TU9
GERMAN UNIVERSITIES OF TECHNOLOGY

Policy Briefing 3

Shaping the Energy Transition – Innovations for a Cleaner, Safer, and Affordable Energy System

Impulses and Innovations from Germany's Leading Universities of Technology

As the Alliance of leading Universities of Technology in Germany, we bear special responsibility for the productive and innovative power of our society and economy.

We are shaping the future by making a significant contribution to solving the major challenges facing society and thus to achieving the United Nations' 17 Sustainable Development Goals (SDGs).

To this end, we combine our specific expertise in basic research, particularly in the natural and engineering sciences, with application-oriented research and innovation.

In our policy briefing series, we present concrete solutions and innovative projects from our universities to put the above-mentioned sustainability goals into practice.

The Challenge

Transitioning to a Net-Zero Economy and Lifestyle by 2045

The energy transition is one of the greatest transformational challenges of our time – for politics, society, and the economy. The global climate crisis necessitates greenhouse gas neutrality by 2045, requiring a decisive restructuring of the energy system. From an ecological perspective, a drastic reduction of emissions is essential to limit global warming and mitigate the effects of climate change.

According to the German Environment Agency (UBA), renewable sources accounted for approximately 54,1 % of gross electricity consumption in Germany (2025). The phase-out of nuclear power and coal, alongside the integration of green hydrogen, increase the pressure to act. By 2030, electricity demand is projected to rise by more than 20% – driven by factors such as electromobility, heat pumps, and the energy-intensive industrial sector. Security of supply, competitive energy prices, and climate neutrality must be harmonized within the energy transition to safeguard value creation and employment.

This Policy Briefing outlines central challenges and pathways toward a future-proof energy system. It highlights new approaches in supply – ranging from renewable energies to future technologies such as nuclear fusion – as well as smart grids, flexible storage, efficient utilization concepts, and the social dimension of the energy transition.

Through research and innovation, TU9 Universities provide vital contributions to the transformation of the energy system across all sectors:

- **» Energy Supply** – Renewable Energies and Future Options
- **» Energy Distribution** – Smart Grids for Stable Supply
- **» Energy Storage** – The Key to Balancing Supply and Demand
- **» Energy Utilization** – Advancing Efficiency, Industrial Integration, and Sector Coupling
- **» An Energy System for People** – Participation, Acceptance, and Economic Aspects

Energy Supply

Renewable Energies and Future Options

The supply of climate-neutral energy is the cornerstone of the energy transition. To achieve climate neutrality, the share of renewable energies in gross electricity consumption in Germany must nearly double. **Photovoltaics (PV)**, **wind power**, and **geothermal energy** are key drivers; however, issues regarding land availability, public acceptance and dependency on resources remain to be resolved.

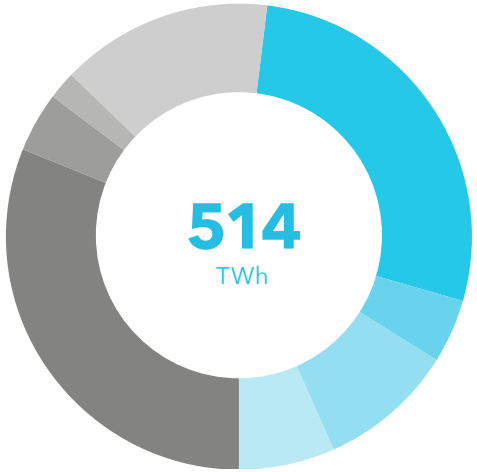
PV requires advances in efficiency, material utilization, and recyclability. In the field of **wind energy**, the focus lies on the development of higher-capacity turbines, optimized grid integration, and technologies for the utilization of low-wind sites. **Geothermal energy** offers baseload-capable heat and power generation; however, it faces challenges such as high exploration and development costs, complex permitting processes, and a lack of public acceptance.

TU9 Universities are addressing these challenges with pioneering research: ranging from innovative PV materials such as perovskites, hybrid solar cells, and automated manufacturing concepts to aerodynamically optimized rotor blades, intelligent control systems, and large-scale offshore-compatible plants, through to improved drilling technologies, real-time seismic monitoring, and new designs for heat exchangers.

