REGIONAL INNOVATION STRATEGY
SACHSEN-ANHALT 2014 – 2020

SACHSEN-ANHALT

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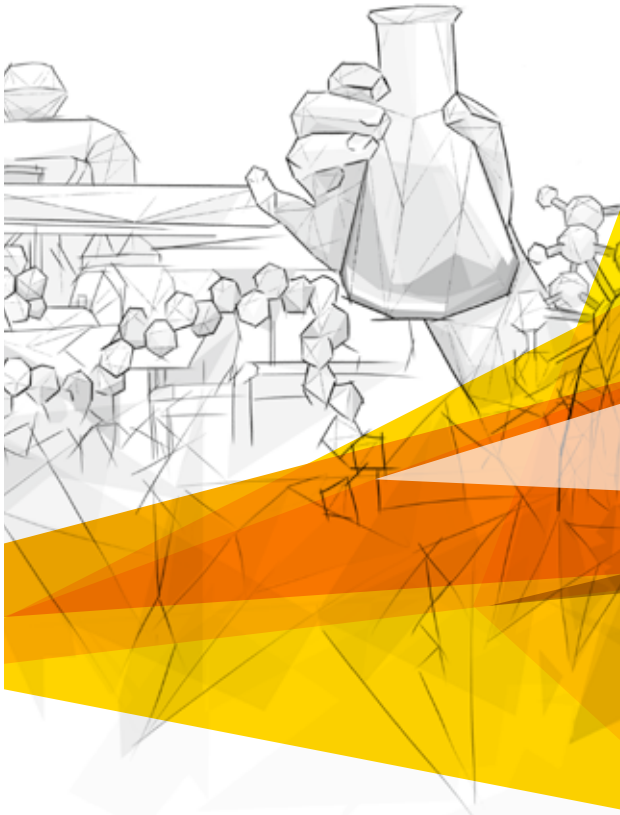
FUTURE IS STRATEGY.



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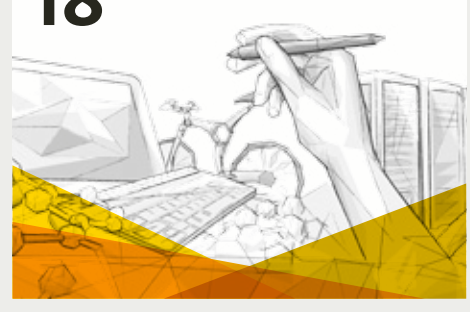
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Q&A

TWO SPECIALISTS ON THE STATE OF AFFAIRS: PROF. DR.-ING. SYLVIA ROHR AND MINISTER HARTMUT MÖLLRING

As the Minister of Sciences and Economic Affairs for the federal state of Sachsen-Anhalt, Hartmut Möllring is responsible for the "Regional Innovation Strategy". Prof. Dr.-Ing. Sylvia Rohr is considered to be a proven expert in innovations and their future development. She is the president of the Graduate School of Excellence advanced Manufacturing Engineering at the University of Stuttgart. Both met with journalist Miriam Fuchs.

What is the background of the Regional Innovation Strategy for the federal state of Sachsen-Anhalt?

Möllring: The economy in Sachsen-Anhalt, which is characterised by small and medium-sized enterprises, must be able to survive in competition in the future – on both a national and international level. Innovations, investments and internationalisation are essential conditions for more growth and the increase in the competitive ability of our native companies. We want to encourage innovations, focussed on both products and processes. This requires a good innovation environment within the state, which provides companies with the knowledge to improve company procedures and which can also transfer research findings from the scientific sector into innovations. A custom-fit strategy is needed to implement this.

What is special about the Innovation Strategy of Sachsen-Anhalt?

Möllring: This strategy has been developed jointly by representatives from the economy, science and politics. This means the recommendations from the strategy are not simply theory. They will serve as practice-oriented guidelines for the economic future of the state.

Rohr: In this way, the Innovative Strategy highlights the joint, specific objectives and the course of strategic action within the region. Taking into consideration regional traditions, existing strengths and patterns of specialisations together with the future challenges, it will increase the identification of individual innovators with the region and encourage their intensified collaboration. The strategy enables existing innovation barriers to be broken down, thus increasing the dynamism of innovation in the state.

"Innovation" sounds vaguely like "invention". How do you define this term?

Rohr: I define innovation as the economic dimension of investment in education as well as scientific and technical progress in connection with responsible business action. In fact, innovation is more than an invention or a new solution to a problem: It is a significant defining factor for competitive ability, added value and wealth.

Möllring: Such innovations can be initiated in all areas of life and must be considered as a whole. The term innovation stands for newness and modernisation in business and society and is not just something for technicians. The term is diverse. Innovations can include the further development of a product, the development of new distribution channels or market segments as well as creative marketing concepts and financing approaches. The use of the knowledge of others, i. e. knowledge transfer, can also lead to innovations.

Prof. Rohr, you work as an expert in networks and committees all over the country. What are the particular strengths of the people in Sachsen-Anhalt?

Rohr: Innovation is a very complex creative process which depends on many factors. This means its success is dependent on people. The people of Sachsen-Anhalt are characterised by their spirit and willingness to take risks and venture into new territories and to leave behind established routes. Their open-mindedness towards advanced technology, their creativity in searching for new solutions and their competence to integrate internal and external partners

Prof. Dr.-Ing. Sylvia Rohr, President of the Graduate School of Excellence advanced Manufacturing Engineering at the University of Stuttgart and Hartmut Möllring, Minister of Sciences and Economic Affairs of the state of Sachsen-Anhalt

from science and economy are an outstanding basis for the practical implementation of the Innovation Strategy.

From your point of view, what is particularly important for successfully implementing the Innovation Strategy?

Möllring: Sachsen-Anhalt exhibits a high degree of innovative potential in many subject fields. The state has innovative companies embedded in a functioning infrastructure. The task now is to boost the innovative ability of the state's companies, as this is still used too little. Even closer interlocking of economy and science is essential for this.

Rohr: The subject of innovation, as described above, must become even more important in the public sphere. Innovative capacity and the willingness to innovate must be characterised as the motivating vision. In particular, this includes a high-quality education, a modified culture of entrepreneurship and, for Sachsen-Anhalt, explicit promotion and support of existing SMEs.

What do you want from the companies based in the state?

Möllring: I hope that the close and trusting collaboration of business enterprises that we have seen to date across all industries is even further intensified. Through mutual support, shared developments and the effective synergies arising as a result, the business location of Sachsen-Anhalt can become an innovation leader in many sectors – throughout Germany and in Europe.

What headlines would you like to read in 2020 as a result of the consistent implementation of the Innovation Strategy?

Möllring: Sachsen-Anhalt's companies conquer the world: Innovative ideas, business knowledge and the highest quality from Sachsen-Anhalt impress!

Rohr: Innovative ability on broad shoulders – pioneering innovations from Sachsen-Anhalt secure the region a leading position in terms of company foundation and settlement in Europe.

REGIONAL INNOVATION STRATEGY SACHSEN-ANHALT 2014 – 2020

SACHSEN-ANHALT ON THE WAY TO BEING EUROPEAN INNOVATION LEADER – DEVELOPMENT OF STRENGTHS AND INNOVATION POTENTIALS FOR MORE ADDED VALUE

Sachsen-Anhalt has great potential to establish itself as an innovative research, science and business location in the heart of Europe in central future markets. Enhancing this potential is the focus of the Regional Innovation Strategy. As a result, sustainable, socially acceptable and environmentally friendly economic growth should be stimulated.

In an intensive dialogue with experts from the economy, science and politics, the location of the benefits of specialisation and competitive advantages of Sachsen-Anhalt were determined and trendsetting Lead Markets for the state were identified. Using existing advantages and, for example, developing them through a closer networking of science and economy is the objective of the Regional Innovation Strategy.

SOCIAL CHALLENGES AND MEGATRENDS

Social developments and changes set the framework for the economic dealings of the future. An ever-growing and aging global population, the increase in chronic illnesses and an increasing awareness of health place new demands on future-oriented healthcare and social services, demanding new answers. Climate change, the reduction of high CO_2 emissions and the scarcity of resources are challenging science and technology to develop new and integrated solutions.

Every megatrend, be it the demographic development, climate change or how to handle finite natural resources, also includes new economic opportunities for new products or procedures. To realise this, it is necessary to focus on the existing strengths, creativity and wealth of ideas of all the citizens of the state.

