Sources are promoted in example by series of exhibitions of the mobile RES laboratory, which visit all subregions of Malopolska and lectures. Several information about RES will be included in RES Guide, which is prepared and will be widespread.

HYBRID RES SYSTEMS ON EXAMPLE OF THE AGH-UST EDUCATIONAL AND RESEARCH LABORATORY OF RENEWABLE ENERGY SOURCES AND ENERGY SAVING IN MIEKINIA, POLAND

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The educational and scientific activity of the Faculty of Geology, Geophysics and Environment Protection, AGH University of Science and Technology (AGH-UST), Krakow, Poland, is closely related to the subject-matter of renewable energy sources (RES). The specialty "renewable energy sources" has existed and research work in this field has been conducted for several years. It created the need for establishment of educational and research infrastructure that would enable practical courses and laboratory studies, which would enrich the educational offer of the University and improve the quality of the research work. Laboratory, besides didactic and research function, also acts as information and advisory role in terms of RES and energy saving.

Laboratory disposes of different RES installations. Education in the field of geothermal energy in Laboratory Miekinia is based on heat pumps. The Laboratory is heated by four heat pumps with ground sources. Heat pumps works in three different heating systems for building heating and hot domestic water production. They use borehole heat exchangers (83, 87 and 100 m deep) and a horizontal ground source (area of 600 m^2). The building is also chilled in the passive way, without the heat pump's compressor use. The installation's parameters are measured with temperature sensors, heat meters and electric meters and shown in BMS system. Apart from the

system of heat pumps the Laboratory is in disposal of several demonstration heat pump installations. Hot domestic water is also prepared by the solar collectors. On the roof and the ground there is 3 solar collectors installations of different type (flat and heat pipe type filled with glycol or water for the system circulation). Recently, in the Laboratory a new research stand for photovoltaic was established. The stand which consists of all PV types available on the market is able to give the comparison between different technologies. This is the supplement for smaller PV and wind installation which was established at the very beginning.

AGH University of Science and Technology in cooperation with Krzeszowice Commune and Malopolska Region Energy and Environment Agency are going to create Science and Technology Park 'Miekinia' – Center for sustainable development. Main Center's activities will be research and development, transfer of technology and innovation – Economic activity zone and popularization of science in the field of energy.

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ПРОБЛЕМИ ВПРОВАДЖЕННЯ НАУКОВО-ІННОВАЦІЙНИХ ЗАХОДІВ З ЕНЕРГОЕФЕКТИВНОСТІ НА ТЕРЕНАХ УКРАЇНИ

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Енергоефективність беззаперечно є одним із пріоритетів енергетичної політики України [1]. Незважаючи на очевидність цієї теми, впровадження енергоефективних заходів відбувається дуже повільно, а використання енергії залишається надмірним. Обсяг енергії, що використовується для виробництва одиниці