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SAXONY-ANHALT –
THE STATE FOR FUTURE TECHNOLOGIES





SACHSEN-ANHALT
Investment and Marketing
Corporation

HERE BUSINESS MEETS SCIENCE.

Team Bilberry, Mateusz Krain (l.) and Krzysztof Dobrmin
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IT'S A COMMON CLICHÉ: SAXONY-ANHALT AND INNOVATIONS? NOT A GOOD MATCH.

We prove evidence to the contrary and show that something impressive is emerging in Saxony-Anhalt. Because HERE innovations take their origin. HERE researchers discover groundbreaking innovations. And HERE entrepreneurs develop their products to market maturity.

www.center-of-excellence-saxony-anhalt.com



CENTER OF
EXCELLENCE
SAXONY-ANHALT

HERE we chart our course.

Dear readers,

The German economy is undergoing a period of upheaval. The automotive industry is investing billions in developing new powertrain technologies and mobility services, while manufacturing industries and mechanical engineering are becoming greener and more sustainable. Following the phase-out of nuclear power, by 2038 brown coal will no longer be used for electricity generation and priority is being given to developing renewable energy sources. And importantly, digitalization is making its way into almost all areas of our lives.

And as if all of this weren't exciting enough, 2020 will go down in history as the year of the coronavirus pandemic. The virus is not only putting businesses and jobs at risk, it is also speeding up some development processes. People are working, shopping, communicating and learning online more than ever before. Although the pandemic is not yet over, it is worth taking a look into the future. What will happen to the economy in the years to come? Saxony-Anhalt is intending to make the most of the opportunities that result from all of the upheaval and disruption.

In recent years, Saxony-Anhalt has become a highly attractive location for national and international investors with a focus on the technologies of the future. The US company Farasis is building a factory in Bitterfeld-Wolfen for the production of electric car batteries. At Leuna, a center of the chemical industry, the Finnish UPM Group has recently given the go-ahead for the construction of the first biorefinery of its kind which in future will produce biochemicals from sustainably harvested hardwood. In addition, a model region for hydrogen will be established over the next few years in the south of Saxony-Anhalt with prominent partners such as Linde and Total.

You can find out more about these and other exciting developments in Saxony-Anhalt in this magazine. You will discover that Saxony-Anhalt is far from being just an outsourcing location. It is becoming a state for future technologies which is a rewarding place to live, to work and, of course, to invest.

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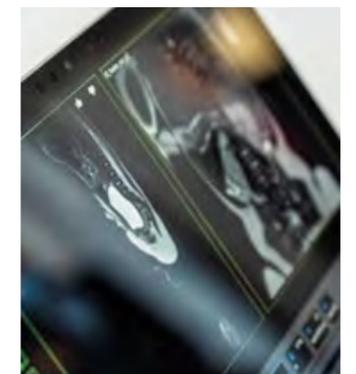
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“In Saxony-Anhalt we are investing in the technologies of the future.”

With the coronavirus pandemic, digitalization and the transformation of the automotive industry, the economy is undergoing a period of upheaval. In this interview, Professor Dr Armin Willingmann, the Minister for Economy, Science and Digitalisation, emphasizes that this presents major opportunities for Saxony-Anhalt. By creating close links between business and science and by making targeted investments, Saxony-Anhalt intends to become the state for future technologies.

Despite the coronavirus pandemic, Saxony-Anhalt is seeing an astounding amount of corporate investment. Why is that?

ARMIN WILLINGMANN: Well, it doesn't come as a surprise! Over recent years, Saxony-Anhalt has become a highly attractive investment location. During this legislative period, we have brought science and business closer together and made targeted investments in both areas. Now national and international companies are coming here because they can find the highly qualified and talented employees they need from our first-class universities at a time when there is a serious shortage of skilled staff. They can also run their development projects in cooperation with our research institutes. In addition, surveys have shown that the residents of Saxony-Anhalt see industry in a positive light and are very open to large new industrial developments.

But the economy is undergoing a period of upheaval, particularly with regard to the automotive industry, digitalization and the energy transition.

ARMIN WILLINGMANN: We are undoubtedly facing significant challenges, but all of this also brings major

opportunities for Saxony-Anhalt. For example, we have built world-class expertise in the field of automotive engineering. Leveraging on this, we would like to become the leading federal state for state-of-the-art technologies, and we are already making good progress in this direction. The Chinese-American company Farasis is building a factory for electric car batteries in Bitterfeld-Wolfen at a cost of around 600 million euros. Not far away, the FEV Group has just opened the world's largest independent development and test center for high-voltage battery systems. Porsche and Schuler AG are constructing an ultra-modern bodywork plant in Halle, and the Japanese HORIBA Group is building its European test center for fuel cells in Magdeburg. Centers of Excellence are springing up all over Saxony-Anhalt which are attractive to investors but also to employees. This is where added value and high-quality jobs will be created in the years to come.

Is it possible to put a figure on the success of this process?

ARMIN WILLINGMANN: We can get an idea of the level of growth by looking at corporate investment. In the previous legislative period the volume of investment was around 3.1 billion euros. In the current period, which lasts



until mid-2021, we will probably see investments of more than 4 billion euros.

Why are you so optimistic that the next wave of company moves to the region will be successful?

ARMIN WILLINGMANN: There are several good reasons for our optimism. Saxony-Anhalt is already an attractive investment location which can offer world-class expertise in a number of areas and many investors have already recognized that. In addition, the German federal government is making more than 4.8 billion euros available to Saxony-Anhalt alone to help with managing structural change. This puts the state of Saxony-Anhalt in the position to make targeted investments itself, including in digital infrastructures.

What are the other areas where Saxony-Anhalt has a lot to offer?

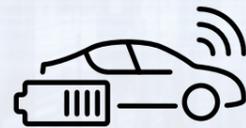
ARMIN WILLINGMANN: Armin Willingmann: Saxony-Anhalt has traditionally been a popular location for the chemical industry. We want to make use of the available expertise to develop a model region for hydrogen over the next few years with strong partners from the world of business, such as Linde and Total, and the Fraunhofer research institutes. While other people are just talking about the potential of hydrogen, we are already funding our first research projects, for example to determine how green hydrogen can be produced and used cost-effectively on an industrial scale and to identify how it can safely be stored. In addition, the Finnish company UPM gave the go-ahead in October for the construction of the world's first biorefinery of its kind in Leuna at a cost of 550 million

euros. From 2022 onward, the plant will be producing biochemicals from sustainably harvested hardwood that can be used to manufacture more sustainable textiles, plastics, rubber, cosmetics and medicines. But Saxony-Anhalt is also an excellent location for industries such as medical technology, pharmaceuticals and biotechnology. This is why I am optimistic that we will succeed in turning Saxony-Anhalt into the state for future technologies.



In conversation: Saxony-Anhalt's Minister for Economy, Professor Dr Armin Willingmann.

New Mobility in Saxony-Anhalt



New mobility is no longer merely an abstract concept. With the emergence of alternative powertrains, autonomous driving and intelligent connectivity, the automotive industry is undergoing a period of fundamental transformation. Saxony-Anhalt has 270 companies in this sector, which employ more than 26,000 people, plus a world-class research landscape. This puts it in an excellent position to help shape the changes that are taking place. National and international companies are investing millions in new plants for batteries and vehicle bodies and new research and development centers are being built. These new facilities are receiving targeted funding from the state's Ministry of Economy. As a result, Saxony-Anhalt is already in a strong position with regard to the new mobility solutions that will be used to transport passengers and goods in the years to come.

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Driving the future

The Magdeburg-Barleben region has developed into a center for new mobility over recent years.

On the doorstep of the state capital: The Magdeburg Innovation and Start-Up Center lies at the heart of the technology park.



The automotive industry is changing rapidly, with advances in electric mobility, more climate-friendly fuels and lightweight design. These changes are putting vehicle manufacturers and automotive suppliers under considerable pressure to adapt. In addition, the importance of research and development is growing.

