

MARKETS

GERMANY

3/17

Cinematic Volume Rendering Technique (VRT): a research visualization technology that here enables a high-resolution, anatomical image of the brain, merged with colorful tractography data.

HEALTHY OUTLOOK

Germany is a vital test market for foreign medical technology companies. Turnover potential is high and exports are strong. There are numerous new investment opportunities, from prosthetics and software to smart labs.

Robot Revolution:
***From production
through to healthcare,
robots are taking over***

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***Germany is in the
hot seat of the global
semiconductor market***

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how renewables can
deliver energy stability***

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TECHNOLOGY



Robot Revolution

A look at the investment landscape in the growing field of robotics, from production through to healthcare.

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The Power of Tiny

Germany's increasing importance in the global semiconductor market and how microelectronics will change our world.

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INVESTORS



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INVESTORS

Japan and Germany

GTAI's "man in Japan" on a very special business relationship and JGIF 2017.

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»Whoever makes it in Germany can make it anywhere in the world.«

Dear Reader,

With a turnover of €337bn, the medical technology market in Germany is already one of the largest in the world; it is growing at an annual rate of about four per cent and the trend is likely to continue as a result of the aging society.

In addition there are 2,000 hospitals, university hospitals and top-level research institutes employing excellently-trained specialists, who also work at the mostly small and medium-sized German companies in the medical technology sector. With an export rate of 64 per cent, they are among the winners in a globalized market and are often trendsetters with their products: they are hidden champions, which Germany and the medical technology sector is full of.

Anyone who is successful here – this is what entrepreneurs say – becomes a part of this huge market and the highly innovative environment.

This is not easy. The health system is highly complex, the market strictly regulated, the competition big and hard. Profound knowledge of the market, of the legislation, of the entire environment are prerequisites for successful engagement in Germany. Local contacts are essential. But the effort and the costs are worth it.

“Come to Germany to be a world leader,” says Sebastian Gaiser, Policy Advisor at Johnson & Johnson, in an interview with Markets Germany. There is little to add.

Dr. Jürgen Friedrich / CEO
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ONE TO WATCH



Photo: Delivery Hero / David Pettersson

Niklas Östberg, CEO of Delivery Hero

Niklas Östberg, CEO of Delivery Hero, the Berlin-based online food ordering service, has a simple vision: “we make hungry people happy.” In less than ten years, he has grown his company from a handful of restaurants in the north of Sweden into a global leader, processing over 20m orders per month from 40-plus countries and posting revenues of €121m for Q1 2017 – double the amount for the same period in 2016.

When the Swedish entrepreneur first sampled some online food services in 2007, he recalls being “fascinated by the idea of food magically appearing at your fingertips.” So he saved up €60,000 to launch the company. “Up until 2008 half the budget went on

the development of an order terminal and the order functionality of the website,” he says.

His early emphasis on speed and convenience has paid off. Delivery Hero has been far more successful than its competitors like Just Eat, which launched in Sweden in 2008. So what has been its recipe for success? “Local teams fighting for their customers, knowing their local customers and knowing the local peculiarities,” says Östberg. This has been achieved by partnering with market leaders in new territories: for example Talabat in the Middle East and recently AmRest in central Europe.

Östberg’s knack for securing investment at the right time – he raised €387m from

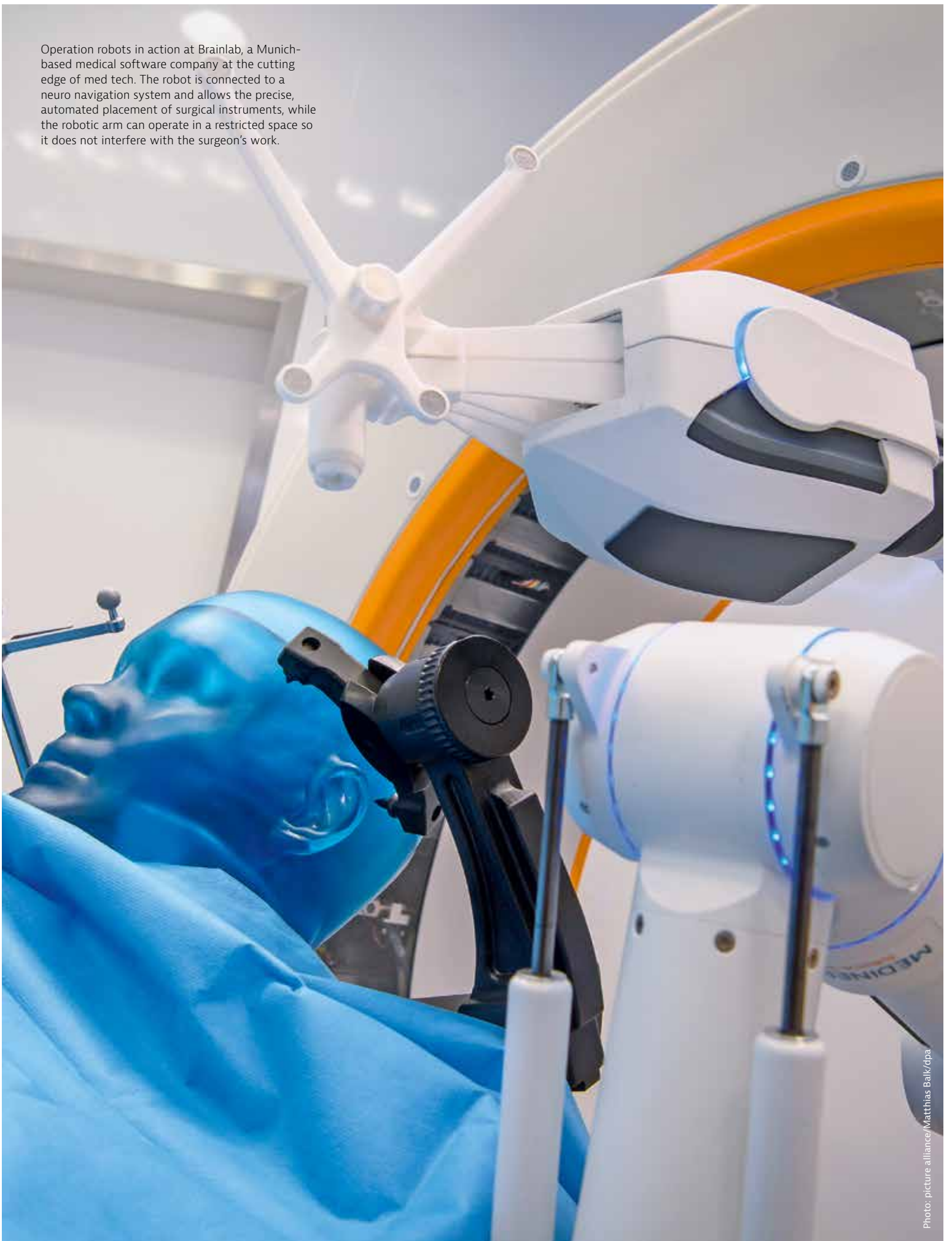
Naspers in May – has enabled his company to grow rapidly. Recent acquisitions include rival German firm Foodpanda and the Middle Eastern food delivery platform Carriage. In June, it floated on the Frankfurt stock exchange in the largest listing by a European technology business for two years, raising almost €1bn.

Luckily for Östberg – whose schedule has been non-stop this year – he will never have to cook again. He is currently enjoying munching his way through the menus of the Asian restaurants in his network.



www.deliveryhero.com

Operation robots in action at Brainlab, a Munich-based medical software company at the cutting edge of med tech. The robot is connected to a neuro navigation system and allows the precise, automated placement of surgical instruments, while the robotic arm can operate in a restricted space so it does not interfere with the surgeon's work.



Healthy Outlook

Germany is one of the world's leading medical technology markets: the revenue potential for companies is high and exports are strong. This is why it is a key market for foreign medical technology companies, with a myriad of opportunities.

The robot gripping arm from the Canadian company Kinova Robotics is a boon for wheelchair users who have little or no movement in their arms. With the arm, they could, for example, open the refrigerator, take out a bottle, pour a glass and drink something without assistance.

Headquartered in Quebec, Kinova is one of the most successful growth companies in the medical technology (med tech) industry in Canada. After operating in Germany for several years, the firm opened a sales department there at the start of 2017. "Germany is the leading market in Europe," says Peter Fröhlingendorf, MD of Kinova Europe in Bonn. "The revenue potential is great and the customers more demanding than elsewhere. If the Germans are impressed by a product, that is a good argument for sales in other countries." Fröhlingendorf sells the robotic arms to special-

Germany is a reference market for the introduction of innovative technologies.

ized medical centers, whose technicians adapt the product to their customers' wheelchairs. "We get a lot of feedback and are in close contact with the retailers. This cooperation with the technicians is by no means as common in other countries as it is in Germany. It requires effort. On the other hand, it allows us to make our products the very best they can be."

