



**TECHNOLOGY CENTRE FOR ENERGY**  
**UNIVERSITY OF APPLIED**  
**SCIENCES LANDSHUT**

The TZE offers laboratory capacity for storage system research and also provides the scientists with various storage systems:

### **ELECTRIC ENERGY STORAGE**

Regenerative energy is usually generated on a periodic basis (e.g. when the sun shines or the wind blows). Energy storage systems are needed to make efficient use of this energy, and therefore to play an important role in guaranteeing the success of electro-mobility concepts.

Energy storage devices (lithium-ion batteries) can be produced manually using raw chemicals, and different recipes can be tested, at the TZE's own lab-line. The TZE is equipped for research into the material properties of energy storage systems. Regardless of the battery type in question, single batteries and entire battery packs can be analysed and qualified in the battery testing laboratory.

In addition to materials research, the TZE offers consultancy in relation to batteries and rechargeable batteries.

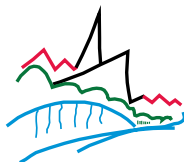
### **THERMAL ENERGY STORAGE**

Thermal energy storage systems also play an important role in modern energy technology in addition to chemical and electric storage. In particular, research is carried out at the TZE into interactions between different storage systems for the chronologically independent utilisation of power and heating for individual and integrated solutions.

Funded by:



Supported by:



**TECHNOLOGY CENTRE FOR ENERGY**  
**HOCHSCHULE LANDSHUT**  
**University of Applied Sciences**  
Wiesenweg 1  
94099 Ruhstorf, Germany  
Tel. +49 (0)8531 - 914044 0  
Fax. +49 (0)8531 - 914044 90  
info@tz-energie.de



**RESEARCH**  
**TECHNOLOGY**  
**SERVICE**  
**CONSULTING**

## THE TECHNOLOGY CENTRE FOR ENERGY

The Technology Centre for Energy (TZE) in Ruhstorf an der Rott is one of the research institutes at the Landshut University of Applied Sciences. Located close to the German-Austrian border, a high number of core subjects relating to energy-related research are concentrated at the centre.

As a commercially focused facility, the TZE collaborates with research institutes, businesses and industry partners, and offers a range of services within the fields of research it covers.



## TZE FACILITIES

- Laboratories for the production of lithium-ion batteries in addition to a wet-chemical laboratory staffed by appropriately qualified scientists
- Demonstration site for decentralised energy systems ( $\mu$ -CHP-installations), chemical and electrical energy storage systems, and a metrological environment for system analysis
- Engineering services centre for municipalities, businesses and industry, conceptual and technical, including the development, qualification and quantification of methods and systems for the supply of decentralised, resource conserving energy
- Consultancy and competency centre both for the Landshut University of Applied Sciences and the wider region for questions relating to the energy transition and the following areas of research:

## DECENTRALISED ENERGY SYSTEMS

Decentralised energy systems make it possible to cover both domestic and commercial energy requirements on site and as needed in a highly efficient manner. In collaboration with various industry partners, the TZE is carrying out research into the optimisation of these systems through the integration of thermal, electric and chemical storage units in conjunction with renewable energy sources.

Research into the system aspects of CHP and energy storage technology (in the < 10 KW performance class), efficiency enhancement potentials as well as grid relief issues is carried out at a dedicated combined heat and power (CHP) laboratory.

## GRID INTEGRATION

Grid integration refers to the integration of production, distribution grid and end consumers within a single system, whereby the main focus is on energy storage, load management and production management. The distribution grids are the connecting element between production and consumption.

In order to cater to the demands of the modern energy industry, a rapidly increasing proportion of which involves renewable energy sources and on-site energy generation, the power grid needs to become intelligent – keyword: Smart Grid.

- Analysis of grid connection scenarios and potential means of managing energy feeds
- Analysis of grid expansion concepts for safe and reliable power grid operations
- Monitoring the power quality and general supply safety

## EFFICIENT ENERGY SYSTEMS

Sustainable energy systems are the intersection of energy efficiency, sufficiency, and regenerative energy sources. As few resources as possible should be used for the generation of power, heat and cooling, in conjunction with as high a yield (efficiency level) as possible. In order to attain a sufficiently high level of energy efficiency, one can consider various scenarios:

- Local and regional energy supply models
- The development of energy efficient, sustainable supply systems and regional value creation
- Energy management in production facilities
- Rational energy supply
- Support during the introduction of energy management systems
- Climate-friendly / CO<sub>2</sub>-neutral energy generation
- Simulation and development of heating grids on the basis of regenerative energy sources

## ENERGY STORAGE

Energy storage systems are vital for the success of the energy transition. Scientists at the TZE are working on research projects aimed at gaining a more profound understanding of different storage technologies.