects for the automobile and energy industries, the "Made in Germany" brand, and what is attracting foreign investors.

Mr. Altmaier, Germany has the largest population in Europe, the "Made in Germany" brand is unique and is often a decision-clincher for success overseas. Germany's research landscape is at the forefront in the world, its workers are well-educated and motivated. Yet there is a shortage of skilled workers, the expansion of broadband is lagging behind and – in comparison with other European countries – the energy prices are high. How would you convince a foreign investor to come to Germany?

PETER ALTMAIER: Germany is an open, attractive and world-renowned investment location. Investors can build upon the foundations of well-educated workers, a stable, quality environment and great legal security. Foreign direct investment in Germany has risen consistently since 2010, 20 percent overall against the 2010 level, and in 2015 it reached a value of €466bn. Some 80,000 foreign companies, employing around 3.7m people, are located in Germany. These stats paint a very clear picture: Germany is a good location for foreign investors.

Reliability and Germany – these used to be synonymous in German products and in German politics. But the diesel emissions scandal and the somewhat drawn-out process of forming a government have harmed that image. Is it lasting damage? Or is it simply a case of the country having problems just like any other?

ALTMAIER: I don't really see much damage to the overall image. The diesel emissions scandal is a warning for the leadership and governance in the companies involved. But in the wake of the scandal the government itself has put into place a series of concrete measures to prevent any repeat – for example, producers must now perform the test procedures on their emissions systems publicly, emissions testing in real road conditions has been extended and a public testing laboratory is being built at the Federal Motor Transport Authority. And while it is correct that the process of forming a government took some time, there were extraordinary circumstances surrounding that process that are unlikely to be repeated.

> ***»Germany is an open, attractive and world-renowned investment location.«***
>
> ***Peter Altmaier***
> *Federal Minister for Economic Affairs and Energy*

The automotive industry is crucial to Germany's economy. In electromobility, however, there is already very strong competition and the industry is facing huge challenges. Can Germany remain at the pinnacle of the global automobile industry?

ALTMAIER: The automotive industry is by some distance the most important industrial sector in Germany's economy, with 820,000 employees and a turnover of €423bn in 2017. It is a world leader in product and process innovation. The industry has to start using this know-how actively if it is to continue playing a leading role in a continually changing global market. The industry must set itself the target of remaining a global leader.

Photo: Jonas Holthaus/laif

In March, Peter Altmaier was appointed Federal Minister for Economic Affairs and Energy.

2013-2018
Head of the Federal Chancellery, Federal Minister for Special Tasks and the refugee coordinator of the German Federal Government (since 2015).

2012-2013
Federal Minister for the Environment, Nature Conservation and Nuclear Safety.

2009-2012
Parliamentary secretary of the CDU/CSU parliamentary group.

2005-2009
Parliamentary state secretary in the Federal Ministry of the Interior.

2004-2005
Parliamentary legal counsel of the CDU/CSU parliamentary group.

Peter Altmaier is a passionate believer in free trade. He openly welcomes foreign investors to Germany but remains cautious of what he calls "state-driven strategic investments."

How would you convince an energy-intensive company to locate to Germany?

ALTMAIER: For the same reasons as any other company: they can rely upon excellent infrastructure and superbly-educated labor. There are innovative clusters and an excellent R&D landscape. High energy prices are not a competitive disadvantage. Under the existing balancing system, the energy costs for energy-intensive companies are, relative to other parts of Europe, low – and that with an extremely reliable supply.

We have made huge steps in Germany toward restructuring our energy supply while keeping energy-intensive industries in mind. This will remain so, as we know that energy-intensive companies are at the centre of industrial value creation in Germany. They don't just supply the ideas for the energy transition either, rather they contribute to the process with their energy efficiency optimizations, increased flexibility and improved load management.

Are Chinese investors still welcome in Germany? The attitude toward Chinese companies seems recently to have been somewhat critical, both in public and in politics.

»Germany is in a better state than it's ever been, in spite of global uncertainty.«

Peter Altmaier, *Federal Minister for Economic Affairs and Energy*

ALTMAIER: The E.U. and Germany are open investment locations. This is a good thing and should remain so. Local and foreign companies are, as a rule, treated exactly the same. But our open doors must not be an invitation for the industry-political or geo-strategic interests of other states, with state-owned or state-sponsored companies who endanger our critical infrastructure and thereby threaten national security. And we demand fair competition both in trade and investment. For example, trade barriers and unequal treatment of foreign companies prevent German companies in some locations overseas from realizing their full value potential. We will therefore continue to make representations for the removal of all barriers and a level playing field.

Can Germany still afford to strongly represent free markets and be so open to foreign investors, given the current protectionist tendencies throughout the world?
ALTMAIER: I have always been clear on this: an end to open markets is useless for us. Seclusion negates growth. We stand for a free, fair and well-regulated trade environment. And we are now standing together with Italy and France to call for the creation of an E.U. framework to examine foreign direct investments. Member states must be equipped with the right regulatory systems in order to detect, regulate and/or prevent state-driven or state-financed strategic investments.

Do you still think that Germany benefits from a free market and foreign investors?
ALTMAIER: Yes I do. Germany is in a better state than it's ever been. In spite of all the current global uncertainty, Germany's outlook is positive. The global economy continues to grow and strengthen Germany's export sector. Germany's economic health is closely linked to the global economy. A strong export economy needs open markets. So we need to continue our trade interests without escalating any conflicts. That can only exist with our European partners: even if other countries seem to be shying away from multilateral cooperation, the E.U. has to be a fair and reliable trading partner.

Employee rights in Germany are extremely strong. Many businesspeople in other countries just don't get the institutions of works councils or the voting rights of employees within companies. How do you convince potential investors about the "German model"?
ALTMAIER: Employee representation in Germany is a major foundation of our social market economy and an integral part of German corporate and company culture. The "German model" provides a regulated system for conflict resolution that contributes to social harmony, which makes it an important location factor for investors. Not least because of this was the German economy able to survive the effects of the global financial crisis better than many other industrial countries. So employee representation is a location advantage to investors.

How important is digitalization for Business Location Germany? Is it an opportunity or a threat?
ALTMAIER: Above all, it is unstoppable. But the digital transformation brings huge opportunity for companies and the population. It is now up to companies to recognize the signs of the times and adapt to them, particularly those producing for the global market. We will stand close by and consult with the companies to some extent in the *Mittelstand 4.0* competence centers. As artificial intelligence is becoming the key technology of the future we must be leaders in this field and not depend on others. And crucially, Germany and Europe must be leaders in transferring and sharing innovative solutions.

Germany, and especially Berlin, is one of the world's most attractive locations for startup founders. But the debates on refugee immigration and the success of populist political parties could cause foreigners to doubt whether they really are welcome. Against this background, how would you convince a foreign founder to come to Germany?
ALTMAIER: Germany is and will remain an open country and a good location for international companies and their employees. The current debates, however heated they may get, don't change that. Fortunately, the relevance of populist parties is much less here than in other major countries in the world, despite the fall-out from the 2015 refugee crisis. In pretty much every industry there are successful entrepreneurs with immigrant roots. There are generous assistance programs for innovative founders and ideas, such as the EXIST program, where almost 20 percent of the participants are of foreign origin. The pilot project "Startup your future" actively targets introducing refugees to experienced entrepreneurs in the Brandenburg-Berlin region.

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