LEAD MARKETS

As part of the Regional Innovation Strategy, five leading and growth markets which are important for the state were identified on the basis of the core competences in the existing fields of science and economy in Sachsen-Anhalt and in view of the future global challenges. In these future markets, the state of Sachsen-Anhalt wants to encourage intelligent and socially integrative growth over the coming years in order to create competitive and high-quality work places in the state.

The Lead Markets with future potential in Sachsen-Anhalt are:

- Energy, Engineering and Plant Construction, Resource Efficiency
- Health and Medicine
- Mobility and Logistics
- Chemistry and Bioeconomy
- Food and Agriculture

THE GUIDELINES OF THE REGIONAL INNOVATION STRATEGY:

1. Intensification of the profile of the location of Sachsen-Anhalt through the focus of innovation policy on the Lead Markets, through high-quality settlements and the use of cluster and innovation networks.

2. Integration of innovations spanning the Lead Markets from the cross-sectional fields.

3. Reviving and developing innovation potentials in the company landscape and encouraging these through prospective transfers and low-threshold tenders.

4. Targeted development of the science location and professionalism of the transfer of knowledge and technology between research facilities and companies in order to achieve an innovative edge.

5. Development and more efficient use of local research infrastructure.

6. Improvement of the competitive advantage of existing production sites through investments and an associated increase in the existing innovation potential.

7. Strengthening of the company culture through wide-scale sensitisation in the education sector and the support of company foundations.

8. Securing of skilled workers in the state through investments in an effective education system, qualifications offered through day release from jobs, encouragement of young people and the development of childcare services.

9. Internationalisation of the innovation policy: integration of local production and services in international value added chains, reinforcement of export potentials through innovation, integration into international networks.

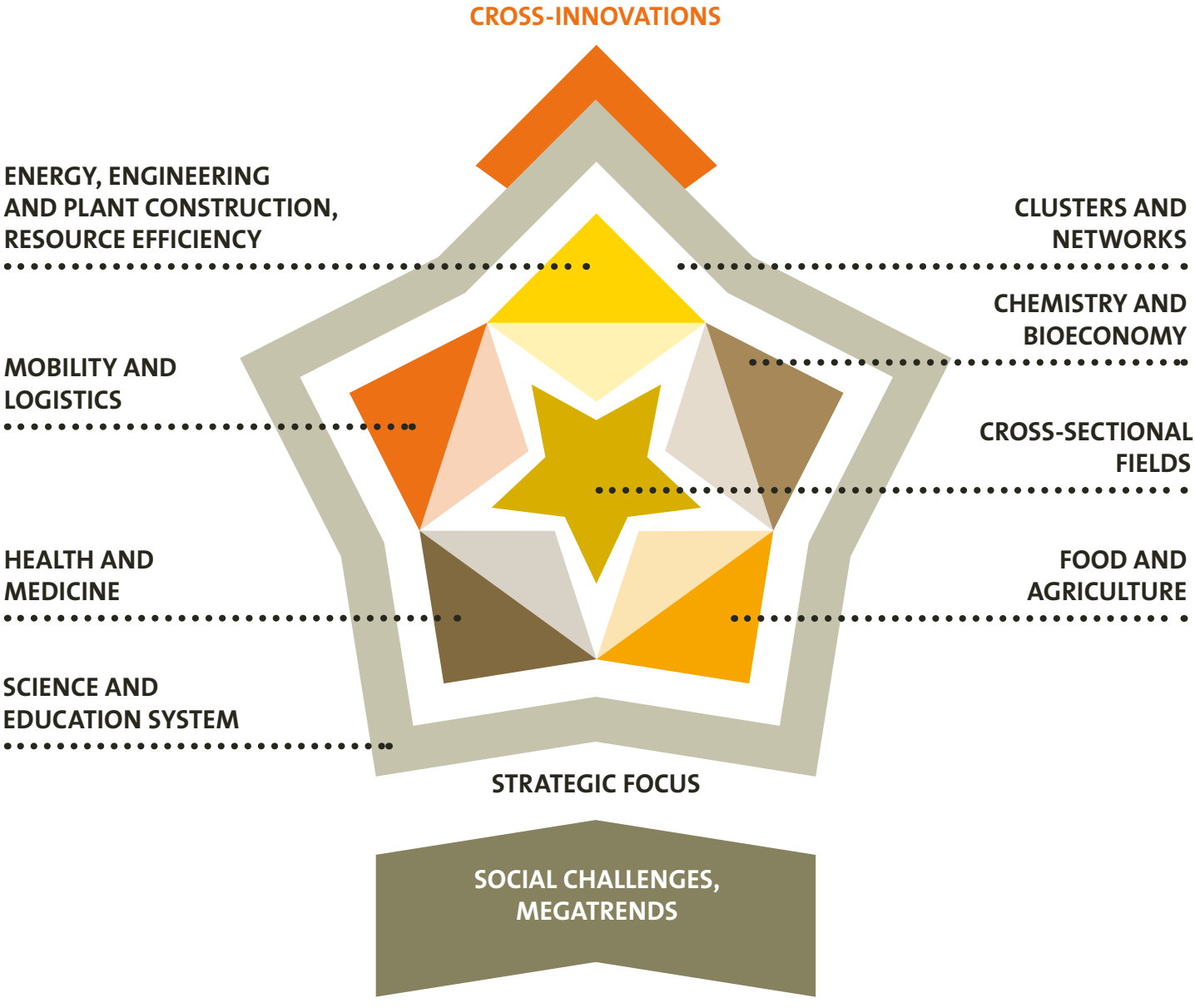
10. Consistent equal rights for women and men.

11. Consolidating financing methods: interdepartmental allocation of funds and reinforced acquisition of project subsidies from national and European funding programmes.

12. Continual further development and success monitoring of the Regional Innovation Strategy.

IMPLEMENTATION

The Regional Innovation Strategy is focused on a medium-term outlook. During its implementation, market trends, international developments and structural influences must be reacted to flexibly. To achieve the defined, demanding objectives and to occupy the position of an innovative science and business location in the identified Lead Markets worldwide, it is necessary to set priorities on themes and projects, which have particular relevance for innovative growth. Experts from the economy, science and politics will implement the objectives of the Regional Innovation Strategy through a close networking and intensive, continual collaboration.



The state of Sachsen-Anhalt will consistently align its funding policy with the Regional Innovation Strategy.

The needs-based further development of the strategy and the necessary success monitoring will be carried out by intradepartmental collaboration, by the Working Committees for Lead Markets and with the collaboration of the state's Advisory Council for Clusters and Innovations.

However, every individual will be needed to successfully implement the strategy. Participants from the economy, science, education and partners in associations and chambers are being asked to be actively involved in this development process.

The dynamism for an economic upswing can only be achieved from the existing strengths of the state.

ENERGY, ENGINEERING AND PLANT CONSTRUCTION, RESOURCE EFFICIENCY

SACHSEN-ANHALT AS A SYSTEM SUPPLIER FOR INTELLIGENT ENERGY AND RESOURCE MANAGEMENT

European and global climate protection requirements and the sustainable handling of dwindling resources provide the industry with new challenges. The production of regenerative energy must be marketable. Industrial production processes must run flexibly and with an efficient use of resources.

Sachsen-Anhalt is considered a leading federal state in the use of renewable energies and scores with an established advantage in technology when it comes to regenerative energy systems. In cooperation with intelligent uses of information and communication technology and innovative mechanical engineering, Sachsen-Anhalt offers pioneering system solutions.

The companies and research facilities in the state form a competence centre concerning generation, integration, storage and efficient use of energy. Along with the development of renewable energies, intelligent solutions for energy-optimised production processes are being developed. Through the infrastructural and systematic networking of energy production plants, production companies, recycling companies and service providers, pioneering Industry 4.0 (Advanced Manufacturing) models are being developed.

The "Run-of-River Power Technologyx Competence" network develops state-of-the-art hydroelectric power stations, even for flowing waters with slight inclines. Mobile systems allow electricity to be generated where it is needed, while taking into account environmental constraints.

Under the management of the Fraunhofer Institute for Factory Operation and Automation IFF Magdeburg, the ER-WIN Innovation Cluster is developing solutions for an intelligent, energy-efficient and resource-efficient regional value added chain in industry. The objectives are industrial parks, which enable more sustainable and economic production with energy-efficient structures and an intelligent networking of the companies settled on the site.

WIGRATEC+, a powerful alliance of companies and research facilities, maps the entire value added chain of fluidised bed and granulation technology. Sachsen-Anhalt emerges as a system leader here from the development to the construction and operation of fluidised bed plants. The development of automated fluidised bed procedures for process optimisation and quality assurance have international significance.

