

ALBANIAN ENERGY AUDITING TEAM



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NEWSLETTER

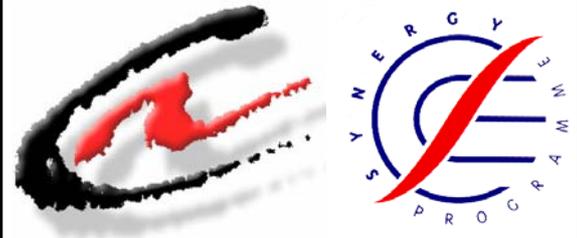
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Address:

Blvd. "Zhan D'Ark", No. 2, Tirana, ALBANIA
P.O. Box 2426
Tel: + 355 4 233 835; Fax: + 355 4 233 834
Email: info@eec.org.al
Internet: www.eec.org.al

THE ENERGY IN ALBANIA



THE ENERGY IN ALBANIA (NEWSLETTER)

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PROJECT "ENERGY AUDITING OF ALBANIAN BUILDINGS - CAPACITY BUILDING, METHODS AND TOOLS"

1. Background

The energy situation in Albania has been difficult throughout the transition period and especially during the last years. The situation aggravates during the winter season, because of the space heating of buildings. Half of the energy required for heating is provided by electricity. Buildings in Albania have been constructed with little concern for energy efficiency, for several years the main driving factor has been construction of buildings at lowest investment costs. To reduce the energy consumption and costs, and to improve the indoor environment, it is necessary to renovate and implement energy efficiency measures in buildings. Projects should be developed and implemented in a structured and efficient way, requiring good Energy Auditing and Project Management methods and tools, as well as good skills of local specialists. To ensure long-term effects, local engineers, specialists and managers should be trained, and the subject included in the Curriculum of Universities. For more than 15 years has ENSI® - Energy Saving International developed and implemented capacity building programmes on "Energy Auditing of Buildings" in a number of Central and Eastern Europe and CIS countries. The programmes have been for engineers, specialists, energy auditors, managers, university professors and teachers as well as university students. The Norwegian methodology has been introduced, and comprehensive materials and tools including software for energy and profit-

ability calculations adjusted and provided for wider dissemination. A sustainable development is secured by an “interactive training of trainers” approach, building local capacities and skills able to continue and further develop by themselves. This summer the Norwegian Government provided financing to implement the project “Energy Auditing of Albanian Buildings - Capacity Building, Methods and Tools”. The project is managed by ENSI - Norway and the Albanian-EU Energy Efficiency Centre (EEC) - Albania and implemented together with the National Agency of Natural Resources (NANR) and the Polytechnic University of Tirana (PUT).

2. Project Objectives & Main Tasks

The overall objective of project is to improve and increase the local capacities and skills on Energy Auditing of Buildings, and thus contribute to improved energy efficiency in the Albanian Building Sector. The project also aims at getting “Energy Auditing of Buildings” included as a subject into the Curriculum at Albanian Universities. The project includes three main tasks:

1. Adjustment of ENSI methods and tools on Energy Auditing of Buildings for Albanian conditions,
2. Training of trainers in applying ENSI methods and tools in development of real building projects,
3. Further training of local specialists and education of university students.

All Albanian partners will be involved in the whole process of adjusting the methods and tool (incl. software for energy and profitability calculations), and in the “training of trainers” programme. In this way local specialist will be able to offer professional consultancy services in the market. The further development of laws, regulations and standards for the building sector can also be supported and improved.

3. Project Implementation

The programme consists of three workshops/training sessions, and the trainers will use the ENSI methods and tools to develop Energy Audit Reports for 5-6 suitable building projects. At the start-up of the project in November 2007, an “Energy Auditing Team” was established, consisting of 11 specialists representing: EEC; NANR; PUT, Faculty of Mechanical Engineering; PUT, Faculty of Electrical Engineering; Institute of Buildings; Ministry of Economy, Trade and Energy; and Individual Consultants. To conduct Energy Auditing, it is necessary to perform professional energy calculations as well as profitability and cashflow calculations. To assist engineers and technicians in quick energy calculations, ENSI has developed the Key Number Software. For profitability calculations, ENSI is providing their Economy Software. At Training Session 1, the participants were provided the first part of a comprehensive package of training materials, and a draft Albanian version of the ENSI Key Number Software for energy calculations. Exercises were performed with the Software, demonstrating how useful it would be also for Albanian conditions. At Training Session 1, the participants were divided into groups, which will develop Scanning Reports for 5-6 different building projects, and present them at Training Session 2, which is scheduled to be conducted in January 2008. After the Training Session 1, a guest lecture on “Energy Auditing of Buildings” was given at the PUT, Faculty of Mechanical Engineering for 15-20 students of the fifth year. The University is