For this reason, a good location must be able to offer companies, research facilities and start-ups the ideal conditions to be able to overcome these challenges. The Ostfalen Technology Park in Barleben on the doorstep of the state capital is a location of this kind. The technology park is home to the Center for Electromobility and Energy Efficiency, where companies are developing integrated mobility services. Part of the

Magdeburg Innovation and Start-Up Center is also located in Barleben and 80 companies with a total of around 450 employees are based here.

In addition, the Institute for Competence in AutoMobility – IKAM GmbH, a joint venture set up by Otto von Guericke University Magdeburg and the Magdeburg Chamber of Industry and Commerce, is located in the region. The institute is involved with electric mobility, lightweight structures and powertrain, measurement and testing systems. Under the management of IKAM GmbH, companies and research facilities that form part of the interdisciplinary network “BiS-Net: Fuel Cells in Series” are working toward the shared goal of mass-producing market-ready components and fuel cells for portable and stationary applications.



IKAM GmbH provides powertrain, measurement and testing systems for electric vehicles.

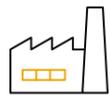


OSTFALEN
TECHNOLOGY PARK
IN FIGURES:



TOTAL AREA
(HECTARES):

275



COMPANIES
ON SITE:

140



JOBS:

2,300

“In order to manufacture fuel cells on a large scale, we need a breakthrough in volume production. The research in this area involves a high level of risk and no one can say for certain when these systems will become widely established on the market,” explains Dr Stefan Schünemann, managing director of IKAM GmbH and coordinator of the BiS-Net. He also emphasizes that: “Nevertheless, we want to help companies to prepare for this with pilot production runs and prototypes so that they can gain important experience in this area and move into new markets. We also want to transfer knowledge into other areas, such as the cooling systems for batteries.”

In future years, Saxony-Anhalt’s Ministry of Economy intends to turn the Magdeburg-Barleben region into an electric mobility campus. The aim is to provide the impetus for automotive industry suppliers to make the structural changeover to electric mobility. The Ministry of Economy is making around 31 million euros available for the creation of a new Center for Method Development (CMD) at the Otto von Guericke University Magdeburg. The center, which is expected to open in 2022, will house ultra-modern test rigs where research can be carried out into solutions that will make the engineering development processes in the automotive industry more efficient.

The Japanese HORIBA Group is also investing in the expansion of its site in Barleben. Among other things, HORIBA is one of the world’s

leading suppliers of test systems for fuel cells, batteries and electrolyzers. Barleben will in future be the home of the group’s global center of excellence for fuel cells and batteries. The 5G – Industrial Working & Co-Working for Medium-Sized Businesses initiative, which is funded by the federal government and Saxony-Anhalt’s Ministry of Economy, also makes the Ostfalen Technology Park into an ideal location for research, production and sales. The initiative is a 5G test environment for medium-sized industrial companies which will lay the foundations for the development of a local 5G environment for industrial use. “With its Innovation and Start-Up Center, the technology park has seen the emergence of a number of highly innovative companies over the years and has become an important contributor to the economy of the northern part of Saxony-Anhalt,” says Minister for Economy, Professor Dr Armin Willingmann.

igz-md.de
ikam-md.de
bis-net.de
tpo.de



Managing director of IGZ,
Dr Stefan Schünemann.



From a niche market to the global market

HORIBA FuelCon develops and manufactures test systems for fuel cells and batteries in Magdeburg-Barleben



Global demand: HORIBA FuelCon is a leading manufacturer of test facilities for batteries and cells.



The managing director of HORIBA FuelCon in conversation with Saxony-Anhalt's Minister for Economy, Professor Dr Armin Willingmann.

Batteries and fuel cells are currently the key features of the mobility transition and have become a permanent part of the model ranges of many vehicle manufacturers. Nowadays, every research and development department needs to be prepared for this new trend.

Dr Ingo Benecke can still remember the time when this technology was a niche market. "We had a stand at the Hannover Messe in 1998 with our test rigs for pumps and gearboxes. One evening a group of people with disappointed expressions on their faces came past our stand. We got into conversation and it emerged that they were looking for test rigs for fuel cells, but none of the exhibitors had them in their product ranges. We soon realized that we would not be starting from scratch in this area and ultimately we built the first test rigs for fuel cells for Opel," explains the managing director of HORIBA FuelCon.

Since then the engineers in Ingo Benecke's team have been working continuously in this area and have developed the highly complex test rigs even further. Today, the company, which is based in Magdeburg-Barleben, is one of the world's leading manufacturers of test systems for batteries and fuel cells. By 2018, the company was doing the majority of its business in Europe and producing test rigs for Volkswagen, Audi, BMW, Bosch and Airbus. For example, it equipped the new battery factory for the Audi Q6 e-tron in Brussels with fully automated test facilities. The US space agency NASA is also testing the fuel cells for its space capsules in Ohio with a test system from Barleben.

The US space agency NASA is also testing the fuel cells for its space capsules in Ohio with a test system from Barleben.



The new company headquarters of HORIBA FuelCon is being built in the Ostfalen Technology Park.

"Over time we have noticed that most of the development is taking place in Asia, particularly in China and Japan. We needed to act quickly, otherwise we would lose our market," explains Ingo Benecke. Initially the company considered setting up subsidiaries in Asia, but this would have been too complex and too costly. During the search for a partner, their attention was drawn to HORIBA, a Japanese company and one of the world's leading suppliers of measurement systems. In 2018, FuelCon AG became the subsidiary HORIBA FuelCon.

The takeover was an important strategic move for the group which reinforced its presence on the market for vehicle electrification. The acquisition has also enabled HORIBA to supply a comprehensive range of testing and development solutions covering the entire life cycle of batteries and fuel cells. This makes it possible for the Japanese group to better meet the growing requirements of the global electric mobility market and to benefit from the increasing demand for test systems. "It was the ideal merger, which has left both organizations in a stronger position," says Ingo Benecke.

The partnership with the Japanese company has also strengthened the location in Magdeburg-Barleben. The rise in global demand and HORIBA FuelCon's role within the group as a center of excellence for fuel cells and batteries has led to the rapid growth of the

company. For this reason, it is in the process of investing 30 million euros in a new building at Ostfalen Technology Park. With 10,000 square meters of office and production space, the new company headquarters will accommodate up to 360 employees from the end of 2021.

"This means that we not only have the technological solutions we need for the future, but are also a major employer in the region," says Ingo Benecke.

Its location in Magdeburg also brings advantages for the company in terms of recruitment. Otto von Guericke University has courses in process and mechanical engineering, information technology and electrical engineering which are precisely the subjects that are of interest to HORIBA FuelCon. "We begin working with students as part of internships and research projects, which is an ideal way for us to get to know one another. And if everything works out, then we employ them as soon as they graduate," explains Benecke.

horiba-fuelcon.com



Fully charged

The battery manufacturer Farasis is investing more than 600 million euros in a factory in Bitterfeld-Wolfen and aims to make the site its European headquarters.



“There is significant potential in the Bitterfeld-Wolfen region.”

A conversation with Sebastian Wolf, the managing director of Farasis Energy Europe, about the company's strategy and plans in Saxony-Anhalt.

Farasis was founded in 2002 in California and employs more than 3500 people worldwide. The company has a research center in the USA and two production facilities in China. Saxony-Anhalt's Ministry of Economy has promised the company substantial investment incentives for its major investment in the south of the state.

Bitterfeld-Wolfen was chosen from a list of more than 30 sites in Europe. What were the key factors that influenced Farasis' decision to locate its new plant in Saxony-Anhalt?

SEBASTIAN WOLF: We were not only looking for a production site, but also for a location where we could establish a complete center of excellence for batteries. Wage costs are a relatively unimportant consideration for battery manufacturing. The majority of our costs come from materials, energy and logistics. Our site in Bitterfeld-Wolfen is located directly on the A9 freeway and is only 20 min-

utes away from Leipzig-Halle airport. We also have links with Germany's second largest chemical industry site, which supplies us with water and the chemicals we need. Working with the state of Saxony-Anhalt and with the town of Bitterfeld-Wolfen has been an extremely positive experience. They acted very quickly and were prepared to give us support. We have not experienced this to the same extent with other potential locations.