An important test market

There are several factors that make Germany highly attractive to foreign medical technology companies. The country's healthcare market is one of the largest in the world, worth €337bn. Its med tech market is the largest in Europe. Furthermore, many well-trained physicians work in some 2,000 hospitals nationwide, as well as in university clinics and research institutes. Meanwhile, highly-qualified researchers and engineers are driving

TRADE FAIR UPDATE

GTAI at MEDICA



Every year in November, the world's largest medical technology fair MEDICA takes place in Düsseldorf, Germany. In the past year, 128,000 international trade visitors were informed about the latest trends in medical technology with 5,000 exhibitors from 70 nations, for example in electro-medical/medical technology, laboratory technology/diagnostics, physiotherapy/orthopedic technology, consumer goods and information and communication technology. You will find GTAI in hall 15, booth 15F37. At the same time, COMPAMED takes place at the Düsseldorf exhibition center, where the most important medical technology suppliers show their latest innovations. Most recently, 750 exhibitors were represented there.

→ www.medica-tradefair.com

maining 12m Germans have a private health insurance. The GKV's medical service checks whether a new product fulfills certain criteria before offering cover. "At any rate, you need someone here in Germany who is very familiar with the system," says Kinova Germany's MD Fröhlingdorf.

The Federal Joint Committee (GBA) also plays a key role for med tech companies: it defines the principles according to which the statutory health insurance funds provide medical cover to their members and is involved in the practical implementation of legal regulations on medical technology. Recently, European legislators have revised the requirements for new medical products: manufacturers of high-risk products in particular will have to demonstrate more clearly the extent to which they are generating a greater benefit or lower cost than conventional technology before the health insurance funds will cover the costs.

Med tech ecosystem

"How exactly this new process of testing will look in practice is still to be seen," says Sebastian Gaiser from the American medical and pharmaceutical group Johnson & Johnson, which operates several production plants in Germany (see interview). "It is therefore even more important for med tech companies to get involved in the process and to establish a dialogue with the investigating bodies. This applies irrespective of the size of the company." It is particularly helpful for newly-established medium-sized companies to be located in one of the many med tech clusters around the country, as private and state funding is relatively easy to obtain where companies, research institutes and clinics work closely.

The density of high-caliber research institutes in Germany is an important draw for foreign companies. The institutes are familiar with local conditions and can support partners in R&D. The Fraunhofer Institute

innovation in the industry. The German market thus offers a good basis for developing and launching new products and processes. "Germany is regarded as an important reference market for the introduction of innovative technologies," says Joachim Schmitt, MD of the med tech industry's association (BVMed).

At the moment, the German healthcare market is growing by almost four per cent per year, which is stronger than the German economy as a whole. Many factors are responsible for this growth: for example, the number of elderly people has dramatically increased and is expected to reach 10 per cent of the total population by 2020, with up to 3m people needing care – rising to more than 4m by 2050. The demand for nursing technology is correspondingly high. Digitization has also spurred growth: an electronic health card has been recently introduced and patients are more open to using e-health services. According to the IT industry association Bitkom, 90 per cent of Germans already use health apps or would do so in the future and 75 per cent would like to receive test results in digital form. The German market for mobile health was valued at €3bn this year.

Market insights

Medical technology is one of the most important sub-sectors of the German healthcare

market. Med tech imports have risen from €9.5bn in 2005 to more than €15bn per year. Most med tech companies in Germany are SMEs employing less than 250 employees; a large proportion are internationally successful and the average export rate is 64 per cent.

But if you want to gain a foothold in the German market, you need to adapt to the country's complex healthcare system. In Germany, most citizens have some form of statutory health insurance (GKV), which covers more than 70m Germans. Most of the re-

»If the Germans are impressed by a product, that is a good argument for sales in other countries.«

Peter Fröhlingdorf, Kinova Europe

for Production Technology and Automation (Fraunhofer IPA) in Stuttgart is one of the largest, with around 1,000 employees, including some 80 med tech specialists. The experts are primarily engaged in the field of orthopedics and laboratory/clinical automation and cooperate with 30 other Fraunhofer institutes. "In this way, we get expertise at the highest level on many special topics where there are intersections to other research areas," says Urs Schneider, who is responsible for medical engineering at Fraunhofer IPA.

In addition, the researchers work closely with university hospitals across Germany and abroad, especially in the U.S. market.

"Medical technology is a global industry, so we are also doing research globally," says Schneider. In addition to their technical expertise, Schneider and his colleagues know the regulations in their home country, with all their specialties and ongoing changes: "You need both in medical technology research and development: know-how at the highest international level and at the same

time knowledge about the situation in the local market."

Academic research is key

The medical engineering department of Fraunhofer IPA works largely on behalf of industrial companies. The researchers create feasibility studies, build and test complete prototypes of medical devices such as prostheses and implants or machines on test stands and assist companies in the evaluation of benefit calculations, taking account of



FACTS & FIGURES

210,000

people
are employed in the German medical technology industry¹

1/3

of sales
in medical technology products in Germany comes from products that are less than three years old¹

7m

people
in Germany work in the health care sector – 1m more than 12 years ago²

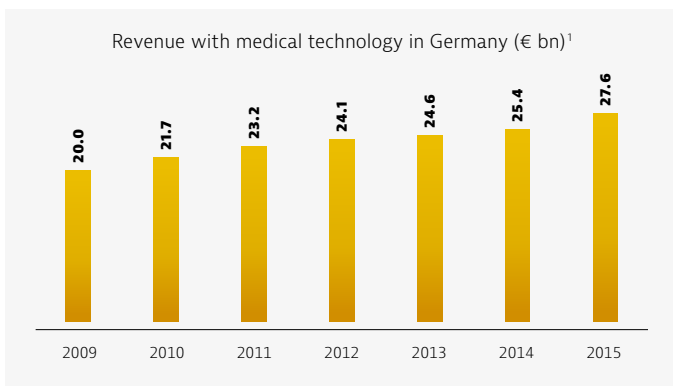
12

per cent
of Germany's gross domestic product is provided by health care – last year, the figure was €337bn²

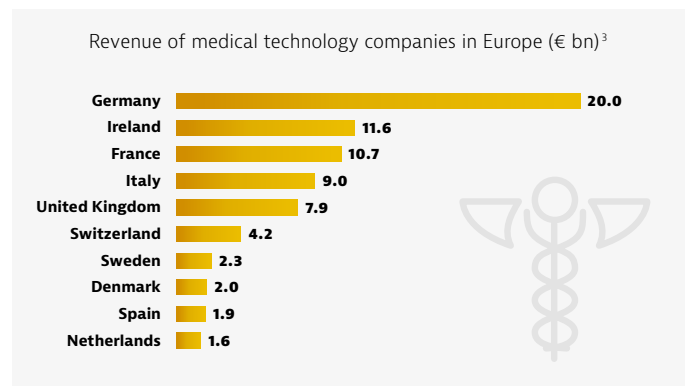
3.8

per cent
is the health care industry's annual growth rate in Germany²

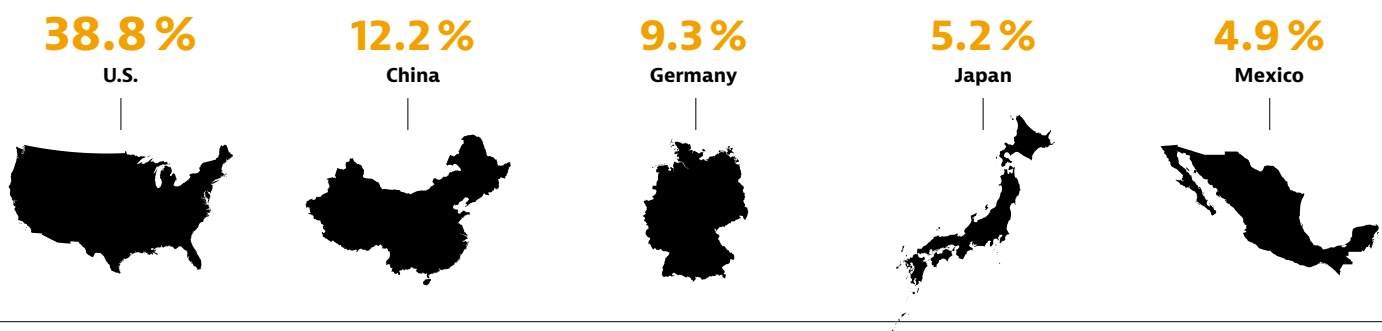
Steady growth



Germany leads the way in Europe



Share of worldwide production of medical technology³



1 Source: BVMed, 2 Source: WifOR, 3 Source: Spectaris

*Sebastian Gaiser,
Policy advisor at Johnson & Johnson*

»Come to Germany to be a world leader«

Sebastian Gaiser, responsible for German government affairs at the U.S. Medical and Pharmaceutical Corporation Johnson & Johnson, works at the Group's Berlin office and maintains contact with politicians. He encourages medium-sized companies with foreign roots to actively participate.

Mr. Gaiser, to what extent is the German medical technology market special when you compare it to other markets?

In Germany, almost all citizens are covered by health insurance and do not pay for the majority of medical services themselves. If a legally-insured patient is treated, whether as an inpatient or outpatient, the bill for the treatment ends with his health insurer. Those institutions therefore have a great influence on which treatment methods and medical products are used. It is usually difficult to get something they do not want on the market. It is therefore important to understand the interplay of health insurance companies, doctors, clinics and politics.

What does this mean for foreign medical technology companies?