Nuclear fusion is also gaining importance as a long-term option. Germany plans to invest €2 billion in fusion research by 2030. Universities are the key players here: TU9 Researchers are working on high-temperature superconductors, plasma diagnostics, and materials that can withstand the extreme conditions in fusion reactors. This technology could make an almost inexhaustible contribution to global energy supply from the middle of the century onward – provided that research and pilot plants are consistently advanced.

Energy Supply from Renewable Sources in Germany (2024):

Source: German Environment Agency (UBA) 09/2025



- Wind Power; 138.9 Twh ≙ 27%
- Hydro Power; 22.5 Twh ≙ 4%
- Biomass for Electricity Supply[1]; 48.9 Twh ≙ 10%
- Biofuels; 33.8 Twh ≙ 7%
- Biomass for Heating Supply[1]; 161.0 Twh ≙ 31%
- Geothermal Energy; 21.7 Twh ≙ 4%
- Solar Thermal Energy; 8.8 Twh ≙ 2%
- Photovoltaics; 75.4 Twh ≙ 15%

RefLau – Reference Power Plant Lusatia

At the Schwarze Pumpe industrial park, this novel power plant concept will demonstrate the potential of sector coupling using only renewable energies such as wind and solar power. The production of green hydrogen, which enables industry as well as the transport and heating sectors to use energy generated from renewable sources, represents an important step towards reducing dependency on fossil fuels.

A project of TU Dresden (TUD), Fraunhofer IEG & industry partners, funded by the BMWE (Federal Ministry for Economic Affairs and Climate Action)

» https://tu-dresden.de/forschung-transfer/strukturwandel/interaktive-karte/reflau?set_language=en

Tritium Laboratory Karlsruhe

The Tritium Laboratory Karlsruhe (TLK) is a research facility that is practically unique worldwide for handling the hydrogen isotope tritium. It develops and tests key technologies for the fuel cycle of future fusion reactors – for example, in the recovery, processing, and safe confinement of tritium. The TLK thus makes key contributions to international fusion projects such as ITER and the development of sustainable fusion energy.

A project of KIT & industry partners

» www.tlk.kit.edu/english

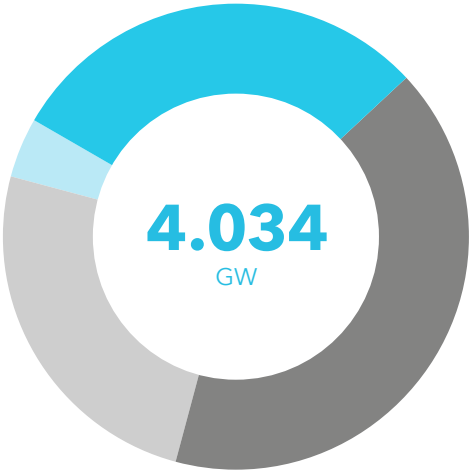
For further projects, see » catalog at the end of the Policy Briefing.

Energy Distribution

Smart Grids for Stable Supply

Global Installed Capacity for Electricity Supply from Renewable Energies (2023):

Source: REN21, Global Status Report 2024, Energy supply



- Hydro Power; 1,244 GW ≙ 31%
- Photovoltaics; 1,590 GW ≙ 39%
- Wind Power; 1,023 GW ≙ 25%
- Other; 177 GW ≙ 4%

The German energy transition is driving fundamental structural changes to the power grid. The increasing feed-in of energy from photovoltaic and wind power plants occurs in a decentralized manner, often far from consumption centers, and fluctuates with weather conditions. At the same time, electricity demand is rising significantly due to the electrification of mobility, heating, and industrial processes. The existing transmission and distribution networks – historically designed for centralized large-scale power plants – is reaching its technical and capacity limits. High-voltage grids, both alternating current (AC) systems for regional supply and direct current (DC) systems for low-loss long-distance transmission, must be massively expanded and equipped with modern control technologies to enable wide-area load balancing and the transport of renewable energy from windy northern regions to the south.

Intelligent networks, known as **Smart Grids**, form the backbone of future-proof energy distribution system: They combine digital metering technologies, automated control systems, and AI-based forecasting to balance generation and consumption in real time. This enables the stable integration of variable renewable inputs, efficient use of decentralized storage systems and targeted mitigation of peaks load. In addition to technological innovation, cybersecurity and the development of uniform communication standards are crucial to safeguard highly interconnected systems against disruptions and attacks.