You are aiming to develop a Center of Excellence for batteries. What does this involve?

SEBASTIAN WOLF: We want to bring together the entire battery life cycle, including development, production and recycling, in one location. There is significant potential for this in the Bitterfeld-Wolfen region. The area has a strong, open research culture and FEV has just opened the largest battery center in Europe very close to our site.

Big plans:
From 2022,
batteries with
a total capacity
of up to
ten gigawatt
hours will be
produced each
year.



“The area has a
strong, open research
culture...”

Which customers does Farasis have for the batteries produced in Bitterfeld-Wolfen?

SEBASTIAN WOLF: One of our main customers is Daimler. We will also be supplying lithium-ion battery cells to the Turkish carmaker Togg, which is currently developing the first Turkish electric car.

Farasis intends to make its production CO₂-neutral. What does your concept involve?

SEBASTIAN WOLF: We are optimizing the processes on the consumption side. This means using machines with very low consumption levels and keeping the energy-intensive clean rooms and dry rooms as small as possible. We will use only green electricity and biogas and are also in discussions about taking measures in the region to offset the remaining CO₂.

What is the schedule for the new plant?

SEBASTIAN WOLF: Our plan has several phases. From 2022, we will be producing batteries with a total capacity of eight to ten gigawatt hours each year. This will involve employing about 600 people. In the medium term, we intend to expand the site and create a total of up to 2000 jobs.

[farasis.com](https://www.farasis.com)

Good for the environment:
Production in the new Farasis plant will be CO₂-neutral.



Press shop 4.0

Porsche and Schuler are investing in the Star Park in Halle (Saale).

The sports car manufacturer Porsche and the sheet metal forming specialist Schuler are building an ultra-modern press shop for body components in the Star Park in Halle (Saale). The plant will primarily produce external parts for vehicle bodies. The entire production process in the Star Park will be digitally networked and the data will be easily accessible. Porsche and Schuler are planning a joint investment of around 100 million euros in the press shop. The new plant is the first to be part of the Industry 4.0 strategy of the two companies, which have founded the joint venture Smart Press Shop GmbH & Co. KG for the purpose. The press shop, which is located very close to Porsche's Leipzig plant, will come into operation in mid-2021. A highly efficient logistics system will allow the CO₂ emissions from the production process to be reduced. Around 100 jobs will be created in the Star Park during the start-up phase. It is entirely possible that the plant will be expanded, because in addition to the 13 hectares of land for the press shop itself, the two companies have also acquired a further 31 hectares.

“Schuler is a highly competent and innovative partner which is setting new standards in the digitalization of forming technology,” explains Albrecht Reimold, Member of the Executive Board for Production and Logistics at Porsche. “Our joint venture represents another major step forward in sports car production. We can link design, development, bodywork planning, tool manufacturing and production even more closely together and increase the efficiency of our processes.”

“The close cooperation with Porsche – an important customer for us with very exacting standards – is our main focus,” says Domenico Iacovelli, CEO of Schuler AG. “At the same time, we see the joint construction and operation of the smart press shop as a project which will enable us to take the efficiency of our production systems and the digitalization of important stages in the process of car manufacturing onto a new level in terms of forming technology.”

[porsche.de](https://www.porsche.de)
[schuler.de](https://www.schuler.de)



Zero-Co₂: 12,000 square meters of photovoltaic panels provide energy.

Testing to the limit

FEV has the world's largest development and test center for high-voltage batteries. The electricity that powers the center comes almost exclusively from its own photovoltaic system.

FEV, a leading international provider of design and development services for hardware and software for vehicles and powertrains, has brought into operation the world's largest development and testing center for high-voltage batteries at its site in Sandersdorf-Brehna in the triangle between Halle (Saale), Dessau and Leipzig. The new center has 54 climatic and temperature chambers, eight chambers for environmental testing, a shaker system for mechanical tests, which is the only one of its kind in the world, and five chambers for abuse tests. It will be testing batteries for cars and trucks from almost all the world's vehicle manufacturers.

The test facilities allow all the factors that influence battery behavior to be simulated. These include driving conditions on roads ranging from freeways to dirt tracks, flooding and extremely cold and hot weather.

In addition, FEV exposes the batteries to fires and impacts in order to obtain important information about how high-voltage batteries behave in the event of an accident. The center will also run endurance tests covering up to 250,000 kilometers. In addition, it has a workshop where the batteries can be disassembled after testing. The new development and test center is the largest of its kind in the world.

“As one of the world's leading developers of technologies for electric vehicles, FEV produces innovative, future-proof solutions. The new test center allows us to demonstrate our expertise to our customers yet again. In addition to providing our partners with the best possible technical support, we can also save them development time and costs,”

says Professor Stefan Pischinger, President and CEO of the FEV Group. He adds: “We currently have a total of 69 test systems, which means that we can provide all the internationally established test methods for batteries under one roof.”

The energy needed to test components is provided almost entirely by electricity generated from renewable resources. This comes from 12,000 square meters of photovoltaic panels which cover the entire roof of the building and have an output of over 900 kWp. “The new facility is climate-friendly and operates on the basis of a zero CO₂ emissions approach,” explains Pischinger.

The foundations for the success of FEV were laid in Saxony-Anhalt in 2007. The FEV Group has another site in Sandersdorf-Brehna where powertrains of all kinds are subjected to endurance tests. The new test center reflects the significant increase in electric mobility. FEV employs around 6,700 people on five continents worldwide and 350 of them work in Saxony-Anhalt. Over recent years, Saxony-Anhalt's Ministry of Economy has supported FEV's investment with a total of 15 million euros from the Joint Task for the Improvement of Regional Economic Structures (GRW).

fev.com
edlp.fev.com

Testing to the limit: FEV tests batteries in climate and temperature chambers.



Hydrogen in Saxony-Anhalt



Saxony-Anhalt is one of the most attractive locations for the global chemical industry. Companies from the sector have been working on new developments in the state for more than 100 years. A good infrastructure and well-functioning networks create profitable synergies. The companies and research institutions that are based here are leading players in the field of hydrogen. The investments in this technology have turned Saxony-Anhalt into the center of the German hydrogen industry.

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Leuna – a flagship location

The Chemical Park Leuna is laying the foundations for the future with several major investments.

The skyline of Leuna: TOTAL operates an ultra-modern refinery at the site.



The success of the Chemical Park Leuna has always been determined by bold, forward-looking plans. In the early years of the 20th century, the chemist Carl Bosch invented the process of industrial ammonia synthesis, which meant that methanol was produced for the first time on a global scale using a high-pressure process in Leuna from 1923 onward. It was also in Leuna that caprolactam was synthesized to produce perlon. In addition, the first production plant for synthetic surfactants was also established in Leuna.

Over the last 30 years, this historic chemical industry site has become the home of several international chemical companies. The site in

the south of Saxony-Anhalt offers a complex network of materials and an excellent infrastructure. At the heart of the network in the Chemical Park Leuna are the TOTAL refinery, the caprolactam synthesis plant of the DOMO Group and the world's largest gas center, belonging to Linde GmbH, where industrial gases are produced.

Once again it is forward-looking plans that are encouraging companies to invest in Leuna. The expertise and the infrastructure at the site create the ideal conditions for it to become the center of the German hydrogen industry. The basis for this is the manufacture of green hydrogen on an industrial scale, which is what the researchers at the Fraunhofer-Gesellschaft



Everything under control: Dr Markus Wolperdinger, head of the Fraunhofer IGB, Dr Sylvia Schattauer, deputy head of the Fraunhofer IMWS and Professor Dr Armin Willingmann, Minister for Economy, Science and Digitalization of the state of Saxony-Anhalt at the formal ground-breaking ceremony for the electrolysis test and trial platform.