They have to deal with the market at an early stage and intensively familiarize themselves with the habits. This is now more important than ever. Legislators and health insurance funds have been pushing for cost savings. You cannot cut costs by making people redundant because of public opposition. A law that has recently come into force is primarily aimed at reducing material costs. As a result of pressure from the hospitals, the profit margins for medical technology devices, which are already under pressure, are likely to continue to fall. This can have an impact on the innovative power of our industry.

That doesn't sound particularly appealing, does it?

Let's say the framework is not getting easier. But Germany has been and still is an important market because of its size and the available know-how. The plethora of high-caliber physicians, research institutes and companies offers foreign firms many opportunities to develop innovations in partnership. This is yet another feature of the German market: partnerships and alliances are more important here than in other markets. The collaboration between research and industry is especially close in the many medical technology clusters. Anyone who wants to be a world leader in medical technology must be represented here in Germany. But you have to learn to play according to the rules.

Many foreign medical technology companies start with a small team in Germany. How can they contribute to political processes?

Small and medium-sized companies are often important innovators for our industry and it makes sense for every firm in our industry to make themselves heard and take an active part in the political process. Companies can contact local politicians, for example, and inform them about what they are doing. Many politicians here are willing to acquire more detailed knowledge about medical procedures and medical technology. In addition, they have an open ear for the establishment of innovative companies. In the current situation with new laws and EU regulations, the opportunity is favorable to active participants.

Production of prosthetic limbs at the world-leading orthopedic technology manufacturer Otto Bock in Duderstadt, Lower Saxony. Powered by myoelectricity, this "art hand" can move four fingers to perform very small movements.



»The reputation of the German market is high: whoever makes it here can make it anywhere.«

Thomas Krause, MD of Amplitude Germany

→ Germany's regulatory requirements. "Much of this is secret contract research, which we do not discuss with third parties for competitive reasons," says Schneider. "This is a difference, especially to the U.S., where companies either do research alone or publicly collaborate with universities or institutes." Finally, the institute has supported a foreign company to develop a machine for the fully automated examination of blood bags for the German market, which makes the error-prone manual examination superfluous. "Until now there was no such machine on the German market," says Schneider. "It's a completely new development."

In addition to such commissioned projects, the Fraunhofer institute is developing its own innovations that med tech companies can use under license. Recently, a group of bionics experts and medical technicians have developed a tool that can be used to drill not only round but also square holes for non-slip anchors. The technology is interesting for all types of anchors, regardless of the industry, but especially for the medical sector. A company is already testing the now patented technology for use with artificial hip joints. A special drill could hollow out a patient's thigh bone in order to optimally anchor the shaft of an artificial hip joint.

The French knee and hip prosthesis manufacturer Amplitude is familiar with the German research landscape. Since the introduction of the endoprosthesis registry five years ago, for example, all details of knee and hip operations are documented, especially after what time period a prosthesis breaks and has to be replaced. To date, around 500,000 implants have been recorded and the number of participating clinics is growing. "The register is very interesting for us as a manufacturer of high-quality implants," says Thomas Krause, managing director of

Amplitude's German subsidiary. "Our distribution works on a scientific basis, and the vastness of the database of the German registry is an exception in a global comparison."

Operating in Germany

Amplitude employs 260 people worldwide and is the number two for hip and knee implants in France. Its German sales and marketing subsidiary employs nine people. The local market is one of the most important worldwide, and is vital to the company's plans for growth. "The German market is

highly competitive and the price level for our products is at the bottom in an international comparison," says Krause. The reason for this is that health insurance companies pay a fixed amount of money to hospitals for operations such as hip replacement. Thus hospitals have an incentive to buy the cheapest devices available. "Nevertheless, the reputation of the German market is high; whoever makes it here can make it anywhere," Krause adds. International customers are looking for industrial partners with concepts that are not only economical but offer the best possible solution for patients. Amplitude's customers are individual clinics and purchasing groups that bundle purchasing for several hospitals and according to great market power – this is a peculiarity of the German market. "Such a structure does not exist in the French home market," says Krause.

He also keeps an eye on the evolving regulatory framework. For instance, the GBA has announced the testing of so-called quality contracts for prostheses. In future, prostheses need no longer be judged purely on cost but also by utility: for example, does the patient need fewer painkillers after surgery and are they recovering faster than with other products? All of this could play a greater role in the assessment of prostheses in future. "I am hoping that such a swing away from the pure price competition for prostheses would confirm our business strategy with high quality standards of the products," Krause says. In any case, the GBA's advances underscore the fact that the search for optimum conditions in the German medical technology market continues. Companies are incentivized to push ahead with innovative developments.

FACTS & FIGURES

€33bn

German market volume for medical technology (2015)

Source: BVMed 2017

INVESTMENT OPPORTUNITIES

Top 5 growth areas

The world market for medical technology will grow from €370bn in 2017 to €530bn in 2022, according to the latest projections from Institut EvaluateMedTech. The German medical technology industry is likely to benefit significantly from its high export share of more than 60 per cent. One of the strongest growth areas is endoscopy, where experts predict an average growth of more than 6.5 per cent a year by 2022. The cardiology, ophthalmology, dental and in-vitro diagnostics sectors are also experiencing strong growth, at a rate of 5.5 to 6 per cent a year.



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The Reinvention of the Laboratory

In many laboratories, the opportunities brought by digitization have so far hardly been exploited. Something that the "SmartLAB" network wants to change. It is looking for foreign companies to get involved in product development.

In many laboratories, digitization and automation have not yet been introduced, meaning a lot of manual work and slow processes continue, says engineer Markus Sebeck. "This slows down the work and leads to high operating costs." In many laboratories, for each individual sample an employee must read devices and enter their results into lists or into a computer. "This often leads to mistakes," says Sebeck. "And then you have to do all the work again." There are also problems in research laboratories, where, for example, a lot of time is lost during the setup of experiments.

That is why members of the "SmartLAB" network are dealing with the question of how lab work could function more quickly and more economically in the future. Markus Sebeck is the project manager of the network, whose members are distributed throughout Germany. "We want to digitize and automate laboratories and make them more efficient this way," he explains. Twelve small and medium-sized enterprises, two large companies and six research institutes are currently involved in the network. They all pool their different expertise, including laboratory operation, instruments and other equipment, measuring and testing technology, consumables, software and IT. The network is funded by



»We want to digitize and automate laboratories and make them more efficient.«

Markus Sebeck,

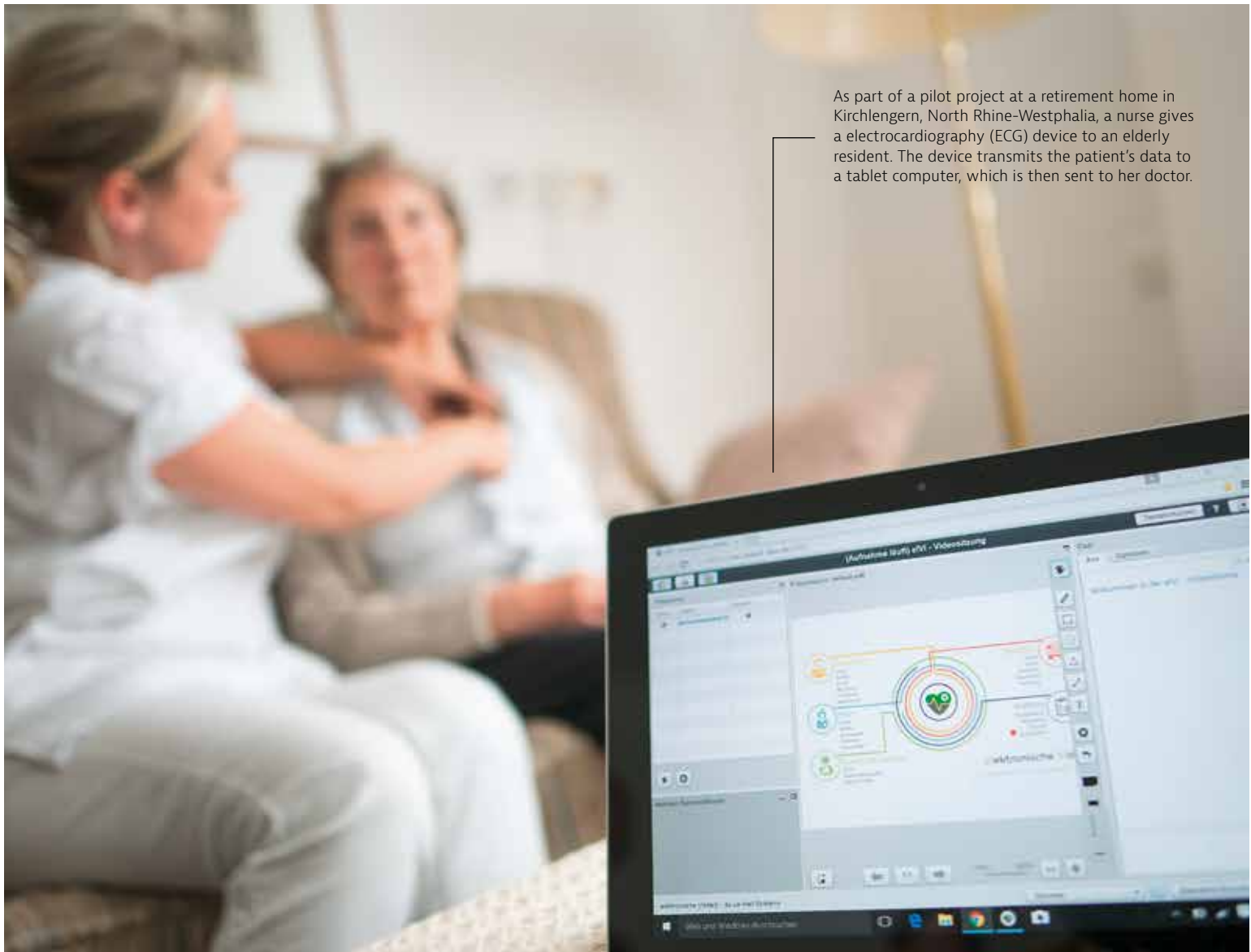
Engineer and project manager, SmartLAB

the German Federal Ministry for Economic Affairs and Energy.