RENEWABLE ENERGY, SUSTAINABLE ENERGY PRODUCTION

- Wind turbines,
- Hydraulic power stations,
- Fuel cells, photovoltaic modules.

INTELLIGENT ENERGY DISTRIBUTION SYSTEMS (SMART ENERGY)

- Control and regulation systems,
- Electricity transmission, network control.

SMART PRODUCTION, INDUSTRY 4.0

- Factory and production design,
- Networking of productions, interlinking of production processes,
- Production logistics, production control.

PLANT AND MECHANICAL ENGINEERING

- Chemical appliance and device construction,
- Special machine construction, robotics systems,
- Heat generation and waste heat utilisation,
- Environmental systems, recycling,
- Transport and interlinking systems.

PROCESS DEVELOPMENT

- Fluidised bed technology,
- Ecological technologies, water and wastewater treatment.

EFFICIENT AND INTELLIGENT PRODUCTION TECHNIQUES

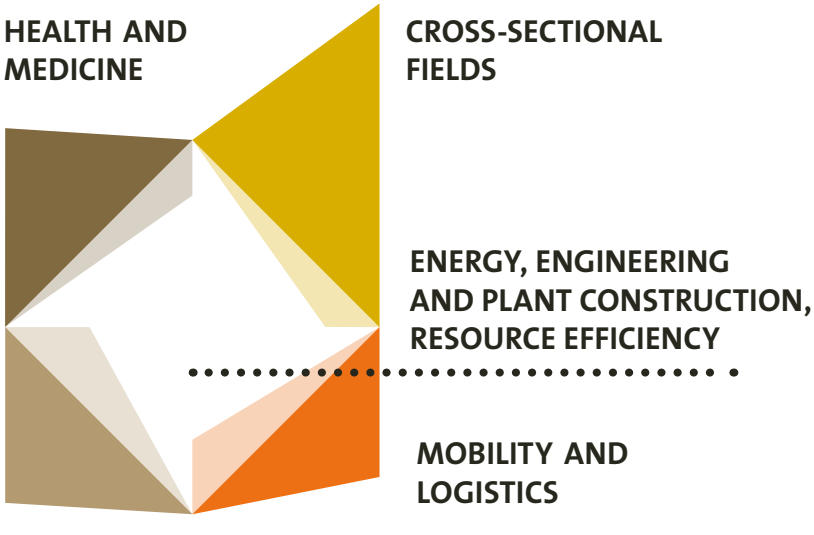
- Additive production techniques,
- Joining and connecting technologies (friction welding).

RESOURCE EFFICIENCY, CLOSED-LOOP ECONOMY

- Treatment and recycling of mixed waste and wastewater,
- Energy efficiency in production and process techniques,
- Lightweight construction design.

PROFILE OF SPECIALISATIONS

INTERLINKING OF THE LEAD MARKETS



VISION 2020

Through the systematic networking of regenerative energy technology, ultra-flexible production procedures and an environmentally-friendly closed-loop economy, Sachsen-Anhalt is gaining recognition on the global market. As a system support for resource-efficient and energy-efficient production, the expert knowledge from the research and economy of Sachsen-Anhalt is in demand throughout the world.

HEALTH AND MEDICINE

DEMOGRAPHIC CHANGE AS A DRIVER FOR INNOVATION IN SACHSEN-ANHALT

The health economy is one of the most important growth markets. Independent living in old age with a high level of quality of life is increasing in importance. Lifestyle, environmental and age-related diseases are providing medical technology, neurology and immunology with new challenges.

PROFILE OF SPECIALISATIONS

Sachsen-Anhalt's timely addressing of the challenges of demographic change is a significant national and international knowledge advantage. Independent, fulfilled living in old age in Sachsen-Anhalt is a future model.

In terms of the development and manufacture of innovative medical products, Sachsen-Anhalt is already one of the established locations. The research and development competences are in the fields of neurology, immunology, oncology, minimal-invasive diagnostics and treatment, biomedicine and the pharmaceutical and vaccine industries. In the state-wide medicine and healthcare technology cluster (Med-Tech), companies, associations, universities, research facilities and university hospitals work together. The aim is to strengthen the innovation capability in the field of health management and to promote the development of pioneering, medical products and procedures together with medical personnel.

INTERLINKING OF THE LEADING MARKETS

The STIMULATE research campus at the Otto von Guericke University in Magdeburg is a beacon in the research and development of imaging minimal-invasive diagnosis and treatment methods. The German Centre for Imaging Medicine (Deutsches Zentrum für bildgestützte Medizin) is being established in Sachsen-Anhalt.

As part of the "Autonomy in Old Age" (Autonomie im Alter) state project, countless products for neurosciences and medical research into aging are being supported. The focal points here are the human aging process, the early recognition of dementia, nursing, telemedicine, prevention and nutritional research and the emergence and treatment of widespread diseases. A model region for independent living in old age is being established in Sachsen-Anhalt.

NEUROLOGY, IMMUNOLOGY

- Behavioural research, early diagnosis of dementia,
- Molecular organisation of cellular communication in the immune system.

AUTONOMY IN OLD AGE

- Assistance system for independent living,
- Technology for cognitive technical systems.

MEDICAL TECHNOLOGY

- Imaging procedures in medicine,
- System biology, collection and analysis of bioelectrical signals,
- Active hearing,
- Interventional medical technology,
- Telemedicine.

BIOMEDICINE, PHARMACEUTICS, BIOPHARMACEUTICS

- Bioprotein chemistry,
- Development of active ingredients and medications.

THERAPEUTIC PLATFORM TECHNOLOGY

- Geriatrics,
- Development of therapeutic methods.

CROSS-SECTIONAL FIELDS

CLUSTER OF **SPECIAL-PURPOSE MACHINE AND PLANT CONSTRUCTION (SMAB – ROBOTICS)**

VISION 2020

Sachsen-Anhalt's medical research and technology is becoming an internationally recognised centre of competence for age-related illnesses and neurosciences. Models and structures for independent living in old age with a high quality of life are demanded on both a national and international level. New foundations and site expansions of medical technology and leading pharmaceutical companies are reinforcing Sachsen-Anhalt's position in the health market.

MOBILITY AND LOGISTICS

SACHSEN-ANHALT IS BRINGING DYNAMISM TO MOBILITY OF THE FUTURE

Increasing global demand for mobility, the resulting infrastructure bottlenecks, growing environmental pressures and dwindling oil deposits require innovative, pioneering traffic solutions. Energy-efficient, low-emission vehicles, manufacturing technology and intelligent, multimodal traffic systems will define the future market.

PROFILE OF SPECIALISATIONS

With its high-performance supplier industry for automobile manufacturing and its application-oriented research, Sachsen-Anhalt has the competence to develop sustainable solutions.

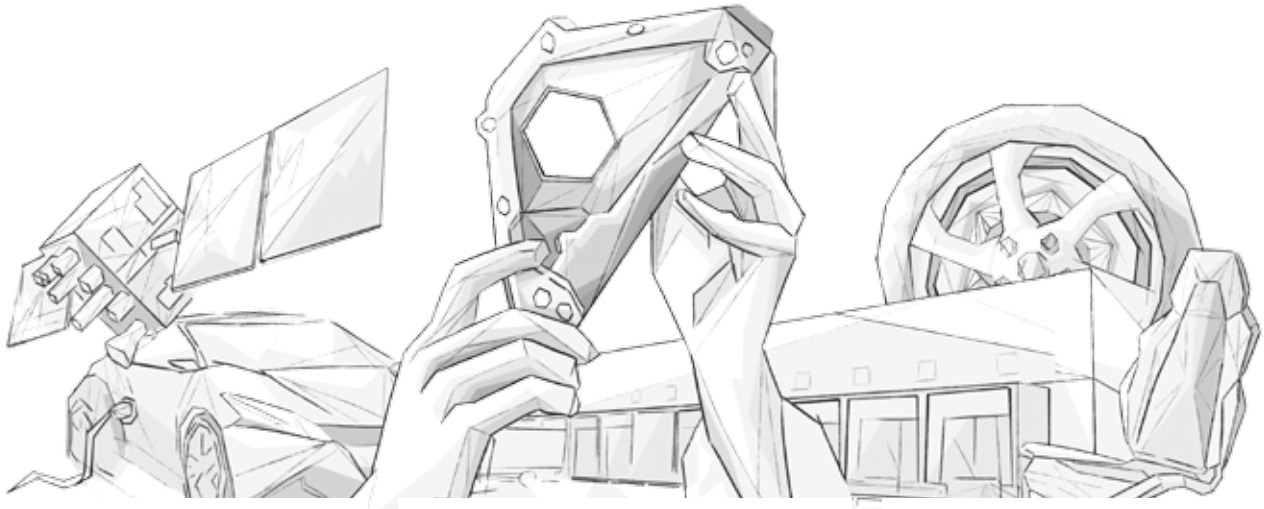
A piece of Sachsen-Anhalt is in every German-built car. With technical innovations in drive technology, aluminium and polymer-based lightweight components and in the field of e-mobility, Sachsen-Anhalt has established itself as a centre of competence for the automotive supply industry. Existing clusters, such as MAHREG Automotive and ELISA (Electromobility, light and intelligent – an initiative for Sachsen-Anhalt) cooperate with university and non-university research facilities to develop sustainable developments to production stage.