CHEMICAL PARK LEUNA IN FIGURES:



TOTAL AREA (HECTARES):

1,300



COMPANIES ON SITE:

100



JOB:

10,000

aim to achieve. Saxony-Anhalt's Ministry of Economy is supporting their research projects, including the ELP electrolysis test and trial platform, with funding of more than eight million euros.

The TOTAL Group is an active supporter of the electrolysis platform that is being built on the site of the chemical park. It will function as a test platform for a wide variety of electrolysis technologies. The investment reflects the significant interest among companies in this research project that is taking place in an industrial environment.

The conditions for establishing a model region for hydrogen in Leuna are ideal. There is considerable potential for renewable energy generation in Saxony-Anhalt, together with a well-developed hydrogen infrastructure that can be used for green hydrogen.

Central Germany has the second largest hydrogen pipeline network in the country and salt caverns that are suitable for use as large-volume hydrogen storage facilities. In addition, many of the companies based in the area have extensive experience of producing hydrogen and using it for industrial purposes. There is also an established research infrastructure with institutes and firms which have joined together to create the HYPOS network with the aim of identifying innovative uses for hydrogen.

infraleuna.de
hypos-eastgermany.de

Chemical companies come together in the largest chemical park in Germany.



“We have been committed to hydrogen mobility right from the start.”

In his guest column, Dr Willi Frantz, managing director of TOTAL Raffinerie Mitteldeutschland GmbH in Leuna, highlights the opportunities and development prospects that hydrogen technology can offer TOTAL.



The TOTAL Group has an ambitious climate target of net zero emissions by 2050 for its global activities. To achieve this, it is positioning itself as a broad-based energy supply company. Our CEO recently announced that TOTAL intends to be one of the world's top five renewable energy suppliers. He speaks about “TOTAL Energies”.

Some of the changes made over the last few months clearly demonstrate that we take this seriously. Hydrogen technology plays an important role in our plans. It will be one of a whole series of solutions needed for defossilizing the economy and achieving the energy transition.

In Germany we have been committed to hydrogen mobility right from the start. Given that there are good prospects for hydrogen technology in Germany because of the existing infrastructure, expertise in processing and handling hydrogen and suitable consumption patterns, then Leuna is the place to be. The German government has already answered the question in its National Hydrogen Strategy, which specifies that, of the five gigawatts of green hydrogen capacity to be installed in Germany by 2030, two gigawatts are planned for areas near refineries.

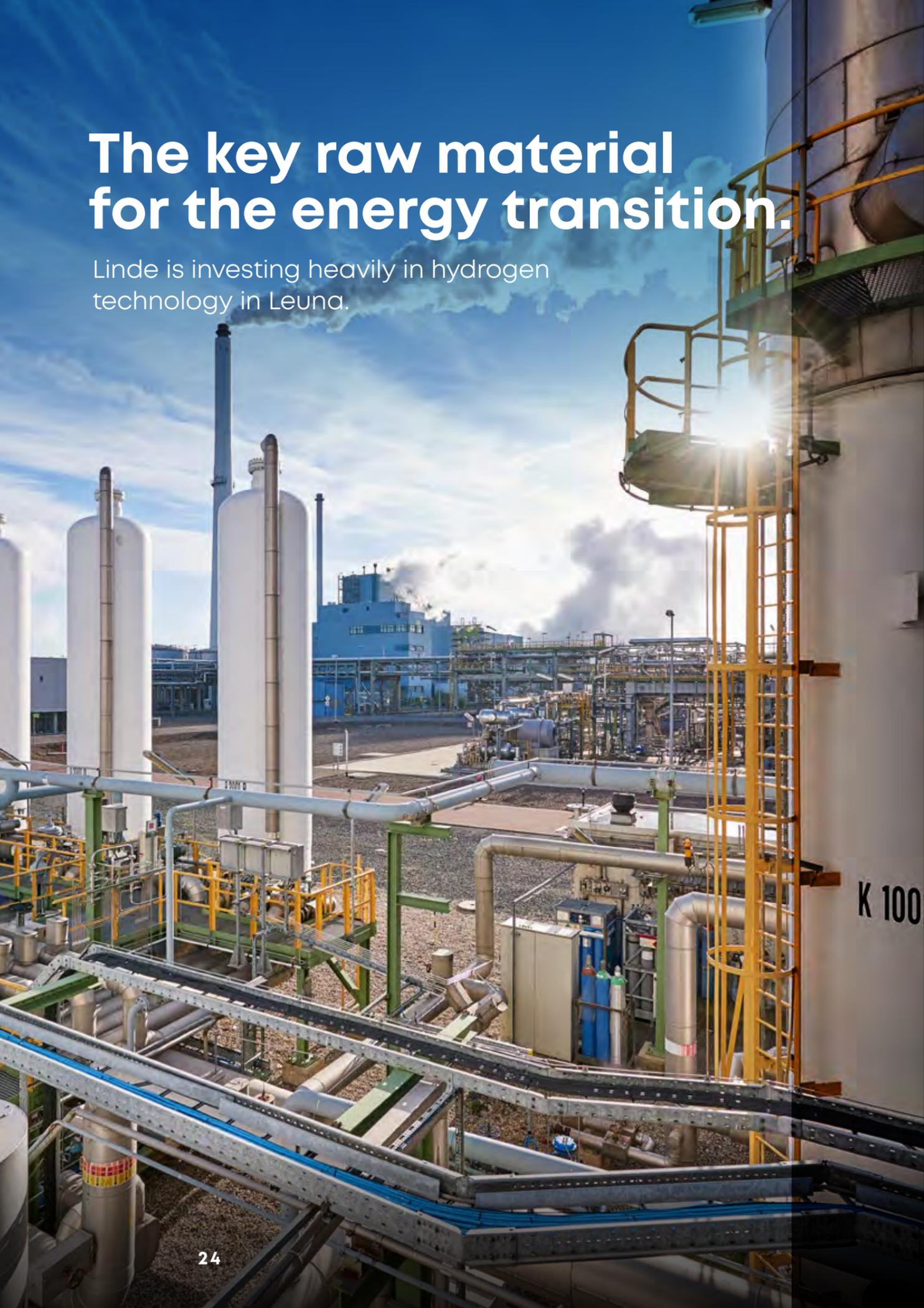
I fully support the German government in this respect. Refineries are industrial facilities with the highest levels of hydrogen consumption and are therefore ideal locations for starting the production of green hydrogen on an industrial scale. Like biofuels and their components, green hydrogen now has a place in the petrochemical landscape. This is true not only for fuels but also for basic chemicals such as methanol and ammonia.

TOTAL is already involved in green hydrogen initiatives at the Chemical Park Leuna.

TOTAL Raffinerie Mitteldeutschland GmbH is working with Sunfire and emphasizes the importance of hydrogen in solving the pressing problems of the future.

The key raw material for the energy transition.

Linde is investing heavily in hydrogen technology in Leuna.



“There is a huge amount of hydrogen expertise here.”

A conversation with Andreas Dietrich, head of Linde's site in Leuna, about the fuel of the future and central Germany as a location for industry.

Linde is investing heavily in hydrogen technology at its site in Leuna. What role will the raw material of the future play?

ANDREAS DIETRICH: From my perspective, hydrogen is the key raw material for the success of the energy transition. If we want to cut our CO₂ emissions, we can only achieve this with the help of hydrogen. The big advantage of hydrogen is that it can be used for a number of purposes – for storing electricity, for heating and for transport. For example, it is easy to convert diesel engines to run on hydrogen.

Hydrogen is often seen as too expensive and not cost-effective. Is that likely to change in future?

ANDREAS DIETRICH: Hydrogen has been used in industry in large quantities for over 30 years. But this hydrogen has been manufactured from natural gas, which has been split into carbon and hydrogen. That is the most common method and it is relatively cheap, because it uses fossil raw materials. The hydrogen that we are talking

about is produced by electrolysis and is referred to as green hydrogen. Electricity is needed in the manufacturing process and the cost of electricity makes the green hydrogen more expensive. It costs around 2.5 to 3 times as much as the grey hydrogen produced from natural gas. This higher price is to a certain extent the sticking point. The electrolysis systems are currently all made by hand. If the manufacturing process could be automated, the price would undoubtedly fall to 30 percent of its current level.