The members of the network not only want to collaborate on research but also to develop new products and processes. "We need labs and scientists because they know what's going on in their labs," explains Sebeck. "But we also need technicians and software specialists to create products that can be realized from the ideas." Members work together in several smaller groups to develop new technologies and products. The companies then jointly decide who is going to bring the products to the market.

Sebeck is particularly keen to attract potential foreign partners, as they would give the network greater opportunities internationally. "We want to develop solutions that can be marketed in different countries," he says.

He does not want to reveal too much about the current product slate but in the future, for example, test results are due to be automatically be sent from the measuring devices to a central computer system. In addition, the network wants to create lab equipment that self-adapts to changing user needs and assistance tools to support the user in planning, performing and evaluating tests. "Simple, fast and efficient – this is how we imagine the laboratory of the future," he says.



As part of a pilot project at a retirement home in Kirchlengern, North Rhine-Westphalia, a nurse gives an electrocardiography (ECG) device to an elderly resident. The device transmits the patient's data to a tablet computer, which is then sent to her doctor.

Boom for IT providers

A new law will promote the digitization of the healthcare market in Germany, opening up many exciting new business opportunities for companies.

At the beginning of this year, the "e-health law" came into force in Germany and will fast-track the digitization of the country's healthcare system. The law is good news for digital health companies because it paves the way for new products, for example, in telemedicine. Health Minister Hermann Gröhe is optimistic about the industry's future. He says, "With the e-health law, we are backing up our electronic healthcare with all our strength."

Medical video consultations are just one example of new opportunities emerging for digital healthcare companies. The new law not only allows doctors to advise their patients via webcam, it also ensures the health insurance funds pay for the costs. About 70 per cent of the industry experts surveyed by the IT association Bitkom reported that this creates new market opportunities. For example, when patients live far away from a medical practice, or

are recovering after an operation, video consultations allow them to maintain communication with their doctor. Hardware and software providers as well as IT consultants hope that this will create new revenue sources for them. Other business opportunities are also being created, as a result of the new law, with the further development of the electronic health card. Since 2015, all Germans who are members of a health insurance fund have such a card. Currently, the cards only store limited data, for example, the name of the patient, their address and patient number. From next year, additional data will be stored, including details of the patient's blood type, allergies and emergency contacts. This additional data is to be recorded by doctors on their patients' cards, requiring the installation of card-reading devices and the associated software in all medical practices. Pharmacies and nursery homes

also need to have technology to read the cards. This provides business opportunities for software and hardware providers as well as IT consultants. "With the new law, we are paving the way for an electronic patient record," says minister Gröhe.

Parallel to the e-health law, an innovation fund has been set up to help start-up companies in healthcare to design innovative products. The fund will have an annual budget of €300m by 2019. "The innovation fund is a huge opportunity for start-ups," says Juliane Pohl from the German medical technology industry association BVMed. Currently, 117 projects are supported by the fund, with another 228 under consideration.



Further information:
www.tinyurl.com/e-health-law



The Shortcut wristband turns a prosthetic limb into a "phantom hand" using a micro-processor, sensors and Bluetooth.

Digital Dexterity

Contactless Control for Amputees

A fab solution from Fab Lab

In modern life, one interface dominates all others: that between hand and digital device. This makes life much harder for those who've lost a hand. Though modern prosthetics can translate nerve signals into hand motions, even they lack the fine motor skills and tactile feedback needed to use a mouse easily. Three Berlin-based design students came up with a solution. Their "Shortcut" wristband uses a microprocessor, sensors and Bluetooth to create a "phantom hand" that translates a repertoire of singled gestures into frequently used functions. For example, signal "touch forefinger and thumb" to left-click the mouse, or "snap fingers" to close an active window. The trio developed the technology in collaboration with the prosthetics firm Ottobock and Fab Lab Berlin, where they're now based. This DIY studio rents expensive, high-tech equipment to designers and serves as a forum for collaboration and training.

www.digital-prosthesis.de

Agricultural Enterprise

Ten Tons of Funghi a Day

New mushroom park in Saxony is one of the biggest in Europe

Two stories, 23 meters high, over 6,500 square meters: up to 10 metric tons of mushrooms will be coming out of this green space in Torgau, Saxony, every day before heading to supermarkets across Europe. Green Co. Ltd., a leading Korean supplier of processed mushroom products to countries across the world, has teamed up with a Chinese entrepreneur to invest €30m in this giant industrial fungi-growing enterprise – reportedly one of the biggest and most modern of its kind in Europe. Using the bottle-growing technique in 39 cultivation rooms and employing around 120 people, the joint venture Mushroom Park GmbH will initially cultivate king oyster mushrooms before expanding to include other types of fungi, including button mushrooms (champignons). Production is scheduled to begin in the spring of 2018 and annual sales are expected to reach €20m.

Auto Investment

Ford Focuses on Saarlouis

US auto manufacturer pumps €600m into German production

Ford is investing heavily in assembly operations in Saarlouis, Saarland, to produce the next generation of its legendary Focus model. The €600m drive follows improvements in cost efficiency and productivity, and will focus on state-of-the-art production, logistical support and energy supply projects. This will include two new press systems allowing the hot-stamping of high-strength boron steel to allow for more lightweight constructions, as well as five new heat and power cogeneration units to reduce CO₂ emissions by 20 per cent. Ford employs over 25,000 people in Germany – more than anywhere else in Europe. Jim Farley, president and CEO of Ford Europe, says Germany is "vital" to Ford's global business. The new Focus will be designed and engineered at Ford's technical and vehicle manufacturing center in Cologne.

www.ford.com

Travel Investment

Lufthansa's Co-Creator Pilots

"The happy journey of tomorrow"

For years airlines have typically focused on planes, noise reduction and safety, but with so much money flying into travel startups (\$3.5bn in 2016), Lufthansa decided to bring the energy of the startup ecosystem in-house by launching the "Lufthansa Innovation Hub" in 2015. The Berlin-based group of staff and outside entrepreneurs aims to identify and build new digital business models that make travel easier, more efficient and more seamless. In 2016 it launched six new prototypes in the areas of luggage, travel insurance, weekend trips, new pricing models, visa assistance and digital compensation. For example, airlinecheckins.com automatically checks travelers in for more than 100 airlines worldwide and the award-winning Mission Control provides business travelers with real-time assistance by text message.

hub.lh.com

A mega-greenhouse in Saxony-Anhalt, which will grow tomatoes and bell peppers year-round for the region.



Green Innovations

Eco-Friendly Fence Club

If you're moving to a new neighborhood, it helps to have good neighbors. A group of mainly Dutch investors have invested some €11m to build two massive greenhouses on an area as big as four soccer fields in Osterweddingen, Saxony-Anhalt, which will grow tomatoes and bell peppers year-round for mostly regional consumers. The eco-friendly facility, which launched operations this summer and will create 50 new jobs, conveniently sits next to a glass factory, from where it got its greenhouse glass panels, thereby cutting down on transport costs. It will also use the factory's waste heat and rainwater run-off, saving the growing operation up to €1m each year. There are already plans to expand the facility in 2018, and the investors are considering constructing an on-site combined heat and power station, and using waste CO₂ to make fertilizer.

Photo: © flashpics/Fotolia

EVERYTHING.
OUT OF THE ORDINARY.



Karlsruhe | Trade Fair

DeburringEXPO 10 - 12/10/2017

Trade Fair for Deburring Technology
and Precision Surfaces

expoSE 22 - 23/11/2017

European Asparagus and
Strawberry Exchange

expoDirekt 22 - 23/11/2017

Agricultural Direct Marketing Fair

LEARNTEC 30/1 - 01/2/2018

Leading trade fair for digital learning
school | university | corporate

art KARLSRUHE 22 - 25/2/2018

International Fair for Classic Modern
and Contemporary Art

IT-TRANS 6 - 8/3/2018

International Conference and Exhibition
on Intelligent Urban Transport Systems

EUNIQUE 8 - 10/6/2018

International Fair for Applied Arts & Design

LOFT 8 - 10/6/2018

The Design Shopping Centre

www.messe-karlsruhe.de/termine

Subject to alterations. | As of August 2017
Karlsruher Messe- und Kongress GmbH
Festplatz 9 | 76137 Karlsruhe | Germany



CONNECTING IDEAS.
Karlsruhe -
Messen und Kongresse

Advertising

Future Travel

Personalized Air Taxis

On-demand aviation takes off

Aviation history was made in April 2017, when a full-scale prototype of the world's first entirely electric vertical take-off and landing (VTOL) jet took its maiden flight over the Bavarian countryside. The personal air vehicle (PAV) is the achievement of 40-plus international designers and engineers based at Lilium, a Munich-based startup which aims to "enable a world where everybody can fly anywhere, anytime." With €10m from a leading European venture capital firm, the team is now working on a five-seater air taxi with a 10-meter wingspan and 36 engines to provide maneuverability and safety through layered security. With an estimated range of 300km and a top speed of 300km/h, the jet will take customers from urban landing pads to wherever they need to go, while creating no emissions and minimal noise. Lilium plans to have its first manned flight in 2019 and to offer on-demand services by 2025.

www.lilium.com



Imagining the future of the taxi in Bavaria: the noise and emission-free five-seater jets will transport passengers between urban landing pads.