From the perspective of TU9 Universities, **close integration of high-voltage grid expansion, smart grid implementation, and sector coupling of electricity, heat, and mobility** is essential. Research, education, and pilot projects must be increasingly promoted in order to secure Germany's technological leadership and to ensure a stable, sustainable, and resilient energy supply in the long term.

"Flexible Electrical Networks" Research Campus (FEN): Research and Development of a Flexible Power Grid

This grid will secure the future energy supply by integrating a high proportion of decentralized and renewable energy sources. FEN's transdisciplinary research focuses on integrating and advancing direct current (DC) technology across four areas: grids and systems, components, digitalization, and socioeconomics.

A joint project between RWTH Aachen University & industry partners, with funding from the Federal Ministry of Research, Technology and Space (BMFTR)

» www.fenaachen.net

CyberStress – Model-Based Stress Tests for Cyber-Secure Energy Networks

The project deals with how the resilience of the power grid against cyber-attacks can be defined, measured, monitored, and enforced. To this end, model-based stress tests are being developed, and the resilience of the energy system is being tested using various test scenarios.

A project of TU Darmstadt and partners, funded by the BMFTR within the Civil Security Research Program

» www.eins.tu-darmstadt.de/eins/projects/cyberstress

For further projects, see » catalog.

Energy Storage

The Key to Balancing Supply and Demand

The 5 Most Important Energy Storage Technologies:

Chemical
Hydrogen Storage, Synthetic Fuels, Redow-Flow-Systems

Thermal
High-Temperature Thermal Energy Storage Systems

Electrical
Capacitors

Electrochemical
Batteries (e.g. Lithium-Ion Batteries)

Mechanical
Flywheels Energy Storage, Compressed Air Storage, Hydraulics Storage, Pumped Hydro Storage

Energy storage is a key element in the transition to a sustainable energy system, as it provides the flexibility needed to cope with both the fluctuating supply from renewable sources and variable demand. A broad portfolio of storage technologies is required to achieve this dual balance:

Batteries, especially lithium-ion systems, are currently primarily established for short-term and decentralized applications. Next-generation batteries based on alternative materials have the potential to significantly improve costs, performance, cycle life, and sustainability. To ensure the long-term availability of batteries and the required raw materials, these materials must be recycled and managed within a circular economy.

In combination with power-to-X (P2X) processes, **hydrogen** enables long-term storage and sector-coupled use of energy, for example in industry, mobility, or heat generation.

High-temperature thermal energy storage systems allow efficient buffering of large amounts of energy for industrial processes or district heating networks.

In addition, **emerging storage technologies such as gravity-based storage, flywheels, and redox flow batteries** are gaining importance as they occupy specific niches within the energy system and can enhance overall resilience.

TU9 Universities possess the interdisciplinary expertise to further develop and optimize the materials, systems, and algorithms of storage technologies and their production processes, to support scaling, and to accelerate technology transfer to industrial applications. An innovation-friendly regulatory environment that encourages investment in storage technologies and rewards flexibility in the market is crucial for creating an energy system capable of reliably and sustainably balancing both supply and demand fluctuations.

Clean Circles – Iron as Energy Carrier in a Carbon-Free Circular Energy Economy

Iron as a reactive metal has enormous potential to boost the energy transition. The project Clean Circles teams up scientists from multiple disciplines to explore how the metal and its oxides can be used in a cycle as carbon-free chemical energy carrier to store wind and solar power and to transport them over long distances.

A project of TU Darmstadt, KIT & other partners, funded by the Hessian Ministry of Higher Education, Research, Science and the Arts

» www.tu-darmstadt.de/clean-circles/about_cc/index.en.jsp

WAVE-H2 – Research Infrastructure for Industrial Hydrogen Technologies

The interdisciplinary research platform WAVE-H2 covers the entire hydrogen value chain: From production and power-to-X technologies to the development of chemical hydrogen storage and fuel cell technologies, all the way to decentralized hydrogen utilization concepts. The goal: to advance applications that help reduce CO_2 emissions in industry.

A project of University of Stuttgart, funded by the BMFTR

» www.wave-h2.de/en

For further projects, see » catalog.