Linde GmbH is building a new hydrogen liquefier in Leuna. What is the strategy behind this?

ANDREAS DIETRICH: This investment will allow us to double our capacity for high-purity hydrogen. This is used in particular in the electrical industry in the manufacture of chips. In Europe there are four hydrogen liquefiers and two of those are in Leuna. Ten times more liquid hydrogen than hydrogen gas can be transported in one truck. When the plant goes into production in January 2021, we will be manufacturing ten tonnes of hydrogen every day.



On the move: Linde supplies its customers with hydrogen in liquid form.

What makes the Chemical Park Leuna attractive to investors?

ANDREAS DIETRICH: We have an excellent pipeline network and there is only one other like it in Germany. This means that the Chemical Park Leuna and the chemical sites in Bitterfeld and Zeitz can be supplied with all the industrial gases they need via the pipeline. In addition, a large number of chemical companies have moved to Leuna. This variety is what makes Leuna a flagship location.

A huge amount of expertise in hydrogen has been acquired here over the years, so new skills are not needed in this area. The safety systems and the pipelines are of very high quality. In addition, there are several good cooperative projects underway. In the field of hydrogen, Linde is working closely with Siemens and with the Fraunhofer institute in Halle (Saale).

In Bad Lauchstädt, not far from Leuna, there are salt caverns where natural gas is stored. It is possible that they could be used as a storage location for hydrogen. This would allow electricity, which cannot be stored directly, to be stored indirectly in the form of hydrogen.

Where do you think Linde in Leuna will be in ten years' time?

ANDREAS DIETRICH: We will make major developments in the field of hydrogen to enable us to produce larger quantities of green hydrogen. We will also significantly reduce the CO₂ footprint of our production processes for other industrial gases such as oxygen and nitrogen.

A strategic move into the future

Saxony-Anhalt provides the ideal conditions for the development of a forward-looking hydrogen economy. There is extensive experience of using hydrogen in the Middle German Chemical Triangle.

The government of Saxony-Anhalt is currently preparing a hydrogen strategy for the state. The goal is to develop an electrolysis capacity of 1,000 megawatts here by 2030. To achieve this, additional wind and solar energy facilities with a power output of 5,000 megawatts are needed. From 2040 onward, Saxony-Anhalt plans to cover its hydrogen requirements from its own resources. The hydrogen will be produced in large industrial plants that are connected to national and international networks.

In the context of the structural change in the coal-mining region of central Germany, the hydrogen economy offers major opportunities for developing a growth region for renewable energies.



The bio-economy in Saxony-Anhalt



The responsible use of resources is one of the key concerns of our era. Saxony-Anhalt takes its responsibility in this area very seriously. More than half of the electricity generated in the state already comes from renewable sources. Saxony-Anhalt is a traditional location for the food, chemical, timber and agriculture industries and the companies here, which are familiar with natural cycles, are setting new standards for the bioeconomy.

invest-in-saxony-anhalt.com

Wheat straw in the tank

In Leuna, Global Bioenergies and the Fraunhofer Center for Chemical-Biotechnological Processes are working together to develop innovative fuels.

Microbial conversion: The pilot plant at the Fraunhofer Center for Chemical-Biotechnological Processes (CBP) in Leuna.



Climate change and mobility are closely linked, which is why we must significantly reduce our use of fossil fuels in the medium term. We need alternative, climate-friendly solutions to take us into the future. Straw, wood and microalgae all have the potential to replace crude oil as raw materials for the chemical industry.

Companies at the Chemical Park Leuna are investigating these materials. The French company Global Bioenergies is working with the Fraunhofer Center for Chemical-Biotechnological Processes to develop a process to convert renewable raw materials into isobutene. This is one of the building blocks of the petrochemical industry which is normally obtained from crude

oil and can be processed to produce gasoline, aviation fuel and plastics. In a pilot plant that was set up in 2015, researchers have successfully converted sugar made from wheat straw into bio-isobutene. The Global Bioenergies demonstration plant in Leuna is the only one in the world that uses a direct microbial conversion process to produce gaseous hydrocarbons from renewable raw materials.

The carmaker Audi is a partner of Global Bioenergies. Audi is testing the biofuel isooctane, also known as Audi e-gasoline, which is made from isobutene, in its engines. Isooctane produces very low levels of pollutants, because it contains no sulfur or benzene.



The Fraunhofer Center for Chemical-Biotechnological Processes in Leuna is part of the Fraunhofer Institute for Interfacial Engineering and Biotechnology in Stuttgart. The establishment of the center represents an important step toward turning the Chemical Park Leuna into a central, integrated location for biochemicals and petrochemicals and ensuring that it plays a pioneering role in the industrial use of renewable raw materials.

A pilot plant is currently being set up which will produce green hydrogen for use in low-emission manufacturing processes for basic chemicals and fuels. The Fraunhofer Center for Chemical-Biotechnological Processes in Leuna and the Fraunhofer Institute for Microstructure of Materials and Systems in Halle (Saale) are pooling their resources to build the plant. The project, which is also being funded by Saxony-Anhalt's Ministry of Economy, will investigate the entire value chain of synthesis gas manufacturing using water, renewable energy and carbon dioxide. The objective is to manufacture fuels using a chemocatalytic process. This will initially be demonstrated by the two Fraunhofer institutes and subsequently scaled up. Ultimately the fuels will be tested in vehicles. —

global-bioenergies.com
cbp.fraunhofer.de

A future with hardwood

UPM is investing 550 million euros in the construction of the world's first biorefinery of its kind in Leuna.

For UPM the future lies in wood. The Finnish company is currently investing 550 million euros in an industrial biorefinery at the Chemical Park Leuna. The biochemicals produced from wood will allow for the move from fossil to sustainable raw materials in a number of areas of industry. In the refinery, a new generation of sustainable basic chemicals will be manufactured from hardwood. These include bio-monoethylene glycol, functional fillers, bio-monopropylene glycol and industrial sugars.

"Sustainable chemicals made from biomass are one of our company's three strategic areas of growth and are central to our efforts to develop innovations for a future without fossil raw materials. In recent years, UPM has successfully established a profitable business producing wood-based biofuels," explains Jussi Pesonen, President and CEO of UPM. "By



Jyrki Ovaska, Executive Vice President Technology of UPM

"By investing in the biorefinery in Leuna, we are creating a completely new business area with significant potential for growth."

JUSSI PESONEN

investing in the biorefinery in Leuna, we are creating a completely new business area with significant potential for growth. We are helping our customers to make their companies and their products more sustainable. The range of biochemicals made from renewable raw materials is currently very limited."

The Ministry of Economy is contributing around 20 million euros to the construction of the biorefinery. "The new plant gives the Chemical Park Leuna and the former coal-mining region of central Germany highly attractive prospects for growth," said the Minister for Economy, Professor Dr Armin Willingmann, at the formal ground-breaking ceremony in October 2020.

The applications for biochemicals include textiles, PET bottles, packaging, de-icers, composites, medicines, cosmetics and detergents. Almost all the demand in these areas is currently met by fossil raw materials such as oil, natural gas and coal. Alongside their climate benefits, the sustainable fillers supplied by UPM have better properties than conventional fillers in terms of both weight and purity. In addition, the products can easily be used in customers' existing production processes and recycling infrastructures.

The combination of renewable raw materials and new production processes will lead to a significant reduction in the CO₂ footprint when compared with similar products based on fossil



Ground-breaking ceremony in Leuna: Dr Michael Duetsch (UPM Biochemicals), Dr Reiner Haseloff (Minister President of Saxony-Anhalt), Jyrki Ovaska (Executive Vice President Technology UPM) and Saxony-Anhalt's Minister for Economy, Professor Dr Armin Willingmann.

fuels. It is important to the company to have a purely European value chain and to produce locally and sustainably for its customers. The biorefinery processes sawmill residues and sustainably certified industrial hardwood that has been selectively felled. As there is a large supply of timber in the region, the investment in the biorefinery supports the sustainable industrial use of forests to protect the climate and reinforces the German bioeconomy strategy.