Photo: Lilium GmbH

Entrepreneurship

Ingenuity Born of Compassion

Easy undies for the bedridden and disabled

The stars were in alignment for sisters Gisela-Elisabeth Winkler and Sigrid Ladig. While caring for infirm relatives, they went hunting for undergarments that were simpler to put on and take off. They asked around in the specialty shops: nothing. They looked online. Not a lot. But that didn't stop them. Sigrid, a seamstress, designed patterns for new undergarments, and now – at an age when most people are thinking about retiring rather than launching a business – the two are selling patented, award-winning underclothes that make life easier for the bedridden or disabled, and for their carers.

Renewable Energy

Energiewende On Tour!

Energy policy then & now

People around the world now know more about Germany's *Energiewende* (energy transition), and how it is transforming daily life, thanks to a traveling exhibition organized by the Federal Foreign Office that has made stops in dozens of cities across the globe. Opened in Beijing in April 2016, the multimedia exhibition – in English, Spanish, Arabic and Chinese – uses images, films and interactive displays to describe the energy transition, trace energy policy milestones since the 1970s and encourage visitors to engage in the dialogue on sustainable energy.

Industry 4.0

Tailor-made High-tech

Individualizing mass production

Six Fraunhofer Institutes have launched the "Go Beyond 4.0" lighthouse project to manufacture small batches and even single unique items under traditional mass production conditions in a way that saves resources and money. As part of the three-year, €8m project, the consortium will integrate digital printing (addition) and laser (ablation) technologies into mass production processes with demonstrators in three market-relevant fields: automotive production (Smart Door), aviation (Smart Wing) and illumination (Smart Luminaire).

www.go-beyond-four-point-zero.de



Photo: picture alliance/Jürgen Lösel/dpa-Zentralbild/ZB

Lithography takes place in the clean room at the Fraunhofer Institute for Photonic Microsystems in Dresden, a key development and production center.

Green Innovations

The Mobile Forest Parks Up

Fighting pollution with CO₂-eating moss

Air pollution is a growing problem in cities worldwide, but few of them have enough room to plant more air-purifying trees. So the Berlin-based startup Green City Solutions has devised a solution that saves space, time and, ultimately, lives. Its mobile "CityTree" is a four-meter-high wall holding 1,600 moss-filled plant boxes that provide the same environmental benefits of up to 275 urban trees – year-round and on just 3.5 sqm of ground space. While binding harmful particulate matter, nitrogen oxides and CO₂, it releases oxygen and cools the ambient air. Integrated IoT technology analyzes and visualizes data about the device and its surroundings. Optional extras include benches, advertising monitors and independent energy and water provision from integrated solar panels and tanks.

www.greencitysolutions.de/en

The founders in front of their "CityTree." From left: Peter Singer, Victor Splittger, Zhengliang Wu, Dénes Honus



Photo: © Green City Solutions

Robot Revolution

Investment in robotics has put Germany at the vanguard of industrial automation. From agriculture and construction to healthcare and security, an army of servient machines is being mobilized to streamline industrial production and meet the demands of daily life.

Mention the word “robot” and most people either think of Isaac Asimov’s androids or R2D2, the high-tech wheelie bin from Star Wars. But the public’s perception is out of step with the reality of contemporary robotics, with industrial robots playing an increasing role in streamlining production, speeding up processes and cutting costs.

The global robotics market was valued at a record \$35bn (€29.8bn) in 2015, according to the International Federation of Robotics (IFR). The IFR forecasts a compound annual growth rate (CAGR) of at least 13 per cent over the next two years (2017-19), with more than 1.4m new industrial robots expected to come online in factories around the world.

The trend toward automated production is not the only driver of growth in the industry. Most of these machines will be used in the manufacture of other machines, such as cars, dishwashers and computers. So as people buy more new gadgets, the market for the industrial robots to build them will continue to grow. Loup Ventures, an American high-tech venture capital company, predicts the market for industrial robots will grow by as much as 150 per cent over the next eight years. In addition, sales of software and services could increase the value of the robotics market threefold.

Germany’s expertise

The German robotics and automation (R&A) industry has long been at the vanguard of robotics production, quadrupling its turnover since the mid-1990s and now employing more than 50,000 workers. Germany has around 300 industrial robots per 10,000 employees, far higher than the global average of 69 robots per 10,000 employees. Indeed, Germany has the highest proportion of industri-

MARKET INSIGHT

A growing workforce of automatons

Robots at your service

In addition to large and usually static industrial robots, service robots are becoming increasingly common. Industry experts predict that their sales could draw level with those of industrial robots by the early 2020s. Commercial applications include warehouse labor, agriculture, construction, security and public safety, and healthcare. The market for consumer robots to perform household chores such as cleaning or mowing is also growing rapidly as the Internet of Things (IoT) ushers in a new era of interconnectivity. The Robotics Business Review predicts global household robot sales will reach \$33bn (€28bn) by 2025.

iREX 2017



A robot constructed by German company Iigus attended a soccer game at the International Robot exhibition (iREX) in Tokyo

iREX is the world’s largest robot trade fair, bringing together leading manufacturers, suppliers and service providers from all over the world. This year iREX will take place in Tokyo from November 29 to December 2. Germany Trade & Invest (GTAI) will have a stand at the fair and will also host a seminar entitled “Doing business in Germany” on the opening day.

al robots in Europe, and the fourth highest in the world.

Germany’s automotive sector is the leading client for industrial robotics, followed by the electrical and electronics industries. Engineering, plastics and chemicals and the food industries are also major buyers of R&A applications. Although Germany already has a comparatively high number of robots, annual sales are still growing. In 2016, Germany’s Mechanical Engineering Industry Association (VDMA) says the country’s R&A industry generated a record turnover of €12.8bn, with an export share of 57 per cent. Sales to Europe reached 30 per cent of all German exports in this sector, while China accounted for 10 per cent and North America nine per cent. Germany was second only to Japan, with a 14.2 per cent share of the global market worth \$639.7m (€544.6bn).

The VDMA divides the robotics sector as a whole into three: robotics itself, integrated assembly solutions – new hardware and components for processes, such as forming and testing – and machine vision (MV) technologies for applications, including data collection, component identification and tracking, and quality control. Germany is particularly renowned for its machine vision technology. Overall sales grew by nine per cent in 2016, with domestic sales growing by three per cent and exports by 14 per cent. The VDMA forecasts a ten per cent increase in sales this year.

Another major growth sector is collaborative robots, which are designed to work safely alongside people in factories. These robots make it possible to automate the repetitive and physically demanding tasks normally carried out by humans. The German government’s high-tech Industry 4.0 strategy to promote the digitization of the supply chain gives the country’s R&A sector a significant

edge in a rapidly growing market. The federal government has earmarked more than €2.6bn for investment over the next three years. In 2016, collaborative robots accounted for just 3 per cent of all industrial robots sold worldwide, but Loup Ventures predicts this proportion will rise to 34 per cent by 2025.

Investment landscape

Industry 4.0 is just one of the factors providing a fertile environment for R&A companies to flourish. Other key factors that help make Germany Europe's robotics hub include its political and industrial stability, its proximity to major markets, supplier industries and industry clusters, an excellent infrastructure, an educated and competitive workforce and

an unparalleled R&D landscape with close ties to business, industry and politics. The country also offers significant opportunities for international investors. The Chinese in particular have been quick to take advantage of it with a high-profile acquisition that could bring major dividends to both sides.

Kuka is Germany's biggest maker of industrial robots and a global leader in its own right. Although it may not be a household name, its signature orange livery is a familiar sight in factories around the world. The Chinese home appliance manufacturer Midea bought it for €4.5bn in 2016, and the synergies between the two companies are compelling. "Midea is not doing any robotics or automation, so Kuka is automation for Midea," Kuka

CEO Till Reuter says. "And they are very well connected to the consumer industry. So together we want to do consumer robotics."

The interface between industrial, commercial and consumer robotics is developing rapidly as new markets emerge and robots start to migrate from the factory floor to our streets, offices and homes. The future of robotics is already here, and German companies are leading the way in making it happen.