Energy Utilization

Advancing Efficiency, Industrial Integration, and Sector Coupling

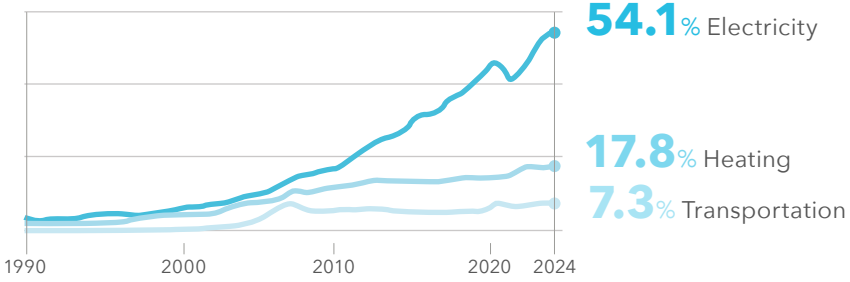
A drastic increase in energy efficiency across all sectors is the most cost-effective and fastest way to reduce energy consumption and emissions. In the industrial sector, there is enormous potential in the electrification of processes, the utilization of waste heat, and the substitution of fossil fuels with green hydrogen. TU9 Universities are conducting research on the development of innovative methods to enhance energy efficiency in industrial production processes and to integrate renewable energies into the industrial value chains.

A key component is **sector coupling**, which enables the seamless integration of the power, heating, and transportation sectors: **Heat pumps** play a crucial role in decarbonizing the heating sector by efficiently supplying buildings with heat through the utilization of ambient thermal energy. **Electric vehicles** can serve not only as a means of transport, but also as mobile storage units (vehicle-to-grid) that help to stabilize the grid. TU9 Universities are working on **smart charging concepts** that flexibly control the charging of electric vehicles in order to mitigate grid congestion.

Political measures should create incentives for energy-efficient renovations, the installation of heat pumps, the adoption of electric vehicles, and the industrial energy transformation. A broad public awareness campaign is needed to demonstrate the benefits of efficiency measures and the deployment of new technologies. Reducing energy consumption and utilizing efficiency technologies not only benefits the climate but also lowers operating costs for households and businesses in the long term.

Shares of Renewables in the Sectors – Electricity, Heating, and Transportation:

Source: German Environment Agency (UBA) 09/2025



NEVERFLAT – Innovative EV-Charging Environment for Future Low-Cost Mass Deployment

The research design considers technical and socio-economic criteria for the use of electric vehicles. It increases grid stability and the use of renewable energies, as well as social acceptance.

A project by TU Berlin & international partners, funded by Horizon Europe

» www.neverflat.eu

EReTech – Electrified Reactor Technology

EReTech will develop and validate a transformative electrically heated reactor together with the tailored catalyst for steam methane reforming. Based on SYPOX technology the reactor hosts ceramic supported structured catalyst, electrically heated by internal direct resistive heating elements. This achieves an energy efficiency close to 95 % and a reactor volume that is two orders-of-magnitude smaller.

A project of TU Munich (TUM), European partner universities & industry partners, funded by Horizon Europe

» www.eretech.eu

For further projects, see » catalog.

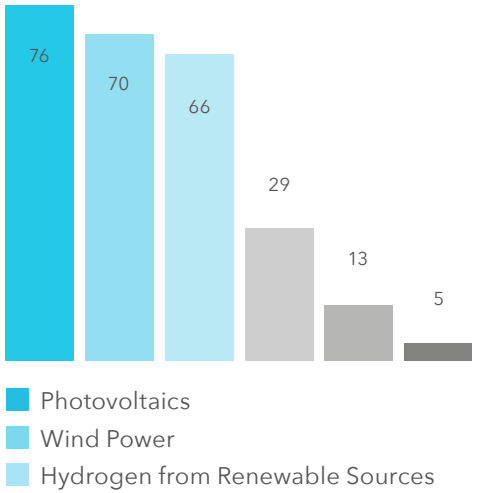
An Energy System for People

Participation, Acceptance, and Economic Aspects

Public Opinions on the Use of Energy Sources

"In order to make Germany less dependent on energy imports the following energy sources should be used much more extensively" (figures in %)

Source: Deutsche Bundesstiftung Umwelt, 10/2024



The energy transition is a society-wide endeavor whose success depends fundamentally on social acceptance and the participation of citizens. Major infrastructure projects, such as the construction of wind farms or transmission lines, frequently encounter resistance among local populations. Concerns regarding the handling of end-of-life or defective batteries also create societal uncertainty. To increase acceptance, transparent participation processes, the early involvement of municipalities, and the creation of regional value are indispensable. TU9 Universities therefore conduct interdisciplinary research on the socio-economic aspects of the energy transition and the role of citizen energy cooperatives.