INTERLINKING OF THE LEADING MARKETS

An ultralight wheel hub motor for electric cars “Made in Sachsen-Anhalt” is the result of close cooperation between the Otto von Guericke University and its industrial partners as part of the Electromobility and Lightweight Construction state initiative. The project is a model for technical advancement due to Sachsen-Anhalt’s research competence.

The Institut für Kompetenz in AutoMobilität – IKAM GmbH in Magdeburg and Barleben is central to industry-oriented research and development in the automotive sector. Research fields include drive technology, e-mobility, lightweight construction and measurement and test engineering.

With the “Smart Mobile Energy” label, advances are being made on the automotive research focus and networking of various participants. Intelligent traffic systems are researched and developed to reorganise traffic efficiency and safety sustainably with the existing infrastructure.



SUSTAINABLE DRIVE CONCEPTS, DRIVE SECTIONS

- Combustion engines and gas engines, fuel cells,
- Wheel hub motors,
- Range extenders, energy management,
- Energy efficiency of drives.

ELECTROMOBILITY

- Contactless energy and data transmission,
- Energy management, power electronics,
- Infrastructure solutions.

LIGHTWEIGHT CONSTRUCTION, MINIATURISATION, NEW MATERIALS

- Lightweight construction design of drive sections, electrical drives, chassis frames,
- Aluminium casting, powder-metallurgical components,
- Hybrid and composite materials.

SAFETY AND COMMUNICATION TECHNOLOGY, TRAVELLING COMFORT

- Driver assistance systems, autonomous driving,
- Telematics systems for the vehicle.

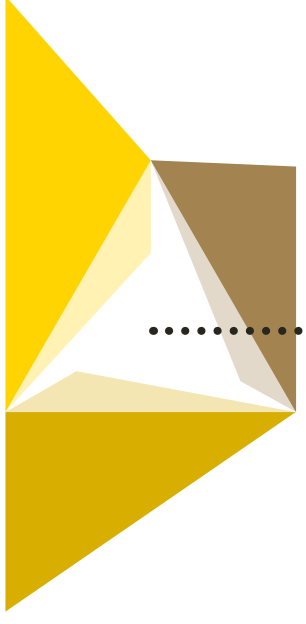
LOGISTICS

- Intelligent logistics in urban areas and stock turnover centres,
- Logistics in factories,
- Product and goods transportation.

INTELLIGENT TRAFFIC SYSTEMS, TRAFFIC CONCEPTS AND TELEMATICS

- Traffic development planning, traffic development, electromobility infrastructure,
- Traffic management, control and protection systems
- Social and ecological mobility concepts, life-long mobility,
- Traffic situation-dependent planning.

CLUSTER OF **SPECIAL-PURPOSE MACHINE AND PLANT CONSTRUCTION (ENERGY PLANT CONSTRUCTION)**



CHEMISTRY AND BIOECONOMY

MOBILITY AND LOGISTICS

CROSS-SECTIONAL FIELDS

VISION 2020

Suppliers of innovative and efficient drive technology from Sachsen-Anhalt are becoming the system suppliers of the global market. Practical intelligent logistics concepts and traffic systems are improving the traffic situation on the roads.

CHEMISTRY AND BIOECONOMY

NEW MATERIALS FROM SACHSEN-ANHALT FOR THE GLOBAL MARKETS

In times of dwindling fossil fuels and growing demands on environmental and climate protection, the chemicals and plastics industry must have a rethink. New highly-efficient, polymer-based lightweight materials define the future. The trend for resource-efficient and energy-efficient production processes is opening up new opportunities.

Sachsen-Anhalt has the necessary knowledge to find practicable solutions for these enormous global economic challenges.

From basic chemistry to the processing industry, the entire value added chain is already covered within the state. In the centre of Europe, a centre of competence in polymer manufacturing and processing has developed here over decades. Existing clusters and compound structures, effective university and non-university research and industry-oriented research infrastructures enable effective technology and knowledge transfer. As a result, theory is implemented efficiently in practice.

In the Fraunhofer Center for Chemical-Biotechnological Processes CBP in Leuna, crude oil replacements made from renewable materials are being researched. Biotechnical and chemical processes are transferred from laboratory results into production-relevant dimensions.

The aim of the HYPOS project is to create sustainable, clean and stable energy and raw material provision using “green” hydrogen. About 90 partners from all over Germany want to make it possible to store and stably use surplus renewable energy. Using intelligent interlinking of hydrogen production with existing infrastructure, such as gas storage and pipelines, hydrogen is becoming a significant building block of the energy turnaround and resource security.

PROFILE OF SPECIALISATIONS

INTERLINKING OF THE LEADING MARKETS

NEW POLYMER MATERIALS

Development and application of polymer-based lightweight materials

- Plastic processing, lightweight construction materials (CFK),
- Hybrid technologies, rubber chemistry, photovoltaics (plastics),
- Nanotechnology for surfaces.

BIOECONOMY

- Bio refineries, bio-plastics.

HYDROGEN ECONOMY

- H_2 as an energy carrier and resource (raw material for new products).

CARBON CHEMISTRY, CO_2 ECONOMY

- Material recycling of brown coal,
- Bio-coal, CO_2 as a raw material (algae).

FINE AND SPECIAL CHEMICALS

- Functional colourants,
- Catalysts,
- Products for the pharmaceutical, electronic and fine chemical industry.

CLUSTER **OF SPECIAL-PURPOSE MACHINE AND PLANT CONSTRUCTION (ENERGY PLANT CONSTRUCTION)**

HEALTH AND MEDICINE

CHEMISTRY AND BIOECONOMY

MOBILITY AND LOGISTICS

CLOSED LOOP RECYCLING MANAGEMENT AND RESOURCE MANAGEMENT CLUSTER

VISION 2020

Raw material diversity and market-compliant specialisation is opening up sustainable added value potentials for the chemistry and plastics industry. Sachsen-Anhalt's researchers and companies are creating an internationally recognised technological advantage. New materials from sustainable raw materials are being used all over the world. Sachsen-Anhalt is a principal and internationally visible site for the chemical industry and plastics processing.

FOOD AND AGRICULTURE

SACHSEN-ANHALT WITH A HIGH POTENTIAL FOR A PLANT-BASED ECONOMY

The effects of climate change, the demographic change and the decreasing agricultural land mean agriculture is facing major challenges. Plant cultivation, more productive farming methods and more effective use of all vegetable components offer the basis for a plant-based economy, which satisfies both the needs of the food industry and the raw materials supply for industry.

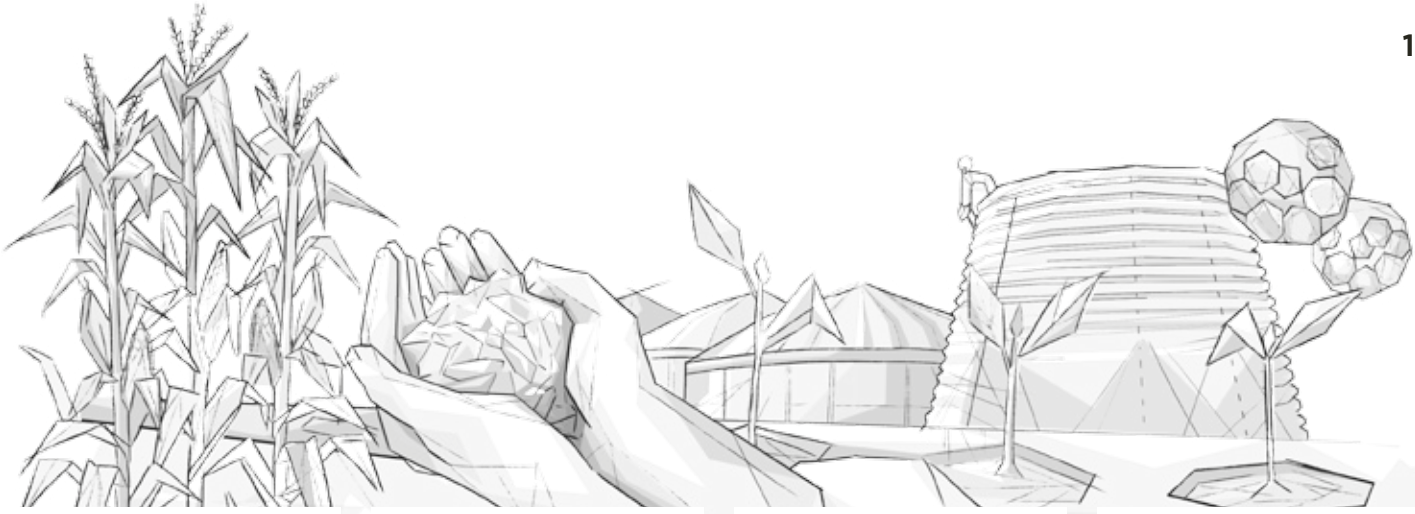
With more than a hundred years of experience in plant cultivation and state-of-the-art research facilities of bioeconomy and biotechnology, Sachsen-Anhalt is making a significant contribution in this regard.