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Further information:

www.tinyurl.com/germany-robotics

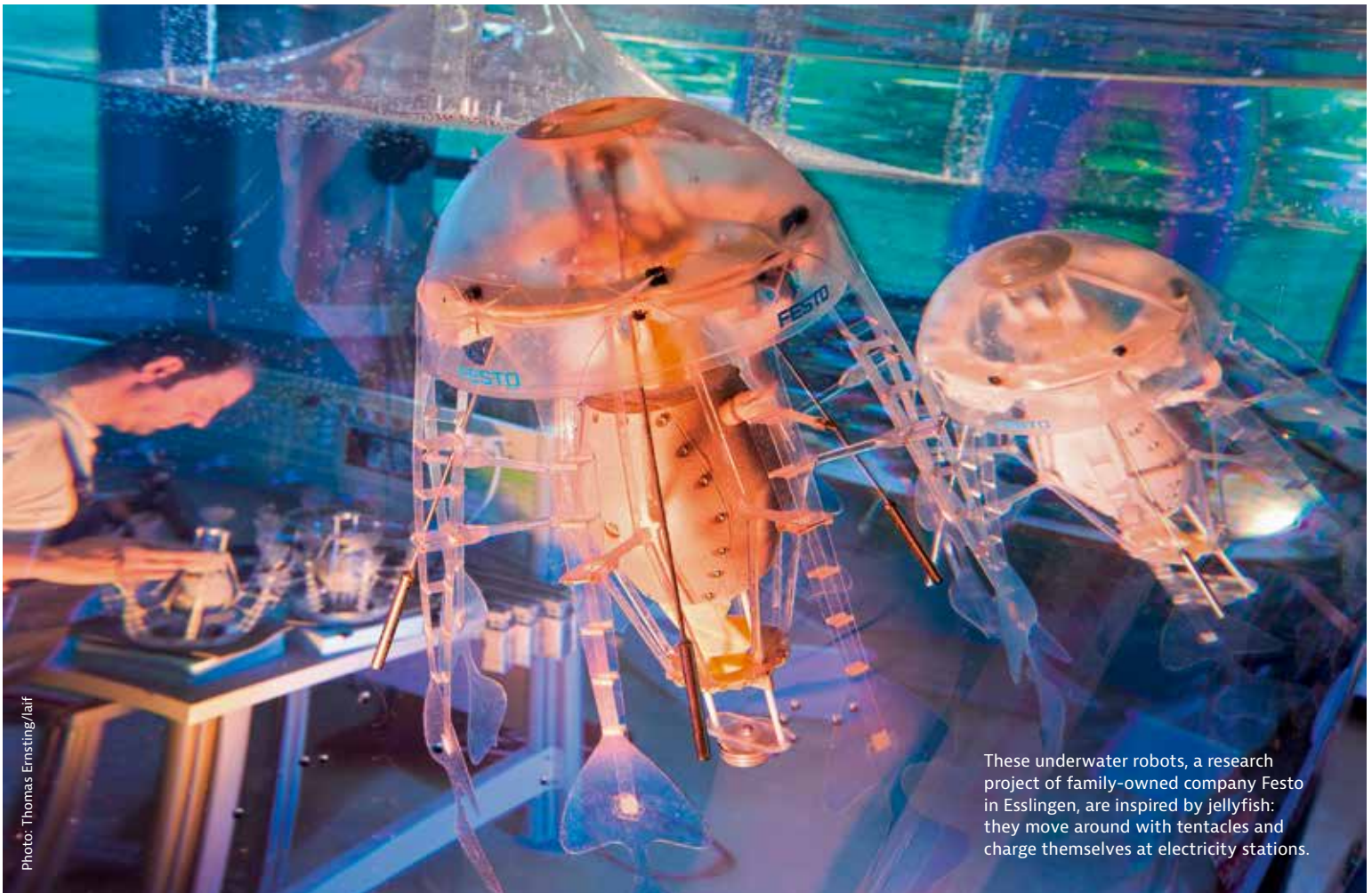


Photo: Thomas Ernsting/aif

These underwater robots, a research project of family-owned company Festo in Esslingen, are inspired by jellyfish: they move around with tentacles and charge themselves at electricity stations.

The Power of Tiny

Germany is strengthening its position as a leading global micro and nanoelectronics hub and partnering with other EU states to ensure Europe remains a viable player in this fast-growing sector.

Research at the recently-founded Research Fab Microelectronics Germany, where 13 German research institutes work together on mold-breaking new developments in micro and nanoelectronics.



With international competition heating up in the global semiconductor market – which represents a broad range of technologies fundamental to almost all industrial applications and plays a pivotal role in digitization, Industry 4.0 and the Internet of Things (IoT) – European industry and government leaders in Berlin and Brussels are taking decisive steps to secure, fortify and further develop the sector in the region.

In Germany, microelectronics are transforming the country's traditional machinery and automobile manufacturing sectors, according to Christoph Kutter, director of the Fraunhofer Research Institution for Microsystems and Solid State Technologies in Munich. German industry is particularly strong in building machines and plants for production and automation. "Autonomous driving will be enabled by micro and nano-electronics, sensors, data handling, control logic and security," he points out. Indeed, electronics systems already represent some 90 per cent of automotive innovations.

Global investment

To ensure that Germany continues to play a leading role, the Federal Ministry for Economic Affairs and Energy (BMWi) last year announced a €1bn investment program aimed at promoting investment in the field from 2017 to 2020. The private sector has agreed to invest more than €3bn. The BMWi will contribute €850m to the project, with additional support from other EU member states.

The program was made possible by the European Commission's aid regulations for Important Projects of Common European Interest (IPCEIs). Subsidies available to the microelectronics sector in Asia and the U.S. have helped to give them the edge, says Kutter. The IPCEI initiative will help level the playing field by spurring investment in semiconductor facilities in Europe and making Germany even more attractive to international players. Indeed, 17 large and medium-sized semi-

MARKET SECTORS

Key industrial applications for micro and nanoelectronics



Auto industry

Drives and sensor systems are enabling sustainable and intelligent mobility



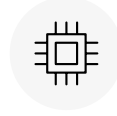
Medicine

Diagnostic systems promote healthier living



Energy

Grid control systems are ensuring a sustainable energy supply



Industry 4.0

Networked industrial production and robotics are transforming global manufacturing

conductor manufacturers, including international companies like Abu Dhabi-owned GlobalFoundries and Belgium's X-Fab, as well as local players Infineon and Bosch (both world-leading semiconductor sensor and actuator manufacturers), are planning to invest more than €3bn combined in Germany. GlobalFoundries is investing €1bn in the expansion of its production facility in Dresden, while Bosch is spending €1bn for a new fabrication plant (fab) there and Infineon is planning major expansion to plants in Regensburg, Dresden and Warstein.

GlobalFoundries is looking to increase production capacity at its Fab 1 facility in Dresden by 40 per cent by 2020 to meet demand for the IoT, smartphone processors and automotive electronics. The fab, which employs some 3,700 people, already represents one of the biggest international investments in Europe – to date a total of more than \$9bn (€7.6bn). "The IPCEI on microelectronics will help to put the European network of industrial players, universities and R&D organizations back in the driver's seat," says Rath. "Our planned expansion of the Dresden site to a 'one million wafer starts per year' fab fits well into this development."

For Brigitte Zypries, Germany's Minister for Economic Affairs and Energy, the country's microelectronics sector is vital. "Strengthening semiconductor expertise in Germany, and thus in Europe, is an investment in a key technology of the future, and thus a very important step toward preserving and enhancing competitiveness, also of Germany as an industrial location."

Research and innovation

It should be said that Germany is already home to more than 40 semiconductor fabs run by diverse local and international players, among them Dutch group NXP Semiconductors, US company Texas Instruments and Osram/Siemens. Earlier this year IBM opened a new global HQ for its Watson IoT business in Munich to accelerate innovation in the IoT via collaboration with partners.

IoT applications are of great strategic importance for semiconductor manufacturers. Bosch is building its new wafer fab in Dresden (a city that boasts a unique microelectronics cluster) in order to satisfy demand and expects to employ some 700 people at the new plant when it opens in 2021. The Saxon city is developing a vibrant IoT ecosystem following its selection by the BMWi as a "Smart Systems Hub." The government's digital hub initiative aims to develop an internationally-recognized innovation center for industry-wide digitization.

The Federal Ministry of Education and Research is separately funding research in micro and nanoelectronics with €400m. The Research Fab Microelectronics Germany initiative, which launched in April, will help provide 13 participating non-university research facilities with state-of-the-art equipment and systems. In a second step, €50m will be earmarked for universities doing research in the field.



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German AI is A1

With ever-increasing amounts of data to make sense of, AI will be the companion technology of the future. And with IBM's \$200m (€174.5m) investment in the Watson IoT center earlier this year, Munich is shaping up to be a global hub for machine learning.

A small bakery in Berlin's Kreuzberg district has been noting days where wastage of croissants is significantly higher than others. The owner runs his datasets through the IBM Watson IoT's artificial intelligence program and finds the wastages directly correlate to the weather. He can therefore optimize operating efficiency according to the weather forecast and his profitability jumps.

Artificial intelligence (AI) is turning out to be an extremely useful tool across all industries – and Germany is at the forefront of global research and development activity. Large institutional investors run AI programs to make trading decisions at lightning speed. Industrial machines imbued with AI can learn customer quirks, order their own maintenance and even interpret speech across languages. More applications of “machine learning” are found daily, from crunching statistical streams to optimizing city traffic flow, to a small bot that ensures an accurate Google search for the wine buff.

