

Institute of Energy Engineering (IEE), Kassel, Germany

The Department of Efficient Energy Conversion was founded in 1995 at the Institute of Energy Engineering (IEE) of the Faculty of Electrical Engineering of the University of Kassel.

The tasks of the department encompass the fields of renewable energies and efficient use of energy. The main focus of the work with renewable energies lies hereby on autonomous, non-grid-connected PV and PV-hybrid systems for the supply to remote areas. The thesis topics on the field of rational use of energy are concerned above all with energy saving in office and administration buildings, chosen branches from trade and industry and the creation of energy concepts. In both directions, the occupation with processes and techniques for energy management has taken centre stage in the last few years. Thanks to the close co-operation with the "Institut für Solare Energieversorgungstechnik" (ISET) and the department "Elektrische Energieversorgungssysteme" (EVS), a focal point on renewable energies and energy efficiency in research and education has been established in Kassel.

Shortly after its founding the department moved its offices and laboratories into the newly built block on Wilhelmshöher Allee / Emilienstraße. The office section is situated on the upper floor of the C wing of the new building and surrounds a spaciouly designed terrace, which not only serves as a communication and meeting point for the staff but also as a test platform for photovoltaic applications. (Figures / pictures of the new building, front-view and rear-view, terrace)

On the ground floor the department runs several laboratories as well as two workshops, in which basic mechanical and electrical tasks can be accomplished. In the climatic laboratory there is a spacious climatic chamber, in which mainly investigations on the increase of energy efficiency of freezing devices are carried out. In the water laboratory water treatment equipment based on UV disinfection and anodic oxidation as well as its photovoltaic energy supply are developed and tested. In the bus laboratory field-bus systems and networks are operated for the development and testing of communication techniques and strategies for energy management. (Photos of the three laboratories)

The Design Centre for Modular Supply Technology (DeMoTec) which has been set up by ISET, serves the purpose of design and presentation of equipment for the application in renewable energy use, efficient energy utilization and water treatment. The department shares the use of the spacious infrastructure and operates a test stand for energy management and billing system for village power supply systems and a CHP test stand for the use of bio-fuels.

In the free space between the department and the DeMoTec hall, there are further test systems such as the mobile hybrid system AREP and the solar lamp of the Heliodor model. Those installations also serve for the development and testing of energy management systems. (Photo: AREP, Heliodor)

For first projects after the founding, the department enjoyed the support of two more assistants. This was partly enabled by an initial financial support from Energie Aktiengesellschaft Mitteldeutschland (EAM). Besides a part-time secretary post, one research assistant is financed by the university. Through the subsequent fund-raising from third parties the number of staff could be steadily increased and has risen to about 10 members within the recent years. So far there have been in total 19 research and technical staff employed on time-limited contracts.

The staff in the initial years came to the department with experience from abroad and the relevant contacts. This is reflected through the strongly international orientation of the projects and co-operations, which have been established within the past years. The by far largest part of the third-party funds raised came from research and demonstration projects of the European Union programs. One result of the international orientation is the increasing number of foreign research assistants from almost every continent. The third party funding statistics show clearly that, despite the numerous locally and regionally implemented projects, whose part in the yearly budget is infinitely small, the share of the European Union strongly dominates.

The third party funds steadily increased in the initial years and have in the past few years reached a level between 400,000 and 600,000 Euro per year. This performance could only be achieved thanks to the above-average commitment of the staff members taking into account that the Hesse federal government financed only one single post.

Within the first six years, 6 doctorates and 122 dissertations submitted for diplomas and student projects have been accomplished in the department. In addition, four company spin offs resulting from the department's activities have been incorporated in the meantime by staff members.

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