The food industry is the industry with the highest turnover in Sachsen-Anhalt. Leading producers of frozen bakery products and ready-made bakery goods are among Sachsen-Anhalt's innovative companies in the food industry. Both product development, manufacturing and Germany and European logistics have contributed to creating more than 1,000 jobs.

In addition, plant cultivation and seed production, efficient food processing technology and modern production procedures form important components of a plant-based value added chain. University and non-university research facilities are developing new possible uses for plants and plant components for the food sector, the pharmaceutical and cosmetic industries and in order to supply raw materials to the industry.

The ScienceCampus – Plant-based Bioeconomy (WCH) in Halle includes the scientific disciplines of plant-based agricultural sciences, biology, biochemistry and biotechnology. Interdisciplinary research projects are implemented here and their practice use is supporting within the region.

The Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) in Gatersleben houses one of the largest gene banks for crops in the world. Around 150,000 seed stocks from over 3,000 crop species and almost 800 plant genres are preserved here and are available for research projects.



PLANT CULTIVATION AND FARMING, SEED PRODUCTION

- Crop cultivation,
- Energy crops.

FOOD TECHNOLOGY, PROCESS ENGINEERING, PRODUCT DEVELOPMENT

- Algae biotechnology,
- Vegetarian products.

BIOMASS ECONOMY, USAGE

- Biomass processing, plant biotechnologies,
- Protein synthesis from plants, e. g. rapeseed meal.

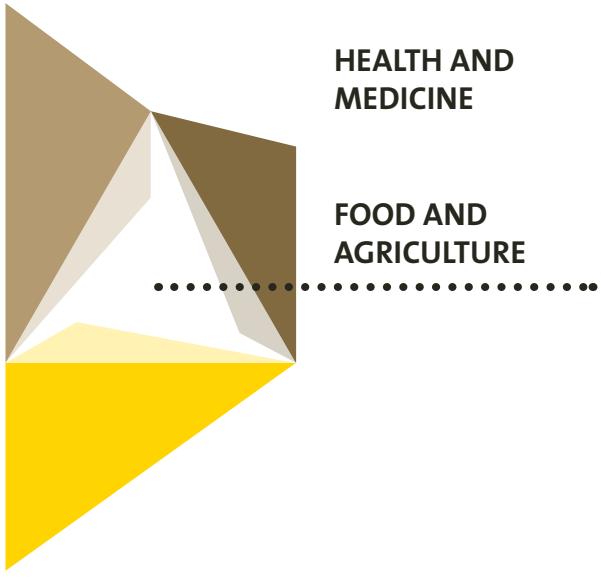
AGROCHEMISTRY

- Long-term fertilisers,
- Plant protection and nutritional strategies for various climatic conditions.

PROFILE OF SPECIALISATIONS

INTERLINKING OF THE LEAD MARKETS

CHEMISTRY AND BIOECONOMY



HEALTH AND MEDICINE

FOOD AND AGRICULTURE

CLUSTER **OF SPECIAL-PURPOSE MACHINE AND PLANT CONSTRUCTION (SMAB – ROBOTICS)**

VISION 2020

Robust, fertile plants and new plant-derived active ingredients from Sachsen-Anhalt are in national and international demand. Efficient food processing technologies are being used throughout the world. Due to the integral use of all plant components, new potentials for biomass use are also being developed.

INFORMATION AND COMMUNICATION TECHNOLOGIES, KEY TECHNOLOGIES, CREATIVE INDUSTRY

GROWTH STIMULI THROUGH THE INTEGRATION OF OVERLAPPING FIELDS OF INNOVATION: BITS, BYTES AND CREATIVITY

Accompanying the selected Lead Markets and as a fundamental component for successful innovation of all industries, three cross-sectional fields were defined for Sachsen-Anhalt. Information and Communication Technologies (ICT), Nanotechnology and Microtechnology which are among the Key Technologies and the Creative Industry assume fundamental key functions in research, development and production.

In the digital era, Information and Communication Technologies are the cornerstones for production improvements through optimised processes both for new and expanded business models, ultimately for cross-industry innovations. The state of Sachsen-Anhalt has become established as a recognised ICT location. Research and training centres, like the Universities Anhalt, Merseburg and Harz as well as the Martin Luther University of Halle-Wittenberg and the Otto von Guericke University of Magdeburg serve to ensure skilled personnel are secured within the state. Industry giants, such as IBM and T-Systems, are investing in new sites in Sachsen-Anhalt and benefiting from the proximity to universities of applied sciences and universities.

Application-oriented software “Made in Sachsen-Anhalt” is used in many pioneering industries. Efficient network technology, data security, mobile solutions and satellite-supported preparation and use of geodata are essential for technical developments.

High-tech stimuli for product and process innovations are provided through microsystem technology and nanotechnology. Based on these key technologies, innovation potentials can really be developed, for example in terms of plastics technology, the solar industry and energy storage.

Regional innovation projects find a spiritual source in the Creative Industry of Sachsen-Anhalt, just as the Creative Industry complements technical innovations with a high creative demand. With the internationally recognised Burg Giebichenstein University of Art and Design, the design-focussed courses at the Magdeburg-Stendal University of Applied Sciences and the Central German Multimedia Centre (Mitteldeutsches Multimedia zentrum) in Halle, Sachsen-Anhalt offers a high level of education for the next generation of creative professionals. The industrial design industry has the potential to develop into the leading branch of the Creative Industry in the state. For this reason, cooperative relationships between industry and the Creative Industry form an important component for innovation processes and are supported accordingly.

INFORMATION AND COMMUNICATION TECHNOLOGIES

- Embedded systems and their networking (Internet of Things),
- Communication technologies, communicating production systems,
- Security of IT systems, databases, information systems and analyses,
- Computer systems in the engineering sector, software engineering,
- Real-time applications for mobility.

CREATIVE INDUSTRY

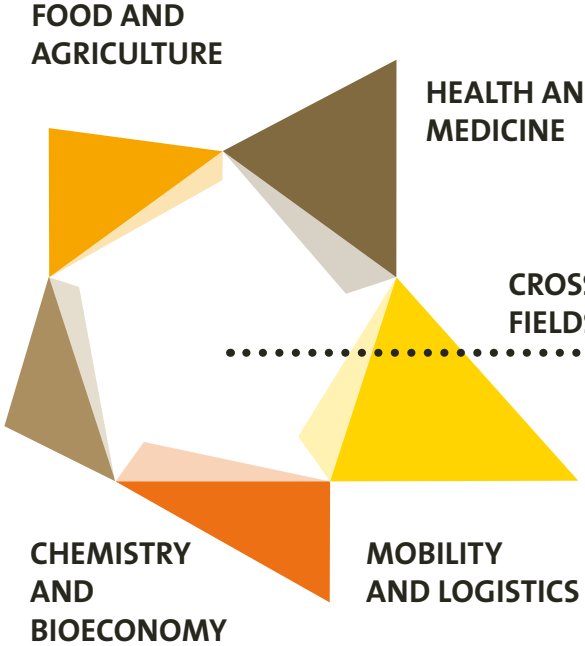
- Design, functional industrial design,
- Visualisation, multimedia applications.

NANOTECHNOLOGY, MICROSYSTEM TECHNOLOGY

- Three-dimensional support systems,
- Nano-structured materials (surfaces),
- Assembly and connection engineering in microsystem technology.