In February IBM opened a \$200m research center in Munich, the Watson IoT center. It represents the company's largest investment in Europe in more than 20 years. And today, 6,000 global clients are tapping Watson IoT services. Watson's mission is to gather ever-larger datasets and look for new correlations and explanations, using an algorithm that learns when it's exposed to new data instead of being programmed by an individual. The process enables the machine to engage in a dialogue with people, learn how to improve its answers and make sense of the increasingly huge amounts of data generated in a connected world.

“There are more than 9bn connected devices operating globally, generating 2.5 quintillion bytes of new data daily,” says Niklas



IBM's Highlight Towers in Munich, Bavaria,, the IT giant's global headquarters for the Internet of Things. The Watson IoT center opened in February 2017 and cost \$200m.

Waser, Vice-President of Watson IoT Europe. “However, 90 per cent of that data is never used. The market for making sense of these devices is expected to reach €1.45tn by 2020.”

Germany seemed the logical choice for the investment - the perfect platform for research and development across a number of sectors, Industry 4.0 in particular. “Germany has a number of world-renowned institutes such as DFKI, Fraunhofer Institute and Max Planck Institute carrying out research in AI,” says Ross Turner, head of engineering at Visual Meta, a Berlin start-up which uses AI to customize a shopping portal called *Ladenzeile*. “In addition, the general education level of computer scientists in Germany is very high, which means that the majority of them have a very good understanding of AI technology and concepts. This has helped to build up AI know-how in the German economy on a broad scale.”

The future of AI

It is still early days for AI, but there are so many applications for it and directions it could go in. “Increased computing power and wider availability of data have seen techniques such as deep learning come to the fore,” says Turner. “This has fueled some state-of-the-art results in fields such as image recognition and natural language processing. There is a lot of growth potential in areas such as workplace automation, conversational interfaces, smart homes and driverless cars.”

In terms of accomplishing specific tasks, AI can be considered mass market, but as Turner points out, the point at which we will be able to interact with robots that can exhibit self-awareness or communicate effortlessly in natural language is still some way off.”



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Fastest Radish in the West

The launch of Amazon Fresh in Germany is a shot in the arm for German online grocers. Established providers are still growing despite intensified competition, creating opportunity for foreign investors, traders, logisticians and IT specialists.

During the riots around the G20 summit in Hamburg in July, one photo lit up social media: a man surrounded by armed police holding up a sign which reads, "I live here and am just popping out to Edeka. Thank you." The retailer Edeka was quick to respond, posting an edited version of the photo on Facebook, which shows a second sign in the crowd: "Stay home. We'll bring you something. No problem." It was a gift of a marketing opportunity as online grocers strive to raise awareness of their services: many German consumers have still never ordered their groceries online.

But now the German online grocery trade is gaining momentum and growing at a significantly faster pace than bricks and mortar trading. The online market for fast moving consumer goods (FMCG) grew by a whopping 11 per cent in Germany in 2016, according to the market research firm Nielsen. The offline market, on the other hand, grew by less than one per cent during the same period.

Growth spurt in e-groceries

Industry observers see great potential in the online groceries market in Germany. The growth spurt in the sector opens up opportunities for service partners from other industries, such as logistics companies or IT providers. Flexible delivery times, fast delivery, omni-channel strategies including Click & Collect options and ease of operations are all factors that are motivating more and more consumers to buy their food online. But it's not just domestic supermarkets that can

ONLINE GROCERIES IN GERMANY

Amazon Fresh will stiffen competition



Amazon Fresh was launched in early May in Berlin and Potsdam, with a selection of around 85,000 products and a pledge to deliver the same day. The U.S. company is expanding its online supermarket to Hamburg next and has set its sights on rolling out across Germany.

The market: facts & figures

€177bn

Total annual turnover from FMCG supermarket goods via conventional retail in Germany in 2016

€897m

Total annual turnover from FMCG supermarket goods via e-tailers in Germany in 2016

€20bn

Forecast sales of online food trade in Germany in 2020

benefit from this growing trend – there are opportunities for foreign grocers in Germany too, if they dare to enter the marketplace.

The entry of online giant Amazon into food delivery is likely to be a catalyst for further growth in the e-grocery market. Amazon Fresh was launched in Germany in May; and while it is only currently available in Berlin, Hamburg and Potsdam, it has made its ambition clear: "We want to make Amazon Fresh available to customers in other areas of Germany," says a spokeswoman. Amazon Fresh is capable of offering a wide variety of products (85,000) and same day delivery.

German food retailers expect Amazon Fresh to quickly establish itself in the food market, a recent report from the trade journal *Lebensmittel Zeitung* shows. By the year 2021 the online giant could increase sales of its food delivery service in Germany to approximately €120m. The repercussions will be felt by competitors like Kaufland, Bringmeister and Rewe, one of the first supermarket chains to establish itself in the e-tail market and the number one brand in this space today. Rewe's delivery service is currently available in 75 German cities. In the past year, Rewe's online turnover increased by more than 60 per cent to over €100m and by 2020 the company aims to increase it to €800m, despite the new competition.



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Germany's Energy "Moon Landing"

Over 70 partners in northeastern Germany have teamed up on WindNODE, a game-changing project to develop a smart model for steering the generation, use and storage of large amounts of fluctuating renewable energy that can be adapted for wider use.

When Markus Graebig was an engineering student, his professors told him that it was physically impossible to run a stable electricity grid operation with more than 25 per cent of the mix coming from renewables. "And here we are at one-third for Germany and 50 per cent for our region," says Graebig, director of WindNODE. Today, thanks to Germany's *Energiewende*, generating electricity from renewables is not a huge challenge anymore: between 2010 and 2016, the share of renewables in its gross electricity production skyrocketed from 17 to 32 per cent. Experts say this trend will continue for years to come, as the country has entered phase two of the energy transition. Now the big question is, as the share of electricity generated by wind and PV installations rises, how can intermittent renewables be integrated into the overall system while keeping the grid stable and ensuring security of supply?

In 2016, the Federal Ministry for Economic Affairs and Energy (BMWi) chose five regional "showcases" to tackle this challenge from multiple angles as part of its €230m SINTEG funding program. For northeastern Germany, WindNODE was chosen to find a way to make the demand side more responsible for the system stability where its electricity is mainly derived from renewables. If the

SMART ENERGY LOW-DOWN

Energiewende Goals

- Phase out nuclear by **2022**
-
- Boost share of renewables:
40–45% by 2025, 80% by 2050
-
- Reduce greenhouse gases:
40% by 2020, 80–95% by 2050
-
- Improve electricity efficiency:
+50% by 2050
-
- Extend grid to connect
renewable systems with industry
in southern Germany

WindNODE: Key Figures

€70m

Funding

>48%

Power from re-
newable resources

16m

Power
consumers

6

Participating
states

45

Project partners

(receiving
SINTEG funding)

30

Associated partners

(not receiving
SINTEG funding)

model shows that the *Energiewende* can work in a single region, it can be adapted for the national level and beyond.

Flexibility, integration, dissemination

The consortium of 70, which is supported by six federal states, aims to model an "Internet of Energy" in which all system players – power generators, grid operators, ICT specialists, aggregators and prosumers – communicate with each other in almost real-time to efficiently generate, use and store renewable energy. The key goals are to identify and activate opportunities for flexible demand to allow plants and small producers to swiftly react to fluctuations in generation while developing the business models and control methods to exploit them, to establish intelligent networking on three levels (smart grids, ICT structures, markets/regulations) to allow as many players as possible to constantly exchange information and to encourage the flexible use and storage of energy when it is more plentiful and therefore cheaper using sector-coupling techniques (e.g. power-to-heat, power-to-cold and electromobility).

Various partners are working on different aspects of the project, making the region a "real-world laboratory for intelligent energy," says Graebig. For example, the retail giants

Energy storage house in the village of Feldheim, 60km outside Berlin – a model of energy-efficiency. The giant battery stores up to 10 megawatts of electricity, generated from more than 40 wind turbines.



Photo: Paul Langrock/Zenit/haif

Lidl and Kaufland are testing whether their cooling systems can generate reserves when power is plentiful in pilot stores. 50Hertz, the transmission system operator coordinating the project, and distribution system operators are identifying flexibility options at the local level (e.g. supermarkets, industrial plants) to avoid bottlenecks on certain power lines. Meanwhile, Siemens is shifting production times at its massive operations in Berlin to when solar and wind energy is plentiful. And in early June, the Swedish power giant Vattenfall announced it will invest almost €100m to build Germany's largest power-to-heat plant in Berlin as part of its efforts to phase out coal there by 2030.

The projects will be organized into nine "demonstrators," where innovative, tangible solutions at all stages of the interconnected energy system will be presented to interested parties and potential investors and combined to form one joint model. In addition, there will be 20 to 30 locations where experts and the public will be able to view the concrete results. Although these will only become avail-

able in late 2017, early cross-sector groups have already borne fruit, claims Graebig, while the technical potential for flexibility in industry has proven "even bigger than we had estimated."

Showcase, blueprint, export

Although companies must be based in Germany to participate as a project partner, many of them are global players, subsidiaries and foreign "associated partners" (e.g. the Polish power company Tauron). "There won't be a 'one-size-fits-all' energy system design providing an exact, made-to-order blueprint for another region," Graebig points out. "But we are inviting stakeholders from all over the world to look at these model solutions in a real-world context and then to engage in a dialogue on future solutions, best practices and potential collaborations." Thus all parties can benefit from the project's transparency.