Economically, the costs and benefits of the energy transition must be distributed fairly, as the transformation offers substantial opportunities for German industry. The expansion of renewable energies and the development of new infrastructure create new business models and secure Germany's long-term competitiveness as an industrial powerhouse. At the same time, the burden of energy costs on households and companies must remain manageable. Designing fair levy and surcharge schemes that not only cover the costs of grid expansion but also ensure social safeguards is a key political task. **TU9 Universities analyze the economic impacts of various funding mechanisms and tariff models to support an equitable distribution of costs and benefits**.

The energy transition is also a driver of innovation, enabling Germany to strengthen its leading position in key technologies such as photovoltaics, wind power, energy storage, and hydrogen. A sustainable industrial policy that promotes research and development while simultaneously safeguarding competitiveness is needed here.

Living Laboratory "70 GW Offshore Wind"

The research platform analyses the planned expansion of offshore wind energy from a socio-technical perspective. It aims to create the foundations and development pathways for the construction of 70 gigawatts of offshore wind energy capacity in the German North Sea by 2045. Together with stakeholders from government agencies and industry, it will develop sustainable strategies for action.

A project of Leibniz University Hannover, TU Braunschweig & other partners

» www.reallabor.offshore.uol.de/en

Connect2Transform (C2T) – Living Laboratory for the Energy Transition

The research project aims to drive forward the transformation of heating and cooling supply in urban areas. Over the next three years, Braunschweig's Bahnstadt district will be developed into a real-world laboratory for the energy transition.

A project of TU Braunschweig, the City of Braunschweig and regional industry partners, funded by the BMWE

» magazin.tu-braunschweig.de/en/pi-post/the-city-of-braunschweig-launches-an-innovative-energy-transition-project/

For further projects, see » catalog.

Further Projects

Energy Supply

"SupplHyInno Rhineland" Cluster4Future

The Cluster brings together more than 50 industry partners and 25 research centers across the entire hydrogen ecosystem, fostering interdisciplinary collaboration. Its goal is to accelerate the adoption of new hydrogen technologies by removing key bottlenecks. With the start of its second implementation phase, the cluster is focusing on the supply industry for hydrogen technologies and the development of decentralized hydrogen ecosystems.

A project by RWTH Aachen University, with funding from the BMFTR

» www.h2-cluster.de

FLOATFARM – Developing the Next Generation of Environmentally-friendly Floating Wind Farms

FLOATFARM will take floating offshore wind power (FOW) to the next level of technological maturity using a series of new concepts, innovations, and methods. Particular attention will be paid to reducing the negative environmental impact on marine life and improving public acceptance of FOW parks.

A project by TU Berlin & international partners, funded by the European Union

» https://floatfarm-project.eu

COIN – Energy Generation from Waves

The COIN project (Control-Oriented INnovations for future wave energy farms) started on 1 November 2025. COIN brings together nine leading organisations from across Europe to develop innovative solutions to improve the reliability, lifespan and sustainability of future wave power plants.

A project of TU Braunschweig & European partners, funded by Horizon Europe

» www.magazin.tu-braunschweig.de/en/pi-post/horizon-europe-funds-ground-breaking-coin-project-to-boost-wave-energy-innovation/

DFG Collaborative Research Centre – Offshore Megastructures

The CRC at Leibniz University Hannover develops concepts for the wind turbines of the future. In order to meet the increasing demand for energy, these turbines will be over 300 metres high, with rotor blades of over 280 metres in diameter.

A project of Leibniz University Hannover, TU Braunschweig, TU Darmstadt, TUD & other European partner institutions, funded by the German Research Foundation (DFG).

» www.sfb1463.uni-hannover.de/en

GOLIAT – Ground Operations of Liquid Hydrogen AircrafT

The European research project brings together ten partners from eight countries to jointly advance the widespread deployment of hydrogen at airports. LUH is a member of GOLIAT. The main area of inquiry is the design and cost-effectiveness of the liquid hydrogen supply for airports.

A European project with the participation of Leibniz University Hannover, funded by Horizon Europe.

» https://cordis.europa.eu/project/id/101138379

SolBat – Future Batteries Fueled by the Sun

Solar batteries unite a solar cell and a battery within one device. The SolBat Center drives this innovative bridge technology between energy conversion and storage, explores the operating optoionic principles and translates them into first prototypes. Its objectives span the entire value chain from fundamental research on optoionics and new energy materials, through device design and techno-economic assessment, up to the development of sustainable and scalable production processes.