PROFILE OF SPECIALISATIONS

INTERLINKING OF LEAD MARKETS



CLUSTER OF **SPECIAL-PURPOSE MACHINE AND PLANT CONSTRUCTION (ENERGY PLANT CONSTRUCTION)**

VISION 2020

The intensive cross-industry networking of Lead Markets with Information and Communication Technologies, the Key Technologies and the Creative Industry increases the productivity and added value of Sachsen-Anhalt.

RESEARCH PROFILE OF SACHSEN-ANHALT

COMPETENCE FOR MORE INNOVATIONS IN SACHSEN-ANHALT

The targeted expansion of the scientific location of Sachsen-Anhalt, the professionalization of the knowledge and technology transfer and securing the supply of specialised workers are the guidelines of the Regional Innovation Strategy. As a result, the scientific system is a basis for making an effective contribution to increasing innovation in the state throughout the entire value added chain.

The universities and non-university research facilities of the state form the central scientific infrastructure in Sachsen-Anhalt. The task of the universities is to link teaching, research, further education and the support of the next generation of scientific specialists together. Research at the universities and universities of applied sciences is application-oriented and closely connected with the transfer of technology. In addition, fundamental research is carried out at the universities.

The research of the universities and universities of applied sciences is complemented by non-university research facilities. Specifically, these are the five research facilities of the Leibniz Association (WGL), three Max Planck Institutes (MPI), five Fraunhofer Research Institutes and two Helmholtz Centres (HGF). They are each dedicated to fundamental research or application-oriented research, as per their specific profile. **The most important research focuses in Sachsen-Anhalt include:**

- Economic sciences and agricultural economics,
- Neurology and neuro-degenerative diseases,
- Systemic environmental research,
- Material sciences and microsystem technology,
- Logistics and mobility,
- Energy research,
- Health and medical engineering,
- Plant biology and biotechnology,
- Investigation of social change processes, ethnology.

The close cooperations with scientific facilities and the state's SMEs are outstanding in all sectors. In this way, practical components are always specifically incorporated into research works. Joint research projects ensure an effective and application-oriented transfer of knowledge and technology. Effective cooperations develop pioneering developments through to production line status.

RESEARCH FOCUSES OF THE UNIVERSITIES *

The range of courses on offer at the **MARTIN LUTHER UNIVERSITY OF HALLE-WITTENBERG** include the wide classic curriculum of natural sciences and the humanities. The research profile includes, specifically, the disciplines of biosciences, material sciences, humanities, medicine, pharmaceutics and agriculture sciences. Parts of engineering have been integrated into the focus areas of material and biosciences. The two molecular medicine research profile areas of signal transduction and "epidemiology and nursing research" innovatively cover the fields of biomedicine, epidemiology and health services research. Stimuli are also expected from the National Cohorts which are being developed and the regional registry of myocardial infarction.

Important, cross-regional research priorities at the Martin Luther University are, for example:

- Nanostructured materials, material sciences,
- Biosciences and plant research, structures and mechanisms of biological information processing,
- Society and culture in motion, oriental studies,
- "Enlightenment – religion – knowledge, transformation of the devout and rational into the modern era", humanities.

Due to the concentrated development of research priorities, a series of key appointments have succeeded in contributing to the national and international visibility of research. This includes the joint appointment with the Max Planck Institute for Microstructure Physics for the field of experimental physics, for example, from which important stimuli from the field of data storage technology have emerged.

Protein research in Halle has been able to build on its strong position and attract outstanding scientists with new appointments in the field of bioprotein chemistry. The future protein centre will continue to advance existing cooperations with non-university facilities.

Another focus at the Martin Luther University of Halle-Wittenberg is plant research, including the use of results in the process of innovation. The University is developing efficient cooperation structures together with efficient non-university research facilities with the Leibniz ScienceCampus on "plant-based bioeconomy", which was founded in 2011.

*** Selection related to the Lead Markets of the Regional Innovation Strategy**

The Interdisciplinary Centre for Crop Research is also integrated into this. With the establishment of the German Centre for Integrative Biodiversity Research (iDiv) of Leipzig-Halle-Jena, another significant platform is being developed for technology transfer, which facilities cross-state and cross-institute collaboration of the universities in Halle, Jena and Leipzig.

Research priorities focussed on the Lead Markets at the Martin Luther University of Halle-Wittenberg are predominantly in the sectors of:

- Health and Medicine,
- Chemistry and Bioeconomy,
- Food and Agriculture,
- Information and Communication Technology.

The **OTTO VON GUERICKE UNIVERSITY OF MAGDEBURG** focuses on engineering and natural sciences as well as medicine, complemented by economic competence. The faculties for mechanical engineering, electrotechnology and information technology, procedural and system engineering, information sciences and mathematics are the heart of the technical emphasis. Neurosciences and immunology form the focus of the medical faculty.

The effective research priorities of the university with a particular national and international appeal are organised into the following research centres:

- Center for Behavioral Brain Sciences, neurosciences,
- Dynamic systems in biomedicine and process engineering, system biology.

The programme of research priorities below are particularly important as part of the Regional Innovation Strategy:

- Central issues of brain function and behavioural research,
- Infection and immunology research,
- causal role of brain oscillations for perception processes,
- particles in contact – micromechanics, microprocess dynamics and particle collectives,
- Dynamic simulation of networked solid processes (DynSim-FP).

To connect the application-oriented basic research with the transfer of knowledge and technology, engineering funding priorities were specifically created. This includes dynamic systems in biomedicine and process engineering, renewable energies, automotive, microsystem technology, medical engineering and fluidised bed technologies.

Through intensive collaboration with humanities, social sciences and educational science, the focuses on engineering and natural sciences are linked with socially relevant aspects. This creates important stimuli for science and the economy with regards to education and socially-relevant and ethical issues. The arising research campus "STIMULATE" (Solution Center for Image Guides Local Therapies) is a substantial project in the Lead Market of "Health and Medicine".

The partners of the research campus have set themselves the aim of further developing imaging minimal-invasive treatments and tools, thus contributing to improving treatment methods, the quality of life for patients and the cost situation in healthcare.

Research priorities focussed on the lead markets at the Otto von Guericke University of Magdeburg are established in the following sectors in particular:

- Health and Medicine,
- Energy, Engineering and Plant Construction, Resource Efficiency,
- Mobility and Logistics,
- Chemistry and Bioeconomy.

The **UNIVERSITIES OF APPLIED SCIENCES** have reached an agreement as part of the Competence Network for Applied and Transfer-Oriented Research (KAT) on networking in issues of knowledge and technology transfer based on the following profiling of scientific centres of competence:

- University of Applied Sciences of Anhalt – Life Sciences,
- University of Applied Sciences of Harz – Information and communication technologies and services,
- University of Applied Sciences of Magdeburg-Stendal – engineering sciences, renewable resources,
- University of Applied Sciences of Merseburg – natural sciences, chemistry, plastics.

These centres of competence and the affiliated innovation laboratories offer a performance profile which makes it possible to secure external funding to a larger degree in cooperation with SMEs and network partners. The partners in KAT support the strengthening of corporate culture and the promotion of foundations in the sense of the Regional Innovation Strategy through direct contact with SMEs. Companies are increasingly motivated to use the knowledge and technology offered by universities for application-related research and development in order to sustainably improve their market position. The need for low-threshold technology transfer can be increasingly better identified and used.

The Burg Giebichenstein University of Art and Design in Halle is an effective partner for the creative industry with its field of specialism in design. It provides research and training for broad use in all fields of the economy, particularly in the fields of industrial design, communication design and multimedia/VR designs.

Research priorities focussed on the leading markets at the universities of applied sciences are concentrated into the following fields:

- Energy, Engineering and Plant Construction, Resource Efficiency,
- Health and Medicine,
- Chemistry and bioeconomy,
- Food and Agriculture,
- Cross-sectional fields of Information and Communication Technology and the Creative Industry.

The innovation portal at www.innovation-sachsen-anhalt.de provides detailed information about the research landscape of the state.