Leuna is a European center of the chemical industry and is also close to important customers in Germany, which makes it the ideal location for the biorefinery. This chemical industry site in the south of Saxony-Anhalt is an attractive setting for the construction of the plant and, with its existing infrastructure and excellent connections to other local infrastructures, it is a highly competitive location.

The start of production at the refinery is planned for the end of 2022. The total annual capacity will be 220,000 tonnes. —

upmbiochemicals.com/biorefinery

Medical technology and pharmaceuticals in Saxony-Anhalt



Health relies on more than just good luck. Surgical robots, imaging processes and intelligent catheters are just some of the latest medical systems to be produced in Saxony-Anhalt. Highly innovative companies from the pharmaceutical and biotech industries form a strong cluster here. In cooperation with universities and research institutions, they are developing new and improved diagnostic and therapeutic methods.

invest-in-saxony-anhalt.com

Experience paves the way

IDT Biologika from Dessau is carrying out research into a coronavirus vaccine.

Expertise and experience: IDT Biologika employs 1500 people at the BioPharma-Park Dessau.



The process of having a new vaccine approved normally takes several years. But in the midst of the coronavirus pandemic, we do not have this much time to play with. Researchers all over the world are putting every effort into finding a vaccine for the SARS-CoV-2 virus. This is the top priority for IDT Biologika, a company based in Dessau-Roßlau. The compounds produced by IDT have been helping in the fight against diseases and epidemics for several years.

IDT Biologika is now one of the leading players in the search for a coronavirus vaccine. The company is working closely with the German Center for Infection Research and with partners at the Universities of Munich and Marburg to develop a vector vaccine. This involves

inserting genetic information from a surface protein of the coronavirus into a harmless carrier virus that will not cause a disease but will stimulate the immune system into producing antibodies.

“We can build on a system that has been clinically tested for 20 years. We know that the vaccine is effective in animal tests and that we are on the right track. But we don’t yet know if it protects people and provides the required level of immunity,”

explains Dr Andreas Neubert, head of research and development at IDT Biologika.



Together with its partners, IDT Biologika is developing a coronavirus vaccine.



BIOPHARMAPARK
DESSAU
IN FIGURES:



TOTAL AREA
(HECTARES):

120



COMPANIES
ON SITE:

5



JOBS:

2,200

IDT and its research partners have received around 114 million euros of funding for the phase I to III clinical trials and the application for the approval of the virus. The Federal Ministry of Education and Research has provided a total of 750 million euros to accelerate vaccine development and manufacturing in Germany. IDT Biologika is one of the three companies working on a vaccine that the German government is pinning its hopes on.

As well as developing the virus as quickly as possible, it is also essential to make the necessary production capacity available. Regardless of whether the efforts of IDT Biologika or one of the other companies leads to the decisive breakthrough, the required number of doses of the virus must be manufactured.

“Here in central Germany, we have the unique capability to cover the entire vaccine manufacturing process from research and development through to the filling and packaging of the vials. We need the production capacity not only to combat the coronavirus but also to be ready for future pandemics,”

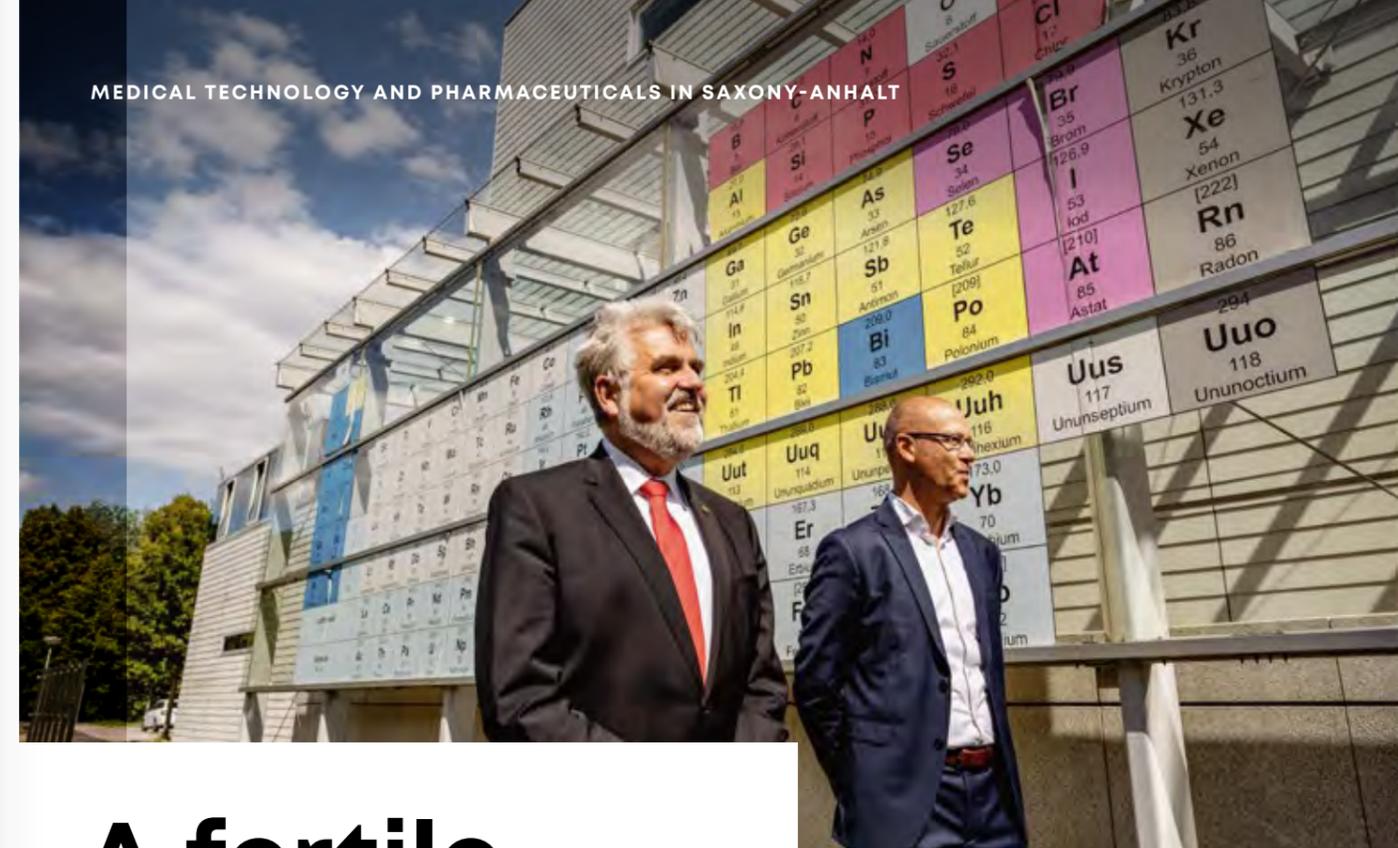
says Dr Jürgen Betzing, managing director of IDT. The family business has spent a lot of its own money to help overcome the challenges

the world is currently facing and to meet its own standards of social responsibility.

The biotech company IDT Biologika has a history that dates back almost 100 years. Its roots go back to 1921 when scientists at the Bakteriologische Institut der Anhaltischen Kreise (the bacteriological institute of the Anhalt region) were carrying out research into tuberculosis. They laid the foundations for the production of human and animal vaccines. Nowadays IDT Biologika manufactures human vaccines on behalf of companies all over the world. The company currently has around 1500 employees. Since it was founded in 1993, IDT Biologika has invested around 400 million euros in its headquarters at the BioPharmaPark in Dessau-Roßlau.

idt-biologika.de

The development of vaccines in Dessau dates back to 1921.



A fertile soil

The Weinberg Campus Technology Park in Halle (Saale) is an innovation center for the life sciences, biomedicine and material sciences sectors in central Germany.

