

Usage of Energy

One of the focal areas of the institute is 'Usage of Energy' concerning energy distribution in relation to infrastructures inside buildings. The objective is to convert energy into the needed form like heat, light or mechanical work as efficient as possible at the point of usage.

Cities and buildings may and have to deliver a relevant part to the upcoming energy revolution. Options for further heat insulations at buildings have reached their limits. In contrast, there is a high potential for efficiency enhancement by using smarter building technologies. Compared to the past, all functions like illumination, heating and air-conditioning will be planned and implemented holistically.

The WEI explores the basic principles for the usage of energy up to finally near-autonomic building supply.



Westfälische Hochschule, Campus Gelsenkirchen

The Westphalian Energy Institute (Westfälisches Energieinstitut, WEI) is a central research institute of the WH (Westfälische Hochschule) interconnecting all competences in technology of energy across all locations and departments.

Since its foundation in 2012, the institute with more than 24 professors, its scientific employees and post-graduates was able to build strong partnerships for application of near research and development activities with industrial companies as well as with other scientific institutes.

Focus areas of research

- Renewable Energies
- Energy Conversion and Distribution
- Energy Economics and Energy Policy
- Usage of Energy



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Westphalian Energy Institute

Focus areas of research

Renewable
Energies

Energy Conversion
and Distribution

Energy Economics
and Energy Policy

Usage of Energy



Research and Development
at the Westfälische Hochschule
University of Applied Sciences



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Energy Conversion and Distribution

At 'Energy Conversion and Distribution', the researchers of the WEI deal explicitly with questions of technology for energy systems. The WEI is involved in research and development projects on systems for combined heat – cooling – power generation as well as projects on power electronics for stationary and mobile applications.

In the field of 'Energy Storage' research is done successfully on concepts, realization and monitoring of hydrogen systems since many years. Additionally, components for hydrogen energy systems are developed. On top of that, within the single teams of experts different special development subjects emerged.

These are for example: "high-pressure electrolysis" in hydrogen technology, "smart materials and functional layers" in materials science, "metal forming by pulsed wire explosion" in high voltage technology/pulse power technology.



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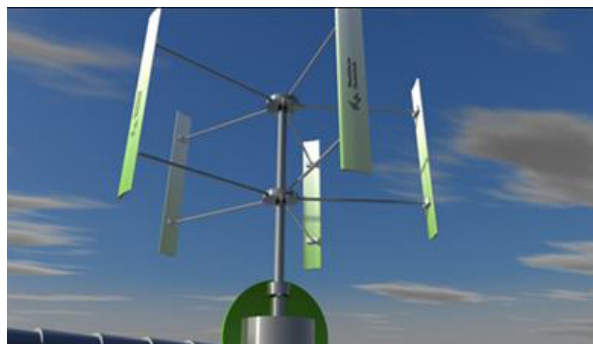
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Renewable Energies

Key activities of 'Renewable Energies' are future energy conversion in combination with resource efficient usage of energy in renewable systems.

Based on the German energy transformation in compliance with needed security of supply, research and development focuses on renewable energies and CO2 neutral systems. With the help of the expertise of the WEI the department is able to contribute competences in solar, wind and biomass technology to several projects. This leads to individual development of equipment and network planning.

R&D deals among others with projects on usage of wind energy, solar energies, biomasses, pelletizing as well as sustainable development of systems like recycling of rare earths, and decomposition and recycling infrastructures.



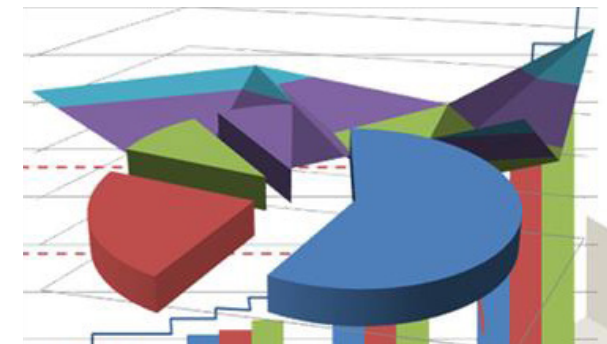
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Energy Economics and Energy Policy

The economics of energy is founded on the 'Energy Economics Triangle'. This is based on security of energy supply, ecological sustainability, and profitability in usage of energy, not to be confused with maximum profit rate at energy suppliers. Governmental intervention to economics of energy means policy of energy. It defines the institutional relation (government vs. market) and the structure of economics of energy. Policy of energy is a sectoral policy of structure and, therefore, a part of policy of economy with interdependent relations to policy of environment and climate as well as policy of transport.

Subject of research on energy economics and policy are investigations in issues and policy of the energy industry, in areas like generation, storage and transport of energy through grids to trade of energy at the energy exchange.



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