CONTACTS

LEAD MARKET OF **ENERGY, ENGINEERING AND PLANT CONSTRUCTION, RESOURCE EFFICIENCY**

COMPETENCE FIELDS

- **Renewable energies, sustainable energy production**
- **Intelligent energy distribution systems (smart energy)**
- **Energy storage**
- **Plant construction**
- **Mechanical construction**
- **Robotics**
- **Process development**
- **Closed-loop economy, recycling**
- **Resource efficiency**

UNIVERSITIES AND NON-UNIVERSITY RESEARCH FACILITIES

- Otto von Guericke University of Magdeburg (OvGU), Faculty of Process and Systems Engineering, Faculty of Mechanical Engineering, Faculty of Instrumental and Environmental Technology, Institute of Electric Power Systems – Chair Electric Power Networks and Renewable Energy, Faculty of Electrical Engineering and Information Technology, **www.vst.ovgu.de, www.fmb.ovgu.de, www.fvst.ovgu.de/iaut.html, www.iesy.ovgu.de, www.ovgu.de/lena, www.eit.ovgu.de**
- Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, **www.mpi-magdeburg.mpg.de**
- Martin Luther University of Halle-Wittenberg (MLU), Institute of Chemistry, Technical Chemistry, **www.chemie.uni-halle.de/bereiche_der_chemie/technische_chemie**
- Magdeburg-Stendal University of Applied Sciences, Institute for Mechanical Engineering, **www.hs-magdeburg.de/hochschule/fachbereiche/iwid/institut-fuer-maschinenbau**
- KAT-Competence Center for Engineering Sciences/Renewable Resources (HS Magdeburg-Stendal), **www.hs-magdeburg.de/forschung/kompetenzzentren/kat-kompetenzzentrum**
- Anhalt University of Applied Sciences, **www.hs-anhalt.de**
- Fraunhofer Institute for Factory Operation and Automation IFF, Magdeburg, **www.iff.fraunhofer.de**

TRANSFER AND RESEARCH INFRA-STRUCTURES

- ZPVP GmbH (ExFa) Magdeburg, **www.exfa.de**
- Fraunhofer Center for Silicon Photovoltaics CSP, Halle and Schkopau, **www.csp.fraunhofer.de**
- Institute for Competence in Auto Mobility – IKAM GmbH of the OvGU, **www.ikam-md.de**
- Zere e.V. Magdeburg, **www.zere-ev.de**
- KAT-Competence Center for Engineering Sciences/Renewable Resources (HS Magdeburg-Stendal), **www.hs-magdeburg.de/forschung/kompetenzzentren/kat-kompetenzzentrum**
- Helmholtz Centre for Environmental Research – UFZ, Leipzig-Halle, **www.ufz.de**

LEAD MARKET OF **HEALTH AND MEDICINE**

COMPETENCE FIELDS

- **Neurology, immunology**
- **Autonomy in old age**
- **Medical engineering**
- **Biomedicine, pharmaceutics, biopharmaceutics**
- **Therapeutic platform technologies**

UNIVERSITIES AND NON-UNIVERSITY RESEARCH FACILITIES

- Otto von Guericke University of Magdeburg (OvGU), Medical Faculty, Faculty of Process and Systems Engineering, Faculty of Mechanical Engineering, **www.med.uni-magdeburg.de, www.vst.ovgu.de, www.fmb.ovgu.de**
- Martin Luther University of Halle-Wittenberg (MLU), Medical Faculty and Faculty of Natural Sciences, **www.medizin.uni-halle.de, www.natfak1.uni-halle.de**
- Leibniz Institute for Neurobiology Magdeburg (LIN), **www.lin-magdeburg.de**
- Max Planck Institute for Dynamics of Complex Technical Systems Magdeburg (MPI), **www.mpi-magdeburg.mpg.de**
- Hochschule Harz – University of Applied Studies and Research, **www.hs-harz.de**
- Anhalt University of Applied Sciences, **www.hs-anhalt.de**
- Magdeburg-Stendal University of Applied Sciences, **www.hs-magdeburg.de**
- German Center for Neurodegenerative Diseases (DZNE), Magdeburg, **www.dzne.de/standorte/magdeburg**
- Leibniz Institute of Plant Biochemistry (IPB), Halle, **www.ipb-halle.de**
- Fraunhofer Institute for Mechanics of Materials IWM, Halle, **www.iwm.fraunhofer.de**
- Fraunhofer Institute for Cell Therapy and Immunology IZI, Halle (Saale) Branch, Department of Drug Design and Target Validation, **www.izi.fraunhofer.de/projektgruppemolekulare-wirkstoff-biochemie-und-therapieentwicklung.html**

TRANSFER AND RESEARCH IN-FRASTRUCTURES

- Center for Behavioral Brain Sciences, OvGU, (LIN/DZNE), **www.cbbs.eu**
- Center for Dynamic Systems, OvGU, MPI, **www.cds.ovgu.de**
- Health Campus for Immunology, Infectiology and Inflammation, OvGU
- "STIMULATE" Research Campus, OvGU, **www.forschungscampus-stimulate.de**
- Centre for Neuroscientific Innovation and Technology ZENIT GmbH, Magdeburg, **www.zenit-magdeburg.de**
- Biozentrum Halle, **www.biozentrum.uni-halle.de**
- Inno-Life Innovation and New Business Centre, Schönebeck, **www.igz-inno-life.de**
- KAT-Competence Centre of Life Science (HS Anhalt), **www.hs-anhalt.de/forschung/kompetenznetzwerk/kompetenzzentrum-life-sciences**
- Centre for Innovation Competence "HALOmem membrane protein structure dynamics" (MLU), **www.halomem.de**
- Profie Centre for Health Sciences (PZG), MLU, **www.medizin.uni-halle.de//index.php?id=3679**
- Interdisciplinary Centre for Aging Halle (IZAH), MLU, **www.izah.uni-halle.de**
- Institut für Medizin & Technik e.V. (institute for medicine and technology), Anhalt University of Applied Sciences, **www.nano-naro-polymer-products.de/IMT**
- ppm Pilot Pflanzentechnologie Magdeburg e.V., Pilot Plant Centre for Crop Technology and Protein Synthesis, **www.ppm-magdeburg.de**
- BioPharmaPark Dessau, **www.biopharmapark.de**

LEAD MARKET OF **MOBILITY AND LOGISTICS**

COMPETENCE FIELDS

- **Sustainability of drive concepts**
- **Mechatronics, drive sections**
- **Electromobility**
- **Contactless energy and data transfer**
- **Lightweight construction, miniaturisation**
- **New materials (aluminium, hybrid and composite materials)**
- **Safety and communication technology, driving comfort**
- **Efficient and intelligent production techniques**
- **Intelligent traffic systems (ITS)**
- **Mobility concepts**
- **Logistics**
- **Traffic telematics**

UNIVERSITIES AND NON-UNIVERSITY RESEARCH FACILITIES

- Otto von Guericke University of Magdeburg (OvGU): Faculty of Process and Systems Engineering, Faculty of Mechanical Engineering, Institute of Logistics and Material Handling Systems, Faculty of Electrical Engineering and Information Technology, Faculty of Computer Science, **www.vst.ovgu.de, www.fmb.ovgu.de, www.ilm.ovgu.de, www.iesy.ovgu.de, www.eit.ovgu.de, www.cs.uni-magdeburg.de**
- Hochschule Harz – University of Applied Studies and Research, **www.hs-harz.de**
- Magdeburg-Stendal University of Applied Sciences, **www.hs-magdeburg.de**
- Max Planck Institute for Dynamics of Complex Technical Systems Magdeburg, **www.mpi-magdeburg.mpg.de**
- Fraunhofer Institute for Factory Operation and Automation IFF, Magdeburg, **www.iff.fraunhofer.de**
- Anhalt University of Applied Sciences, **www.hs-anhalt.de**
- Merseburg University of Applied Sciences, **www.hs-merseburg.de**

TRANSFER AND RESEARCH INFRA-STRUCTURES

- Competence in Mobility Network (COMO) – OvGU, Drive Train Test Bench for Vehicles, Motor Test Stands, Complex Engine Test Bench, Wheel Measuring Systems, CV Joints Test Bench, Vibroacoustic Laboratory, Laboratory for Electromagnetic Compatibility, **www.automotive.ovgu.de/Projekte/Competence+in+Mobility/COMO+II, www.emv.ovgu.de**
- Institute for Competence in Auto Mobility GmbH (IKAM), OvGU, **www.ikam-md.de**
- Institut für Automation und Kommunikation e.V. (ifak – Institute for Automation and Communication), Magdeburg, **www.ifak.eu**
- WTZ Roßlau gGmbH, **www.wtz.de**
- Industrial Laboratory for Function-Optimised Lightweight Components, Magdeburg-Stendal University of Applied Sciences, **www.funktionsoptimierter-leichtbau.de**
- Polymer Competence Centre Merseburg (KKZ), **www.kkz-halle-merseburg.de**
- Fraunhofer Pilot Plant Centre for Polymer Synthesis and Processing (PAZ), Schkopau, **www.polymer-pilotanlagen.de**
- Fuel Cell Laboratory and Test Benches and Battery Test Benches, OvGU, **www.feit.ovgu.de**
- Test Field for GALILEO Transport Sachsen-Anhalt, **www.galileo.ovgu.de**
- Mobility Data Marketplace (MDM), **www.mdm-portal.de**