Familiar with the elements: Saxony-Anhalt's Minister for Economy, Professor Dr Armin Willingmann, with the managing director of the TGZ Dr Ulf-Marten Schmieder.

rial scientists and pharmaceutical, agricultural and nutrition scientists work side-by-side at the Weinberg Campus.

A number of prominent institutes and societies form the scientific basis for this work, including the Fraunhofer Institute for Microstructure of Materials and Systems, the Helmholtz Center for Environmental Research, the Leibniz Institute of Plant Biochemistry and the Max Planck Institute of Microstructure Physics. In addition, the science faculties of Martin Luther University Halle-Wittenberg and the university hospital are both based on the campus.

The Technology and Start-Up Center (TGZ) plays a key role on the Weinberg Campus. It acts as the interface between applied research, development and production and supports innovative start-ups. More than 250 companies have already been set up in the TGZ.

The terroir of a vineyard is known to have a significant impact on the quality of the wine. At the Weinberg Campus in Halle (Saale), whose name means “vineyard” in German, this principle also applies to research. The technology park is the perfect combination of science and business and provides ideal conditions for the research facilities, institutions and companies based there. The campus covers an area of 134 hectares and more than 6000 people work there in over 100 institutes and companies, making it the largest technology park in central Germany. Biochemists, biotechnologists, mate-

One of these is SmartMembranes, which was founded in 2009 by two scientists, Dr Petra Göring and Monika Lelonek. The company is now the world's leading manufacturer of porous, highly ordered materials made from aluminum oxide and silicon. The membranes can filter gases and liquids, but they can also offer protection against contamination from bacteria, dust and viruses. The laboratories and offices of SmartMembranes on the Weinberg Campus provide the ideal working conditions.



Dr Petra Göring is one of the two founders of Smart-Membranes.

“Here we have the infrastructure that we need and a close-knit network with the research institutions that are based here, including the Fraunhofer Institute for Microstructure of Materials and Systems and Martin Luther University. After we moved in, we were able to get started straight away,”

says Dr Petra Göring, a chemist who worked as a researcher at the Max Planck Institute of Microstructure Physics before setting up the company.

NH DyeAGNOSTICS GmbH was also established in the TGZ by Dr Jan Heise. This start-up develops, produces and sells products that can be used to identify protein biomarkers of cancer, for example. Jan Heise is currently heading a consortium that aims to bring a rapid coronavirus test onto the market (interview page 37).



The fine membranes produced by Smart-Membranes can filter gases and liquids.

Heppe Medical Chitosan GmbH is also based in the Technology and Start-Up Center on the Weinberg Campus. This company, which was founded by Katja Richter, manufactures the raw material chitosan that is used in the pharmaceutical industry in more than 40 countries. Chitosan is an endogenous substance, which means that it is produced inside the body. As a result, it is very well-tolerated and can be easily broken down. Because of these properties, the pharmaceutical industry uses chitosan as a transport agent for drugs. It is also valuable to the medical technology industry, for example as a coating material for implants. Katja Richter took her degree in biotechnology at Braunschweig University and worked part-time on chitosan at Bio-Zentrum Halle during her studies. This is when she found out about the Weinberg Campus. Later she founded her own company in the TGZ.

The physicists Dr Ruzin Aganoglu and Stephan Kufner had worked for several years in the field of optics and medical technology before founding Lab-on-Fiber GmbH and moving to the Weinberg Campus in 2018. This start-up develops laser probes for minimally invasive surgery.

More than 100 life sciences and material sciences companies are currently based at the Weinberg Campus Technology Park which is the ideal location for them to grow and flourish.

technologiepark-weinberg-campus.de



WEINBERG CAMPUS
TECHNOLOGY PARK
IN FIGURES:



TOTAL AREA
(HECTARES):
134



COMPANIES
ON SITE:
100



JOBS:
6,000



“I can't ignore things like this.”

A conversation with Dr Jan Heise, scientist and founder and managing partner of NH DyeAGNOSTICS GmbH (NHD) in Halle (Saale), about the development of rapid COVID-19 tests.

NH DyeAGNOSTICS GmbH (NHD) develops innovative products for identifying protein markers. Since June 2020, NHD has been working at high speed with its partners to develop a coronavirus test that can be used in developing countries.

also developed an app that provides information for users about how to dispose of the test and what they must do if they are infected. That is very important, particularly in developing countries.

Was it difficult to get funding for the project?

JAN HEISE: First of all, we had our initial concept of developing, validating and producing a rapid test in six to eight months assessed by experts. Then we sent an application to the German Federal Ministries of Health and of Education and Research. The application was processed very quickly and we were given the approval to go ahead. This means that the government is funding a large proportion of the development costs, which amount to a total of six million euros.

What is the schedule for the development of the new test?

JAN HEISE: We started on June 1, 2020 and we aim to bring the new tests onto the market in early February 2021. Around 60 scientists are working on the project and they are all highly motivated and committed. At the moment things are looking really good and everything is going to plan.

How did you reach the decision to develop a coronavirus test?

JAN HEISE: When it became clear in the spring that the world was in the grip of a virus pandemic, my wife and I asked ourselves what our company could do to help. We have been working for 18 months as part of a consortium to develop a rapid test for drinking water quality and we realized that our work formed a good basis for a rapid coronavirus test. And because I can't ignore things like this, I asked our partners in the consortium whether we should develop a fast test that could be used even in the poorest communities. The real catastrophe isn't taking place in Germany, but in developing countries.

How does the test work?

JAN HEISE: It is easy to use and is similar to a pregnancy test. After you have taken a swab, the test takes about 15 to 20 minutes. If you see one stripe, everything is fine. If you see two stripes, the person has the virus. We have

dyeagnostics.com

A port for world-class research

The Research Campus *STIMULATE* in Magdeburg has developed into a highly respected innovation center for image-guided medicine. This is based on close cooperation between the researchers and Siemens Healthcare.

A strong partner: Siemens Healthcare supports the research campus with the latest medical technology.

The Research Campus *STIMULATE* is revolutionizing image-guided medicine.



Image-guided, minimally invasive procedures are particularly important in the treatment of tumors and vascular diseases and also of neurological conditions. This specialization is one of the key strengths of *STIMULATE*. Demographic change and the increase in age-related conditions have led to the need for personalized medicine which uses new diagnostic and therapeutic methods.

A long time ago, the brick-built warehouses in the former commercial port of Magdeburg were used to store sugar and grain. Now the old port district has been transformed into a center for innovation and science. The historic buildings on the inner harbor next to the River Elbe are now home to start-ups, newly arrived businesses and spin-offs from universities.

Since 2020, the new ultra-modern laboratories of the Research Campus *STIMULATE* have been located in "Warehouse B", which was renovated with a grant of 20 million euros from the Ministry of Economy. The name *STIMULATE* reflects the new and innovative technologies used for image-guided, minimally invasive diagnostics and therapies in the field of medicine.

"We want to introduce a new type of operation. The results of our research will soon be used to treat patients and will eventually become part of everyday life in the medical world. Our vision is that the Research Campus and the Port of Science will become a flagship location for research into medical technology. The new research building in the Port of Science brings us one step closer to turning our vision into reality,"

says Professor Georg Rose, spokesperson of the Research Campus *STIMULATE*. The research campus provides the ideal conditions for achiev-



**World-class high-tech solutions:
New imaging processes are
transforming medicine.**

the liver and the lungs. During the project, individual treatments will be transferred into the everyday clinical routine. In addition, the scientists are developing an operating theater equipped with robots for high-precision treatment of tumors and metastases of the spine. One particularly innovative approach involves evaluating and monitoring image-guided interventions using immunoprofiling methods, which allows the intervention parameters to be optimized and the recurrence of tumors to be predicted.

In the field of neurology, researchers at *STIMULATE* are creating an interventional operating theater as a central location or one-stop-shop for acute stroke therapy. On the basis of the motto "Time is brain", this will allow the procedures and the treatment to be speeded up significantly.

