

INTRODUCTION OF THE NATIONAL CENTRE FOR RESEARCH AND APPLICATION OF RENEWABLE ENERGY SOURCES

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Annotation

Slovak University of Technology in Bratislava acquired financial support from the European Fund for Regional Development for the establishment of the National Centre for Research and Application of Renewable Energy Sources in the framework of the “Operation Program Research and Development”. Slovak University of Technology in Bratislava (STU) is a research oriented university contributing to the development and spreading of scientific knowledge. Paper deals with the presentation of the activities of the National centre for research and development of renewable energy sources.

Keywords

biomass, hydro energy, laboratories, solar heat

1 INTRODUCTION

The National Centre for Research and Application of Renewable Energy Sources is professionally guaranteed by four Faculties of STU:

- Faculty of Chemical and Food Technology
- Faculty of Electrical Engineering and Information Technology
- Faculty of Mechanical Engineering
- Faculty of Civil Engineering

The basic goal of the centre are focusing of research activities of research teams on new, ecological friendly renewable resources of energy, especially from biomass and solar energy. The Centre has three goals:

- establishment of centre of excellence as a network of research teams
- equipment of four laboratories at the faculties by special instruments
- equipment of centre of excellence by efficient computers.

2 ACTIVITIES OF THE NATIONAL CENTRE FOR RESEARCH AND APPLICATION OF RENEWABLE ENERGY SOURCES

National Centre for Research and Application of Renewable Energy Sources has been established by the Slovak University of Technology in Bratislava in cooperation with other centers of excellence for the development of fundamental and applied research and the transfer of knowledge to practice.

The aim of the Centre is to increase the research and innovation potential of STU, and the integration of research teams concentrated on new, ecologically acceptable renewable energy sources (RES). Essential subjects of the research are:

- energy and materials from biomass,
- solar heat and electricity,
- hydro energy.

Activities of the Centre contribute to the competition ability and success of STU in international research cooperation. Realization of top research also provides for the transfer of newest knowledge into the university's study programs educating young generation of specialists.

There are three main subjects of the National center: biomass, solar energy and hydro energy. The goal of the national center is to improving university research potential and integrating research teams focusing on new and eco-friendly RES. National Centre offer cooperation in following research topics:

- utilization of biomass energy
- utilization of solar energy
- utilization of hydropower potential
- connecting of decentralised renewables into interconnected power system
- computer modelling and simulation of multiphysical tasks
- photovoltaic systems simulation

Except the research and development activities in above mentioned fields, the Center is active in the educational activities for primary and secondary schools and also for public.

One of the activities is presentation at the Researchers' Night. It is a European-wide project supported by the European Commission aimed on presentation of scientists and popularization of science. It shows scientists as ordinary people that have their hopes, dreams and families and contribute to welfare of the whole society.

Among others activities belongs seminars at primary and secondary schools where the renewable energy sources are presented in an easy and suitable way for students. It is possible to present them just small models therefore we organized also presentations in our laboratories. We offer them e.g. pumping power plant (fig. 2), high voltage laboratory (fig. 3) and many other models from our laboratory of the renewable (heat pump, wind turbines).

National center also improve international cooperation between other European institutions. Among these institutions belong e.g. Goce Dolčev University Stip in Republic of Macedonia, Instituto Superior de Engenharia do Porto in Portugal, universities in Czech republic and Ukraine. Cooperation between STU in Bratislava and Goce Dolčev University Stip in Macedonia is focusing to the smart grid technologies, via VEGA grant called 'Smart grid as part of power distribution networks - new measurement methods and consumption control methods'. The project is aimed at complex analysis of possibilities of building intelligent networks. It analyzes and solves the issue from the point of view of network functionality, its elements, their mutual relations and the impact on electricity market. The project deals with the creation of a laboratory model of smart grid and solution for optimization of production, consumption and electric power accumulation (including accumulation in the form of hydrogen). Results of smart grid analyses shall be applied to definition of a new subject – Operator measured electricity consumption data and for the proposal of methodology of management and appraisal of energetic efficiency of lighting systems.

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