interested in including the subject into their Curriculum, and install the software at their computer room, allowing students to work with it during project work.

4. Expected Outputs

The project will provide the following output:

1. Albanian version of ENSI Software and Energy Auditing Manual,
2. Minimum 10 trained experts that will be able to: offer professional services as Energy Auditors; offer training programmes for other Albanian professionals; offer education on Energy Auditing of Buildings for students; provide input for a better strategy and laws, regulations and norms for energy efficiency in the Albanian building sector.



M.Sc. Trond Dahlsveen
President
ENSI® - Energy Saving International



Iva Holubova
Project Manager

EXPECTED CLIMATE CHANGES AND THEIR IMPACTS

An increasing body of observations gives a collective picture of a warming world and other changes in the climate system (IPCC, 2001 - The Science of Climate Change). Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (IPCC, 2007 - The Fourth Assessment Report). The world's average surface temperature has increased by around 0.74°C over the past 100 years (1906 - 2005). This figure is higher than the 2001 report's 100-year estimate of 0.6°C due to the recent series of extremely warm years, with 11 of the last 12 years ranking among the 12 warmest years since modern records began around 1850. A warming of about 0.2°C is projected for each of the next two decades (4AR IPCC, 2007). The climate change scenarios developed for Albania in the frame of Second National Communication to the UNFCCC, predicate that global climate changes will affect Albania with increased average temperatures and decreased precipitation. Thus milder winter, warmer springs, hotter and drier summers & autumns is likely to be expected. In 2025 an average increase of 0.8°C is expected for winter and spring, of about 0.9°C and 1.3°C for autumn and summer. A similar trend is expected for the years 2050 and 2100. An average increase in annual temperature up to 2.0°C (2050) and 4.0°C (2100) is expected as well. A high warming up to 2.8°C (2050) and 5.6°C (2100) might be expected during summer. For precipitation, the annual scenario leads to a decrease of annual value (average) up to 3.0 %, 6.1 % and 12.4 % for the 2025, 2050 and 2100 time horizons. A drastic decrease in total precipitation is likely to occur in summer. This average decrease is likely to reach up to 9.9 %, 20.5 % and 41.3 % re-

spectively. These likely changes in the regime of temperature and precipitation are expected to lead in a cascade of changes in other climatic parameters. So, it is projected to be a general drying over Albania during summer. This is ascribed to a combination of the increased temperature and potential evaporation that is not balanced by the precipitation. Recent investigations show that increasing temperatures will be followed by increase of probabilities of extreme events and a higher intra-annual variability of minimum temperatures (Second National Communication to UNFCCC - draft report). Increases more in daily minimum than maximum temperatures are likely to occur. More frequent and severe droughts with greater fire risk are likely. It is to be pointed out that with higher average temperatures in winter expected, more precipitation is likely to fall in the form of rain rather than snow, which will increase both soil moisture and run-off. The extreme high increase in summer temperature is likely to result in increases to the frequency or intensity of extreme weather events (heat waves). It will have drastic consequences on all socioeconomic systems, especially in energy production. The most important climate change effect is a change in the timing of stream flow through the year. As contributors to hydrological systems, rainfall and snow and their potential changes in warmer global climate will have profound impacts on streams and rivers. Higher temperatures will shift the snowline upwards; the seasonal patterns of snowfall are likely to change with the snow season beginning later and ending earlier. So, the spring runoff is expected to get reduced significantly. The maximum reduction accounts for 30 % and 66 % respectively by 2050 and 2100. A likely reduction of 20 % in natural water runoff was projected to cause a reduction in power generation of 60 %, whereas a 20 % increase was projected to cause an increase in generation of 40 %. Hydropower industry must take into consideration the expected runoff reduction in electricity generating because Albania is dependent on hydropower.