A project of TUM & Max-Planck-Society, funded by the Bavarian Ministry of Economic Affairs, Regional Development and Energy

» www.solbat.org

Word Record for Lithum-Ion Conductors

Solid-state batteries are considered a key technology for the future: they can store more energy and do not rely on flammable materials like current lithium-ion batteries. Researchers at TUM and TUMint.Energy Research have now taken a significant step towards improving solid-state batteries. They developed a new material made of lithium, antimony and scandium that conducts lithium ions more than 30% faster than any previously known material.

A project of TUM

» www.tum.de/en/news-and-events/all-news/press-releases/details/world-record-for-lithium-ion-conductors

FlexGeo – Shaping the Future of Flexible Geothermal Energy

The project is developing modular, reversible ORC (Organic Rankine Cycle) technology fort he flexible use of geothermal energy in heating and cooling networks.

A project of TUM, European partner universities & industry partners, funded by Horizon Europe

» www.flexgeo.eu

Further Projects

Energy Distribution

N5GEH – National 5 Energy Hub

If we are to succeed in transitioning to renewable energy and moving from a centralized to a decentralized energy system, we need a targeted initiative to introduce new communication structures in decentralized energy technology. The hub is dedicated to utilizing these kinds of modern digital communication technologies.

A project by TUD & RWTH Aachen University, funded by the BMWE

» www.n5geh.com

Energy Lab

The Energy Lab at KIT is a leading research platform for investigating integrated energy systems. There, wind and solar power generators are coupled with storage facilities, consumers, and chemical process chains for green hydrogen and synthetic fuels – for example, via power-to-liquid plants, electrolysis, and synthesis gas processing. These plants are part of demonstration and scaling projects (e.g. Kopernikus P2X) that test the interaction of grids, storage systems, and molecular energy carriers.

A project of KIT & other partners, funded by the BMFTR, BMWE, Forschungszentrum Jülich & German Aerospace Center (DLR), among others

» www.elab.kit.edu/english

Kopernikus Project "SynErgie"

How can the fluctuating supply of renewable energy be effectively synchronized with the demands of German industry, adapting industrial processes to the available electricity and thereby making production more flexible? SynErgie (Synchronized Energy Management for the Alignment of Energy-Adaptive Processes) is working on intelligent, digital, and automated solutions to address these challenges.

A flagship project of the German Federal Government's digital strategy, coordinated by the University of Stuttgart with the participation of TU Braunschweig & TU Darmstadt, funded by the BMFTR

» www.kopernikus-projekte.de/en/projects/synergie

Energy Storage

New H2 Infrastructure

A state-of-the-art research platform for hydrogen and fuel cell technologies is being created at NFF (Lower Saxony Research Centre for Vehicle Technology) at TU Braunschweig. The aim is to comprehensively expand a gaseous and liquid hydrogen infrastructure to support basic and application-oriented research in the field of energy storage and propulsion.

A project of TU Braunschweig & Fraunhofer IST, funded by the European Regional Development Fund and the Lower Saxony Ministry of Science and Culture

» www.magazin.tu-braunschweig.de/en/pi-post/innovation-boost-for-hydrogen-technology/

LEBAZ – Learning Factory for Circular Battery Production

A key success factor for the German battery industry is the training of skilled workers. The necessary knowledge can be acquired in a practical manner at the learning factory for circular battery cell production at TU Braunschweig. Here, real production processes are linked with virtual elements, creating an innovative learning system for building basic and advanced skills in areas such as energy efficiency, life cycle assessment and digitalisation. The learning factory also serves as a test environment where knowledge from research can be transferred directly into industrial practice.

A project of TU Braunschweig, funded by the BMFTR

» www.tu-braunschweig.de/en/iwf/nplce/research-projects/lebaz

ZellSys – Cellular Energy Systems for Transforming the Energy Supply in Suburban Spaces

This project is intended to develop a feasibility study for transforming the energy system in rural areas into a cellular energy system. The focus is on areas on the outskirts of cities that are not part of a central heating and cooling supply system, but which are expected to exhibit stronger energetic coupling with the urban core in the future.

