



# THE ENERGY IN ALBANIA



Qendra e Eficiencës së Energjisë Shqiptëri-DE  
Albania-EU Energy Efficiency Centre



## THE ENERGY IN ALBANIA (NEWSLETTER)

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### INTRODUCTION OF ENERGY EFFICIENCY CONCEPT IN PUBLIC BUILDINGS STOCK OF KORÇA DISTRICT

( .....Continued from previous issue..... )

#### *Energy Data on Public Buildings Stock*

The public buildings stock is an important energy-consuming sector in the Korça District. The main weight of consumption is formed by the energy consumed in health and educational institutions. The total energy consumption for the public buildings stock in the Korça District, for 2002, has been 14.55 GWh. The biggest amount has been consumed by hospitals and schools followed by kindergartens. In general, it is evident that the consumption of firewood in the public buildings of the district is very high, while the penetration of diesel and especially LPG is low. Electricity is also used for space heating.

#### *Analysis of Energy Situation in Public Buildings Stock*

To perform the analysis, the energy consumption of the public buildings sector is divided into five parts describing as much basic energy uses with widely differing characteristics: space heating, space cooling, water heating, cooking, lighting and electrical appliances. Following are presented the results of the analysis related to the energy demand for the public buildings stock, during a year, assuming that the consumption is done according to European standards. The assumption considers the fulfilment of normal conditions of living, energy building code require-

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## NEWSLETTER

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ments, improvement of lighting, introduction step by step of central or district heating, etc. If we summarize the results of the analysis, the energy required to meet the demand for each service is:

1. Energy requested for space heating will be 14.27 GWh/year. The main contribution will be from oil.
2. Energy required for cooling will be 0.89 GWh/year.
3. Energy required for hot-water will be 3.51 GWh/year.
4. Energy required for cooking will be 1.57 GWh/year.
5. Electricity required for lighting will be 0.49 GWh/year.
6. Energy required for appliances will be 1.10 GWh/year.

The real energy requested in the Korça District to meet all services, in normal conditions, will be 21.82 GWh, while the real energy consumption in 2002 has been 14.55 GWh. As a conclusion of this analysis, it can be underlined that actual energy sources consumption is 66.7 % of the total energy needed for all the group of the public buildings stock in the Korça District.

### *Analysis of Energy Costs*

To analyse the future development has been assumed that all the buildings will fulfil the normal conditions of living, energy building code requirements, improvement of lighting, introduction step by step of central or district heating, etc. As explained below, three scenarios are considered until 2030:

- In the first scenario, the structure of energy supply will remain as it is actually, the main contributors are fuel-wood with 56.55 %, diesel with 24.58 % and electricity with 18.67 %.
- In the second scenario, the structure of energy supply will take into consideration the reduction of fuelwood from 56.55 % up to 10 %. Fuel-wood will be substituted by electricity, which will be increased from 18.67 % up to 55 %, and low-level penetration of LPG, HFO and Diesel.
- In the third scenario, the structure of energy supply will take into consideration the reduction of firewood from 56.55 % up to 10 % and electricity from 18.67 % up to 15.84 %. These sources will be substituted by high-level penetration of LPG, HFO and Diesel.

The comparison of the results for three scenarios shows that the third scenario has the lowest costs. The conclusion is that, for Korça District, it is very important to take all necessary measures for the introduction of central & district heating systems fuelled by diesel and HFO.

### *Evaluation of GHG Emissions*

The analysis is based on IPCC recommendations, GACMO programme and LEAP model. The emissions of CO<sub>2</sub> equivalent, SO<sub>2</sub>, NH<sub>x</sub> and CH<sub>4</sub> are calculated according to the scenarios described above. The comparison of the results for three scenarios shows that the third scenario has the lowest emissions.

### **3. Implementation of Energy Efficiency Measures**

Firstly, the EEC has prepared the database of the public buildings with all the necessary data with regards to their volume and surface, energy consumed for different services, number of people frequenting them, geographic location, social importance, type of activity performed, etc. After that, the EEC has undertake the evaluation of each group of buildings and each building in order to select ten of them for further study and per-

forming detailed energy surveys and audits. After careful evaluation of the above factors and continuous consultation with the beneficiaries, stakeholders, interested and involved persons and institutions as well as the steering committee of the project, the following ten buildings has been selected for further study: Orphanage "Lulet e Vogla", Sanatorium of Korça, School "Naim Frasheri", Kindergarten No. 17, District and Prefecture Building of Korça, Medical Centre of Drenova, Municipality of Maliq, School of Mollaj, School of Vreshtas, School of Bregas. A series of detailed energy surveys and audits has been performed for the selected buildings and again, their results (technically, economically and socially) has been evaluated in order to select three to four of them for implementing the energy efficiency measures.