Climate change is likely to affect the major electric end uses such as space heating, air conditioning, water heating and refrigeration. Warmer winters would reduce "heating degree days" and the demand for heating energy. On the other hand, the increases in air temperature are also projected to lead to increase in the "cooling degree days". Such a tendency would enhance the urban heat island effect and thereby heat stress. Increased demand for irrigation water also would augment the demand for energy. As a result of general warming and reduction in electricity produced by the hydropower plants year-round, there is recommended to take necessary measures to compensate the deficit in hydropower generation by other energy resources. For more details relating to the likely impact of climate changes in all social and economic sectors in Albania, please visit the Climate Change Program/Unit website (TheFirst National Communication, www.ccalb.org).



Prof. Dr. Eglantina Demiraj Bruçi
Head Climatological Division
Hydrometeorological Institute

PROJECT "INSTALLATION OF SOLAR SYSTEMS FOR CAPACITY BUILDING, TECHNOLOGY DEMONSTRATION AND RESEARCH WORK AT POLYTECHNIC UNIVERSITY OF TIRANA - ALBANIA"

1. Background & Potential of Solar Energy

The geographic position of Albania and its Mediterranean climate provide favourable conditions for the successful development of the solar energy. The high intensity of solar radiation and its duration, temperature and air humidity, etc., will contribute to this. The Mediterranean climate with mild winters and hot and dry summers make Albania a country with higher potential for the utilisation of solar energy than the average. According to the measurements on the solar radiation carried out by the Hydrometeorological Institute that are based on the data of nine meteorological stations, under the conditions of the geographic belt where the meteorological stations are located, the total annual solar radiation varies from a minimum of 1,185 kWh/m² in North Eastern part of Albania (Kukes) to a maximum of 1,690 kWh/m² in the South Western part of Albania (Fieri). So, the average annual solar radiation in Albania is 1,450 kWh/m². In addition, from the same measurements appears that the average daily solar radiation varies between 3.2 kWh/m² per day in the North Eastern part of Albania (Kukes) and 4.6 kWh/m² per day in the South Western part of Albania (Fieri). The average daily solar radiation for the whole country is 4.3 kWh/m² per day. It is to be mentioned that most of Albanian population lives in the western part of the country.

Compared with the average daily solar radiation in Netherlands of 2.5 kWh/m² per day, in Denmark less than 3 kWh/m² per day, in France and North of Italy about 3.8-4.6 kWh/m² per day, in Spain, South of Italy, and Greece more than 4.6 kWh/m² per day, Albania has the average daily solar radiation of 4.3 kWh/m² per day. As we can see from these values, Albania must be considered as a country with a good solar energy regime and a great potential for solar energy utilisation.

Most areas of the Albania benefits more than 2,200 hours of sunshine per year, while the average for the whole country is about 2,400 hours of sunshine/year. The Western part of Albania receives more than 2,500 hours of sunshine/year, while in Fieri 2,850 hours of sunshine/year has been recorded. The number of sunny days varies from an average of 240-260 days/year to a maximum of 280-300 days/year, in the South Western part of Albania.

Benefiting from the abundant sunshine and large number of sunny days, the solar energy market should be developed in Albania and so, the solar energy should be successfully used to provide hot water for sanitary needs in different sectors such as residential, hotels, hospitals, and for technological needs in the industry. These are the reasons that in Albania more interest should be dedicated to solar energy utilization for producing hot water for sanitary and technological needs as one of the most effective ways not only for saving the electricity consumed for this service up to now, but also for reducing the energy demand towards the overloaded system of electricity

distribution. In this framework, the role of education, capacity building and technology demonstration among the young generation as well as the general public is of vital importance.

Under such circumstances, feeling the responsibility of the role to play, the Albania-EU Energy Efficiency Centre (EEC) in collaboration with the Polytechnic University of Tirana (PUT) and financially supported by the Spanish Agency of International Cooperation (AECI) - Tirana Office, in the framework of the project "Installation of Solar Thermal and Photovoltaic Systems for Capacity Building, Technology Demonstration and Research Work at Polytechnic University of Tirana - Albania", intends to carry out a set of activities to support the solution of the above-mentioned issues.