As well as the varied research and development activities that take place at *STIMULATE*, it also provides scientific and practical training for doctors and medical technicians. In addition, life on the campus encourages interdisciplinary cooperation between doctors and engineers, which makes it possible to develop innovative medical technology products. A cooperation agreement is also in place for a long-term collaboration between Harvard Medical School (Boston, USA) and the Research Campus *STIMULATE*.

The Research Campus *STIMULATE* has also proved to be successful at transferring scientific findings into the world of business and establishing good conditions for spin-offs and company relocations. The research campus supported the start-up Neoscan Solutions GmbH. This new company has developed an innovative MRI system for newborns and is

ing this with its ultra-modern research infrastructure. It also works in close cooperation with Siemens Healthcare.

In addition to standard laboratories for the development of electronic and mechanical components and for rapid prototyping, *STIMULATE* also has its own interventional 3T MRI system and a modern angiography lab, plus CT and VR/AR labs and cell biology labs. These unique facilities allow research in the field of interventional therapies to be carried out quickly and efficiently and evaluated in realistic situations.

The focus on application-based research reinforces the transfer process and connects businesses with research institutions. The network of companies and universities has been strengthened by their combined move into the newly renovated building where business-people, scientists and medical specialists are located next door to one another. The *STIMULATE* Research Campus is a public-private partnership between Otto von Guericke University Magdeburg, Siemens Healthcare GmbH and the *STIMULATE* association. As a public-private partnership for innovation, the research campus is funded not only by the German Federal Ministry of Education and Research, but also by the state of Saxony-Anhalt and the European Union.

One central area of research is oncology. An integrated high-tech operating theater is being set up which uses versatile MRI systems for minimally invasive diagnostics and treatment of tumors and metastases, in particular in



RESEARCH CAMPUS
STIMULATE
IN FIGURES:



PARTNER
STRUCTURE:

3*



SCIENTISTS:

60



MEMBERS OF
THE *STIMULATE*
ASSOCIATION:

30

*Otto von Guericke
University Magdeburg,
Siemens Healthineers,
STIMULATE association

based next door to "Warehouse A" where the devices are manufactured and sold.

The old commercial port in the capital of Saxony-Anhalt has not lost its traditional atmosphere. However, it is now no longer sugar and grain that are stored here, but innovative expertise which travels out from Magdeburg all over the world.

The vision of *STIMULATE* is to make the Port of Science into a high-tech campus for medical technology, where research and business

can work side-by-side, develop a symbiotic relationship, create innovations and launch them onto the market.

"The Research Campus *STIMULATE* is a flagship project where partners from universities and industry can work on 21st-century medical technology solutions," says Saxony-Anhalt's Minister for Economy, Professor Dr Armin Willingmann.

forschungscampus-stimulate.de

The old commercial port of Magdeburg is now an ultra-modern science campus.





Big progress for the smallest people

Neoscan Solutions from Magdeburg is revolutionizing MRI diagnostics.

Magnetic resonance imaging (MRI) is an essential part of medical diagnostics. However, this procedure is used very rarely for newborn babies because transporting them into the radiology department is not without risks and the appointments are often tightly scheduled, which is difficult to manage in the case of babies.

The start-up Neoscan Solutions GmbH from Magdeburg has set itself the goal of bringing MRI technology to the patients on children's wards. "The progress made in safe, high-resolution imaging should be made available to as many people as possible. We want to make sure that the latest advances reach the smallest and most vulnerable patients," says managing director Dr Stefan Röhl.

In contrast to conventional MRI systems, no special building infrastructure is needed for the devices developed by Neoscan Solutions, because they are much smaller and lighter and the strong magnetic fields inside are very carefully screened. The result is that much less space is needed for the MRI systems, which means that they can be installed directly on the children's wards. In addition, the MRI systems developed in Magdeburg are compatible with the incubators used on premature baby wards to keep the tiny babies warm and supply them with oxygen. In 2021, all the approvals will have been granted for the newly developed product, which means that it can be made available on the market.

The person behind the Neoscan Solutions project is the physicist Dr Stefan Röhl. His world-class partners on the project are the Research Campus *STIMULATE* and Otto von Guericke University Magdeburg.

neoscan-solutions.com



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AND LOCATION SERVICE



INTERNATIONAL
BUSINESS SERVICE



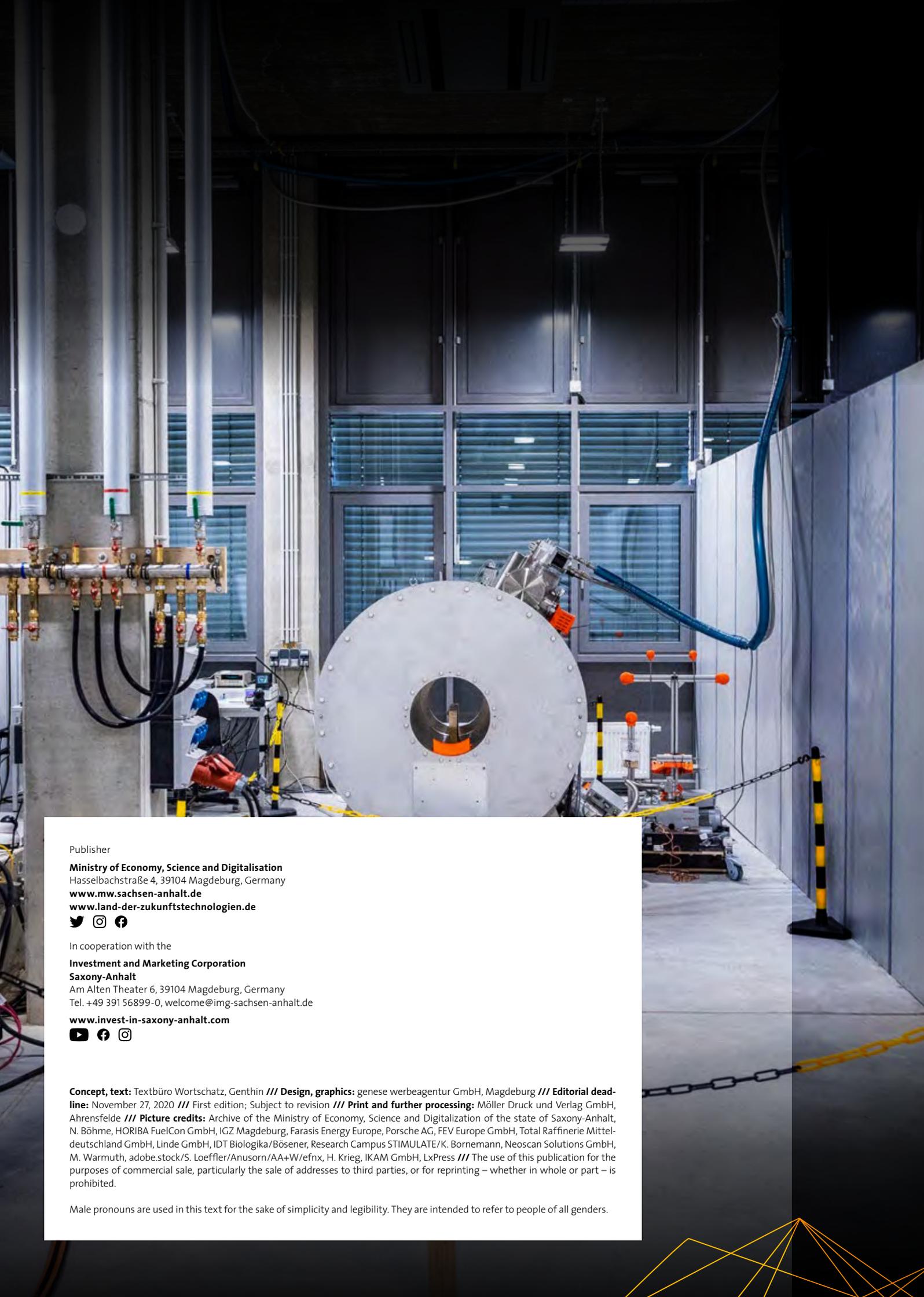
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SERVICE FOR SKILLED
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