Already, foreign companies are seeing the value of WindNODE. For example, OPAL-RT Technologies, a world leader for

simulation-based test and prototyping systems for power grids, will be opening an office in Germany in October to be closer to the action. "WindNODE is a comprehensive effort to overcome the technological, infrastructural and commercial challenges of the *Energiewende*," says Ravi Venugopal, director of the Montreal-based company's US technical services. "We see it as a rich source of information and innovation to help shape our product strategy for the grid of the future."

Graebig shares this enthusiasm. "Some have compared the *Energiewende* to the American moon landing in terms of engineering complexity," he says. "We want international stakeholders to feel the same level of excitement about exploring the opportunities – and beauty – of this game-changing project."



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Germany has a historical reputation as the world's pharmacy

Order number: 20858



Chemical Industry

The industry employs a highly-trained workforce of some 330,000 people

Order number: 20915



Chemical Parks

A network of highly-integrated chemical production sites

Order number: 20909

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on the basis of a decision
by the German Bundestag

Japan and Germany in “Wa” (Harmony)

Iwami Asakawa, GTAI's representative in Japan, uses his extensive knowledge and experience of Japanese business practices to understand what potential investors think, plan and desire, in order to help harmonize business interests between the two nations.

INTERVIEW

Insight Japan



Mr Asakawa has been GTAI's “man in Japan” since 2005. Previously, he held a senior role in the overseas operations team of an electronics giant. GTAI Japan is located at the Tokyo offices of the AHK.

Mr. Asakawa, the Japan Germany Industry Forum (JGIF) in Tokyo is an annual event at which Japanese investors can discover business opportunities in Germany. Will a particular industry be the focus this year?

IWAMI ASAKAWA: Since its start in 2005, we have selected JGIF topics that are of great interest to both countries: electronics, communications, robotics and medical devices are all regular topics. This year's 13th JGIF will focus on energy. We will look at the respective energy markets, especially focusing on the post-liberalization of the energy retail markets.

Who is the event targeted at and what can participants expect to find?

ASAKAWA: JGIF is targeted primarily at Japanese investors, relevant industry associations and multipliers. They are presented with market data and industry trends from Germany. Importantly, they can also network with GTAI experts and with representatives of German federal states to get a sense of what working with Germany will be like. Every JGIF is organized and hosted by GTAI but the federal states support it and take part in an event called *Mini Messe*.

Recently JGIF has been getting strong support from the German Chamber of Commerce and Industry in Japan (AHK), along with other significant parties like the German Embassy, JETRO, Keidanren, NEDO etc. This year I hope to see big players from the field of energy.

Which industries are attracting a lot of attention from investors at the moment?

ASAKAWA: In general, I would say that cars and electronics are always target sectors. Also healthcare is very important, as our two countries both have to contend with ageing societies. Furthermore, we are seeing a spike of interest in energy storage: car batteries, industry and home usage. Japan has considerable expertise in battery products as well as in raw materials. New ICT-driven businesses like AI, robotics and e-commerce have started to show concrete movement too.

What are the advantages of Germany as a location?

ASAKAWA: A strong market, high productivity, quality workers, robust infrastructure, high living standards and the Made in Germany brand.

How can you help Japanese companies invest in Germany? And how do you work with the AHK?

ASAKAWA: I identify potential Japanese investors, inform them about the market conditions and convince them to take the next step, with help from our experts in Berlin. Of course I will also tell them if I think a project won't be suitable. Working with AHK-J, we are constantly building up a detailed picture of the economic landscapes

in Japan and Germany and where good opportunities exist. There is a lot of knowledge exchange regarding the status of potential investors, selection of speakers and topics, and many other aspects.

What was your biggest success last year?

ASAKAWA: I could name a few prominent successes – one of Japan's most successful apparel retailers or a high-profile chemical company, for example – but as I said, we treat all our clients confidentially.

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Young Europeans

The strength of Germany's economy is reliant on the EU and the single European market. Companies therefore need to work harder to ensure that the EU continues to develop in the right direction, says the chairman of an association of young entrepreneurs.

When member states of the European Union (EU) cooperate and collaborate, it has a positive effect on the European economy as a whole. Ergo, increasing European integration leads to further economic growth and new business opportunities. Companies should be actively encouraging deeper ties with Europe, says Alexander Kulitz, chairman of *Wirtschaftsjunioren Deutschland*.

“We have to take responsibility and make our contribution to making the European Union and the single market even more successful in the future,” says Kulitz. From a German perspective, this is vital for growth: in recent years, the country has flourished as a direct result of free trade and free movement of capital within the EU. Exports from Germany are at record levels. In addition, many foreign companies have invested in Germany. “Today it would be hard to imagine trade and capital flows between EU countries being regulated,” he says.

INVESTMENT PROSPECTS

The Business of Youth

The “*Wirtschaftsjunioren Deutschland*” can claim more than 10,000 entrepreneurs and managers under 40 amongst its members. They see themselves as representing the interests of the younger generation in Germany. One of their key objectives is to strengthen economic growth in Germany and across the whole of Europe and to boost healthy competition.



Pro-EU demonstrators gather in Berlin's Gendarmenmarkt square in March. The “Pulse of Europe” movement sprung up in 2016 as a response to the Brexit result and the election of Donald Trump.

Over the next few years, Kulitz's organization wants to focus on inspiring young people to be more consciously pro-Europe. “Many young people and young adults today take the benefits of European integration for granted,” says Kulitz. “This is why they are mainly concerned with disadvantages or show a certain degree of neglect with regard to the EU.” He suggests that companies and trade associations have several ways to deal with this problem. For example, companies could help young employees to work abroad for a period of time. “Many university students already go abroad in the context of European programs such as Erasmus. This should also be possible for trainees,” he says.

The association is also working toward eliminating bureaucratic obstacles for young entrepreneurs. “If the EU succeeds in adapting its regulation to the needs of small businesses, this would make the single market

even more attractive,” claims Kulitz. For this reason, the association is calling for a so-called “SME test” for all new EU regulations, to determine whether a new ruling fits the needs of small and medium-sized enterprises.

The “*Wirtschaftsjunioren*” regularly exchanges information on pro-EU initiatives with similar organizations within the trading bloc – for example, the “Yes for Europe” congress, held regularly in Brussels. Representatives of ten young entrepreneurs' associations from all over Europe meet there to discuss current issues. Kulitz and his fellow campaigners are seeking to further expand their ties with other EU countries and have recently signed a close partnership with the Dutch Association of Young Entrepreneurs.



Further information:
en.wjd.de

Small is Beautiful

The strength, versatility and innovative power of small and medium-sized companies in Germany makes this market segment interesting for foreign investors, says Martin Wansleben, CEO of the Association of German Chambers of Commerce and Industry.

INTERVIEW

CEO of DIHK



The Association of German Chambers of Commerce and Industry (DIHK) is the central organization for 79 chambers (CCIs). All German companies (with a few exceptions) are required to join a chamber.

Mr. Wansleben, many companies of world renown are based in Germany. But the vast majority of Germany's 2.5m companies are SMEs. Are these companies therefore the backbone of the German economy?

MARTIN WANSLEBEN: I don't want to explicitly highlight one segment. It is our unique mix of companies that provides the strong backbone of our economy. There are corporations of world rank and there are many successful small businesses. In addition there is a broadly established and internationally successful group of medium-sized companies, many of which are run by the families who own them. Many SMEs are involved in networks with research and science. They partner with large companies and can often be world market leaders in their sector.

Is there a reason why so many medium-sized companies in Germany are strong?

WANSLEBEN: Family-run businesses tend to be oriented towards long-term, sustainable growth. They're not just thinking about the next quarter, but to the next generation. This is the foundation of a culture of self-responsibility and reliability. Added to this is the fact that German SMEs feel closely linked to their core region, but have always been internationally committed. This provides a stabilizing factor – problems in one market can be offset by increases elsewhere.

In which sectors are German SMEs particularly vigorous?

WANSLEBEN: Many of the 1,300 world market leaders from the SME sector are manufacturing companies. However, there are many service providers that work with larger medium-sized companies – for example in aiding digitization. There are also many successful retailers, caterers, tradesmen and other service providers. Our economy is founded on a broad, cross-industry base made up of medium-sized businesses.

We often hear it said that SMEs are Germany's innovation and technology motor. Is this true?

WANSLEBEN: With their "Made in Germany" products, many SMEs are our "hidden champions" and represent Germany internationally as a location. They make a significant contribution to innovation performance. Recent figures show that German companies invest €62bn a year in their own research and development – more than ever before.

How open are German SMEs to foreign investment and joint ventures with overseas companies?

WANSLEBEN: It depends on the kind of cooperation. Often it is more than purely financial. Does a joint venture complement the existing product portfolio? Can the company open up

new markets or customer groups? Are additional investments made in new technologies? Ultimately, it is like many partnerships: the benefits must be a priority for both parties.

Many owners of German SMEs are due to retire in the next few years, which will result in a generational fluctuation. Is this an opportunity for foreign investors?

WANSLEBEN: Small companies in particular tend to look for their successors in their own family. However, this is becoming increasingly difficult as a self-assured young generation is taking its own path. Another factor perhaps is that fewer young people are seeing opportunities for entrepreneurial independence within the family business. In the future, German SMEs will therefore have to be more open to succession regulations, in which investors from abroad are involved.



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