2. Project Description

This project aims at increasing the role of education, capacity building and technology demonstration among the young generation as well as the general public. This project consists of the following components:

1. Capacity Building / Training,
2. Technology Demonstration / Research Enhancement,
3. Advertisement of the Solar Energy Utilization.

The Capacity Building / Training Component will comprise of Two Training Course, as well as the Communication Activities. The Technology Demonstration / Research Enhancement Component will comprise of the installation, at Polytechnic University of Tirana, of a Solar Thermal System (Pilot Plant) and a Solar Photovoltaic System (Pilot Plant) in order to have a practical example and contribute to the laboratory research / work of the Faculty of Mechanical Engineering and the Faculty of Electrical Engineering. In addition, the Solar Systems will contribute to the evaluation of the potential for solar energy utilization for the production of hot water for sanitary and technological needs as well as for production of the electricity in the Albanian conditions. In more details:

1. Component 1 - Capacity Building Component. This component will be delivered by the relevant Spanish Experts, as well as by local experts - EEC staff. At the premises of the Faculty of Mechanical Engineering, the Energetic Department, will be organised a training course on the "Basic, Commercial and Advanced Course in Thermal Solar Energy". At the premises of the Faculty of Electrical Engineering, the Electric Engineering Department, will be organised a training course on the "Basic, Commercial and Advanced Course in Photovoltaic Solar Energy". In addition, a Communication Plan will be implemented, including: mailings, web site, promotion, teaching materials and leaflets.

2. Component 2 - Technology Demonstration / Research Enhancement Component. This component will be implemented by the relevant Spanish Company, EEC staff as well as the technicians at Polytechnic University of Tirana. Solar Thermal System, which converts sunlight into heat, can be used for hot water production, under-floor heating and heating of swimming pools. The Solar Thermal System (Pilot Plant) will be supplied by a Spanish Company. This system will be installed at the Faculty of Mechanical Engineering, the Energetic Department - Section of Thermodynamics and Energetic. This

system will be used to improve / enhance the education programs in order to have a practical example and contribute to the laboratory and research work. Thus, such system has to be completed with monitoring/measuring points and other necessary equipment for the laboratory and research work. Solar Photovoltaic System, which converts sunlight into electricity, can be used for irrigation, pumping systems, public lighting, etc. The Solar Photovoltaic System (Pilot Plant) will be supplied by a Spanish Company. This system will be installed at the Faculty of Electrical Engineering, the Electric Engineering Department - Section of Electric Power System. This system will be used to improve / enhance the education programs in order to have a practical example and contribute to the laboratory and research work. Thus, such system has to be completed with monitoring/measuring points and other necessary equipment for the laboratory and research work. The beneficiaries institutions are the Faculty of Mechanical Engineering and the Faculty of Electrical Engineering, and this project will be implemented at PUT, 4 "Mother Teresa" Square, Tirana - Albania.

3. Component 3 - Advertisement and Promotion of the Solar Energy Utilization in Albania. The project also includes the organisation of an awareness campaign and promotion on the advantages of solar thermal and solar photovoltaic systems for the production of hot water for sanitary and technological needs as well as for production of the electricity, the benefit on environment, etc. The awareness campaign will consist of the following activities: Leaflet - to be distributed to interested stakeholders; Poster - to be distributed to interested stakeholders; TV Spot or Documentary Film - to be broadcasted on national and local level; TV Round Table Discussions - to be broadcasted on different TV channels.

The EEC believes that this Awareness Campaign should not only make aware the general public about the necessity of utilization of solar energy but should also initiate the active participation of the population and young generation in the solution of these important and vital problems for the Albanian society. It's evident that the Promotion of Solar Energy Applications to the general public can't be considered as a means (manner) that can change radically the situation, but it's an efficient means that can change gradually the human behaviour and consequently brings sustainable and long-term improvements.

All activities of this project will be implemented in close coordination with the relevant Spanish Company (manufacturer of solar thermal and photovoltaic systems) and the PUT.

(.....continued on next issue.....)



Dr. Eng. Edmond M. HIDO
Director
Albania-EU Energy Efficiency
Centre