A project by TUD funded by the BMWE

» zellsys.de/en/vision

Cluster of Excellence "Post Lithium Storage (POLiS)"

The Cluster of Excellence is a joint research initiative of KIT and the University of Ulm for the development of future battery systems. The focus is on high-performance and high-safety storage devices that offer significantly higher energy density and improved environmental compatibility compared to conventional lithium-ion cells. POLiS is researching both novel cathode and anode materials and innovative cell concepts with the help of modern simulation and data methods.

A project of KIT & other institutions

» www.postlithiumstorage.org/en

Further Projects

Case Study "Less Curtailment via Increased Flexibility in the Energy System"

To achieve the goals set out by the Climate Action Act, significant restructuring of the German energy system is necessary. The study develops a scenario for the future energy system that is based on the current political goals. It investigates how important flexibility will be in the future and what demands will be made of it. Using today's energy system as the starting point, it examines and economically optimises a transformation pathway spanning until 2050.

A project of Leibniz University Hannover & other partners

» https://repo.uni-hannover.de/items/0fb4f680-1a28-441b-8b3c-8fd08f114623

Energy Utilization

Cluster of Excellence "The Fuel Science Center (FSC)"

The FSC Cluster of Excellence conducts research on sustainable fuels using a holistic approach that aligns fuel production and use with application-specific requirements. 2026 will see the launch of the successor cluster, FSC², which expands the focus to include renewable chemicals and electrochemical energy conversion processes.

A project of RWTH Aachen University

» https://www.fuelcenter.rwth-aachen.de/cms/~siul/fuelcenter/?lidx=1

GaNius – Energy Efficient Power Electronics (DFG Priority Program 2312)

Thanks to the advances in wide bandgap semiconductor materials, power electronics are an emerging research field. The modern semiconductor gallium nitride (GaN) opens up new converter circuits for high-frequency power electronic components and efficient, highly compact systems. In an interdisciplinary approach that combines the expertise from solid state physics, semiconductor technology and system design, scientific methods are being researched to develop novel devices, circuits and components for highly efficient power electronic systems.

A joint project of TU Berlin, TU Braunschweig, KIT, Leibniz University Hannover, TUM, University of Stuttgart & other partners, funded by the DFG

» www.ganius.de

B-SWIVT – Sector Coupling for Energy Supply in Residential Areas

B-SWIVT focusses on operational optimization within a settlement with a sector coupling energy system. This type of system is currently and in the future being sought in many cities to drive forward the energy transition in the heating, electricity and mobility sectors. These residential districts can serve as active energy cells that use the potential for flexibility and load shifting on the electricity market. Using real data from existing buildings, it is possible to optimize the operation of the sector-coupling energy system and thus support the city's climate protection goals.

A Project of TU Darmstadt, University of Stuttgart & industry partners, funded by the BMWE

» www.swivt.tu-darmstadt.de/swivt_ii

COOLPOL – Energy-Efficient Cooling with Electrocaloric Materials

The European research consortium COOLPOL (Cooling with Electrocaloric Polymers) is developing a cooling technology that operates without harmful refrigerants. The key: electrocaloric polymers that cool down and heat up when the electric field is changed. The University of Stuttgart is developing the power electronics for electrocaloric climate devices, with the aim of achieving competitive efficiency.

A project involving the University of Stuttgart, funded by the European Research Council (ERC)

» www.iew.uni-stuttgart.de/en/research/smartConverters

An Energy System for People

SUNNY – Sustainable Energy Systems for Refugee and Host Communities in Africa

The project improves sustainable access to energy for rural and displaced communities in Rwanda and Uganda. Using an inclusive approach, the project consortium develops innovative solutions that incorporate local conditions and are embedded in existing socioeconomic structures.

A project by TU Berlin & international partners, funded by Horizon Europe

» www.sunny-project.eu

STRise – Sustainably Shaping the Energy Transformation

In the STRise research network (Stuttgart Research Partnership on Integrated Systems Analysis on Energy), four institutes combine their expertise to form the largest competence center for energy system analysis in Germany. The goal is to jointly and holistically shape the transformation to a sustainable energy system using transdisciplinary approaches – taking into account the technical, economic, ecological, and social dimensions.

A project of the University of Stuttgart in cooperation with the DLR & other partners

» www.strise.de

RWTH Aachen University | Technische Universität Berlin | Technische Universität Braunschweig
Technical University of Darmstadt | TUD Dresden University of Technology | Leibniz University Hannover
Karlsruhe Institute of Technology | Technical University of Munich | University of Stuttgart

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