LEAD MARKET OF **CHEMISTRY AND BIOECONOMY**

COMPETENCE FIELDS

- **New polymer materials – development and use of polymer-based lightweight materials for mobility, energy, medicine**
- **Bioeconomy**
- **Carbon chemistry, CO_2 economy**
- **Hydrogen economy**
- **Fine chemistry**

UNIVERSITIES AND NON-UNIVERSITY RESEARCH FACILITIES

- Martin Luther University of Halle-Wittenberg (MLU), Chair of Polymer Technology, Faculty of Natural Sciences I und III, **www.kunststofftechnik.uni-halle.de, www.natfak1.uni-halle.de, www.natfak3.uni-halle.de**
- Otto von Guericke University of Magdeburg (OvGU), Faculty of Process and Systems Engineering, Faculty of Instrumental and Environmental Technology, Faculty of Mechanical Engineering, **www.vst.ovgu.de, www.fvst.ovgu.de/iaut.html, www.fmb.ovgu.de**
- Fraunhofer Institute for Mechanics of Materials IWM, **www.iwm.fraunhofer.de**
- Max Planck Institute for Dynamics of Complex Technical Systems Magdeburg, **www.mpi-magdeburg.mpg.de**
- Merseburg University of Applied Sciences, **www.hs-merseburg.de**
- Anhalt University of Applied Sciences, **www.hs-anhalt.de**
- Magdeburg-Stendal University of Applied Sciences, **www.hs-magdeburg.de**
- Leibniz Institute of Plant Biochemistry, Halle, **www.ipb-halle.de**

TRANSFER AND RESEARCH INFRA-STRUCTURES

- Fraunhofer Pilot Plant Centre for Polymer Synthesis and Processing PAZ, Schkopau, **www.iap.fraunhofer.de/de/Forschungsbereiche/Pilotanlagenzentrum_Schkopau**
- Fraunhofer Center for Chemical-Biotechnological Processes CBP, Leuna, **www.cbp.fraunhofer.de**
- Biozentrum Halle, **www.biozentrum.uni-halle.de**
- KAT Competence Centre for Natural Sciences, Chemistry/Polymers, **kat.hs-harz.de/index.php?id=63**
- Polymer Competence Centre Halle-Merseburg KKZ, **www.kkz-halle-merseburg.de**
- ppm Pilot Pflanzenöltechnologie Magdeburg e.V., Pilot Plant Centre for Crop Technology and Protein Synthesis, **www.ppm-magdeburg.de**
- Helmholtz Centre for Environmental Research – UFZ, Leipzig-Halle, **www.ufz.de**
- ScienceCampus – "Plant-based Bioeconomy", **www.sciencecampus-halle.de**
- ZSG Zeitzer Standortgesellschaft mbH, **www.industriepark-zeitz.com**
- Chemiepark Bitterfeld-Wolfen GmbH, **www.chemiepark.de**
- InfraLeuna GmbH, **www.infraleuna.de**
- Dow Olefinverbund GmbH Schkopau, **www.dow.com/valuepark**

LEAD MARKET OF **FOOD AND AGRICULTURE**

COMPETENCE FIELDS

- **Food technology, process technology**
- **Food product development**
- **Plant cultivation, seed collection**
- **Protein recovery**
- **Biomass economy, usage**
- **Agrochemistry**

UNIVERSITIES AND NON-UNIVERSITY RESEARCH FACILITIES

- Martin Luther University of Halle-Wittenberg (MLU), Institute of Agricultural and Nutritional Sciences, Faculty of Natural Sciences I and III, **www.landw.uni-halle.de**
- Anhalt University of Applied Sciences, Faculty of Applied Biosciences and Process Engineering – Food Process Engineering, **www.bwp.hs-anhalt.de/forschung**
- Otto von Guericke University of Magdeburg (OvGU), Faculty of Process and Systems Engineering, Faculty of Instrumental and Environmental Technology, Faculty of Mechanical Engineering, **www.vst.ovgu.de, www.iaut.ovgu.de, www.fmb.ovgu.de**
- Magdeburg-Stendal University of Applied Sciences, **www.hs-magdeburg.de**
- Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, **www.ipk-gatersleben.de**
- Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle, **www.iamo.de**
- Leibniz Institute of Plant Biochemistry Halle, **www.ipb-halle.de**

TRANSFER AND RESEARCH INFRA-STRUCTURES

- Helmholtz Centre for Environmental Research - UFZ – UFZ, Leipzig-Halle, **www.ufz.de**
- Agrochemisches Institut Piesteritz e.V. (AIP – the Piesteritz Agrochemical Institute), **www.aip.uni-halle.de**
- Biozentrum Halle, **www.biozentrum.uni-halle.de**
- European Wheat Cultivation Centre Bayer CropScience Gatersleben, **www.bgi-gatersleben.de, www.agrar.bayer.de**
- Leibniz ScienceCampus – "Plant-based Bioeconomy", **www.sciencecampus-halle.de**
- ppm Pilot Pflanzenöltechnologie Magdeburg e.V., Pilot Plant Centre for Crop Technology and Protein Synthesis, **www.ppm-magdeburg.de**
- BGI Biotechpark Gatersleben Infrastrukturgesellschaft mbH, **www.bgi-gatersleben.de**
- Ex-situ Genebank for Crops of the IPK Gatersleben, **www.ipk-gatersleben.de**
- German Plant Phenotyping Network (DPPN), Gatersleben site, www.dppn.de, **www.ipk-gatersleben.de**
- German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, **www.idiv-biodiversity.de**
- Green Gate Gatersleben, **www.green-gate-gatersleben.de**
- KAT – Center of Life Sciences, Köthen, **www.hs-anhalt.de/forschung/kompetenznetzwerk/kompetenzzentrum-life-sciences**
- Biosolar Centre Köthen, **www.gicon.de, www.hs-anhalt.de**

CROSS-SECTIONAL FIELDS

COMPETENCE FIELDS

- **Information and communication technologies**
- **Computer sciences, robotics**
- **Smart Production, Industry 4.0 (Advanced Manufacturing)**
- **Creative industry**
- **Automation technology**
- **Nanotechnology, microsystem technology**
- **Humanities and social sciences**

UNIVERSITIES AND NON-UNIVERSITY RESEARCH FACILITIES

- Otto von Guericke University of Magdeburg (OvGU: Faculty of Computer Science, Faculty of Electrical Engineering and Information Technology, Faculty of Mechanical Engineering, Institute of Logistics and Material Handling Systems (ILM), Faculty of Humanities, **www.cs.uni-magdeburg.de, www.eit.ovgu.de, www.fmb.ovgu.de; www.ilm.ovgu.de; www.uni-magdeburg.de/fgse**
- Martin Luther University of Halle-Wittenberg (MLU), Institute for Environmental Toxicology, Institute for Physics, Philosophical Faculty, **www.medizin.uni-halle.de; www.physik.uni-halle.de; www.philfak.uni-halle.de**
- Max Planck Institute of Microstructure Physics, **www.mpi-halle.mpg.de**
- Fraunhofer Institute for Mechanics of Materials IWM, Halle, **www.iwm.fraunhofer.de**
- Fraunhofer Institute for Factory Operation and Automation IFF, Magdeburg, **www.iff.fraunhofer.de**
- Burg Giebichenstein University of Art and Design Halle, **www.burg-halle.de**
- Magdeburg-Stendal University of Applied Sciences; Institut für Industrial Design, **www.hs-magdeburg.de/hochschule/fachbereiche/iwid/institut-fuer-industrial-design**
- Max Planck Institute for Dynamics of Complex Technical Systems Magdeburg, **www.mpi-magdeburg.mpg.de**
- Magdeburg-Stendal University of Applied Sciences, **www.hs-magdeburg.de**
- Anhalt University of Applied Sciences, **www.hs-anhalt.de**

TRANSFER AND RESEARCH INFRA-STRUCTURES

- Institut für Automation und Kommunikation e.V. (ifak), Magdeburg, **www.ifak.eu**
- Technology Platform for Product Miniaturisation in Sachsen-Anhalt –TEPROSA-, OvGU, **www.forschung-sachsen-anhalt.de/index.php3?option=projektanzeige&pid=12426**
- Innovation and New Business Centre Halle, **www.tgz-halle.de**
- Centre for Innovation Competence “SiLi-nano Silicon and Light: from Makro to Nano” (MLU), **www.sili-nano.de**

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