

Research for the energy transition

Addressing climate change is a social obligation and one of the greatest economic opportunities.

Under the motto »Designing the energy transition«, we at the Fraunhofer Institute for Energy Economics and Energy System Technology IEE have been conducting research for an energy supply based on renewable energies for over 30 years – both nationally and internationally.

We develop solutions for technical and economic challenges in order to further reduce costs, secure supply, advance digitalization in the energy industry and develop new business models in the energy transition.

Fraunhofer IEE

Institute management

Dr. Reinhard Mackensen (Director (acting))

Dr. Philipp Strauß (Deputy director)

Staff and income

- Approx. 450 scientists, employees, students
- About 38 million euros per year

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Our research fields

Research and development for the successful energy system transformation



Grid Planning and Grid Operation

How can energy grid infrastructures be designed and operated to ensure resilient, secure and cost-effective supply both today and in a future decarbonized energy system?



Grid Stability and Power Converter Technology

How can power converters and drives, electrical grids and their operating equipment be further developed and controlled so that power systems function stably, efficiently and safely?



Energy Process Engineering

Which technology enables the efficient and economic coupling between thermal, electrical and biochemical conversion stages?



Thermal Energy Technology

On which path and with which technologies do we shape the innovative implementation of the heat transition in buildings and cities?



Energy Informatics

How can energy economics be supported by informatics to allow the energy system to run smoothly when a large amount of power is generated decentrally?



Energy Meteorology and Renewable Resources

What potential do renewables have and how can their spatial and chronological behavior be modeled and forecasted?



Energy Economics and System Analysis

How can transformation paths to a decarbonized energy system be designed in a techno- and socio-economically optimal way?

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Short Profile

Fraunhofer Institute for Energy Economics and Energy System Technology

More on the topic of research fields:
www.iee.fraunhofer.de/research



Our business units

The business units of Fraunhofer IEE are specialized in the target-oriented integration of research results into practical applications.

Here, the thematic spectrum of Fraunhofer IEE ranges from techno-economic considerations and scenarios for the planning and operation of energy supply structures, support in field tests, to optimization of the interaction of components.

The further development of the overall system plays a significant role: the progressive integration of renewable, decentralized generators and the redesign of grid infrastructures such as electricity and heat grids. This includes changing requirements resulting from the system coupling of electricity, heat, gas and transport. The objective is to ensure coordination between fluctuating generation and flexible demand.

Services and solutions

The institute's services include collaborative research within consortia projects, their coordination and contract research for partners from the energy industry.

In addition, Fraunhofer IEE offers testing and consulting services on specific issues, the development of prototypes and functional models, and the evaluation of field tests. The focus is generally on the advancement of the energy system and the creation of solutions in effective, decentralized and renewably organized structures.

Dr. Reinhard Mackensen
Director (acting)
Fraunhofer IEE

We explore and develop solutions for sustainably transforming energy systems based on renewable energy. Our service portfolio deals with current and future challenges faced by the energy industry and energy system technology issues.

We examine economic and technical problems in an interconnected manner. Thus we are able to actively and competently support our industrial and political clients and partners. The basis for this is provided by our business units and research fields.«



Designing the energy transition together!«

Analysis and Consultancy in Energy Economics

Simulation-based studies and energy economic analyses for your economic, strategic and political decisions.

Energy Meteorology Information Systems

The use of reliable forecasts and extrapolations for future renewable energy feed-ins and energy consumption allows the operation of modern, stable and economical energy systems.

Digital Portfolio Management

Solutions for digitalization, automation and the use of intelligent systems in the energy industry.

Grid Planning and Network Operation

Services for system analysis and network design, as well as planning and operational management of energy networks in times of automation, digitalization and flexibilization.

Power Electronics and Electric Drive Systems

Development of compact and highly efficient power converters with grid-forming properties, innovative electrical machines and rapid prototyping systems.

Hardware in the Loop Systems

Solutions for simulation and emulation of electrochemical storage and control in power engineering.

Plant Engineering

Technical and economic evaluation of plants and sites, plant and operation optimization. Demonstration plants from conception to validation.

Measuring and Testing Services

Laboratory tests and on-site measurements of distributed generation plants, their components, grid characteristics and performance. Consultation on the design and optimization of laboratory environments.

Wind Resource Assessment with LiDAR

Optimized measurement and measurement strategies with our own LiDAR equipment as well as measurement for long ranges with WindScanner LiDAR.



More on the topic of business units:
www.iee.fraunhofer.de/business