The energy savings and CO<sub>2</sub> equivalent reduction for each measure and for each building are shown below. The biggest energy savings and CO<sub>2</sub> equivalent reduction has resulted from thermal insulation of outside walls, followed from thermal insulation of roofs and terraces, and after that all other measures. By listing the four first buildings according to total energy savings has resulted:

- Sanatorium of Korça with an energy savings of 1,005 MWh,
- School "Naim Frasheri" with an energy savings of 1,004 MWh,
- Orphanage "Lulet e Vogla" with an energy savings of 696 MWh,
- Municipality of Maliq with an energy savings of 302 MWh.

The total energy savings for the four selected buildings has been 3,007 MWh. Based on simple calculations, the pay back period is about 5.3 years.

By listing the four first buildings according to CO<sub>2</sub> equivalent reduction has resulted: Sanatorium of Korça with a total of 356 tons CO<sub>2</sub>, School "Naim Frasheri" with a total of 327 tons CO<sub>2</sub>, Municipality of Maliq with a total of 202 tons CO<sub>2</sub>, and Orphanage "Lulet e Vogla" with a total of 111 tons CO<sub>2</sub>.

After the analysis of the above-mentioned factors and other factors such as social impact, the interest of local government, geographic location, situation and possibility of intervention, etc., the above-mentioned buildings has been approved for implementing the energy efficiency measures. The budget allocated for the implementation phase has been around 74,000 USD. With this budget has been performed the following energy efficiency measures:

- Thermal insulation of external walls 1,464 m<sup>2</sup>,
- Thermal insulation of roofs/terraces 1,476 m<sup>2</sup>,
- Double-glazed windows/doors 202 m<sup>2</sup>,
- Energy efficient lighting 150 pcs,
- Civil and other necessary works.

### **4. Final Remarks**

The project has started in June 2003 and has been implemented by the Albania-EU Energy Efficiency Centre until August 2004. The project has demonstrated the advantage of applying energy efficiency measures through an accurate quantitative and qualitative analysis as well as has indicated the practical technical and social impact, and benefits of energy use against the baseline of the pre-project situation.

It is clear that the benefit from the implementation of the energy efficiency measures will be double. The part of budget of local administration for the energy expenses will be smaller and the comfort of people frequenting the buildings (especially children, patients, etc.) will be improved. As a result, more money will be available for other more important services for the community. Based on project experience and results as well as on the regional best practices, as an output of this project, EEC has elaborated and delivered a short handbook to be used as guidance for energy efficiency measures and utilization of local energy sources at local administration level. The staff of EEC has disseminated the project final results to other regions of the country and among relevant governmental institutions through two seminars organized respectively in Korça and Tirana.

Now EEC is advocating for the potential increase of energy savings and improvement of energy supply through the application of energy efficiency measures in a large scale.



**Dr. Eng. Edmond M. HIDO**  
**Director**  
**Energy Efficiency Centre**

## **ALBANIA AND KYOTO PROTOCOL OF THE UN CONVENTION ON CLIMATE CHANGE**

Albania is a Party to the UN Convention on Climate Change (UNFCCC) as of January 1995, and as of December 2004 Albania's Parliament adopted the draft law on ratification of the Kyoto Protocol. The Kyoto Protocol, adopted in Kyoto of Japan, whereas got the name, makes as a milestone in the attempts of the international community to protect the global environment from the greenhouse gas emissions and achieve the sustainable development. This Protocol set legal targets to cut emissions for developed country parties or so-called Annex I Parties of the UNFCCC. According to the Protocol developed countries have to cut their emissions by 5.2 % for the first commitment period 2008-2012 relative to 1990 levels. The Protocol itself enters into force after the ratification from at least 55% of the parties that would represent at least up to 55 % of the global greenhouse gas emissions. After ratification of the Protocol from Russia and the submission of the ratification instruments from Russian Duma, the ratification of the Kyoto Protocol is just a matter of days. It has entered into force on February 16, 2005.

In the heart of the Protocol stand the so-called "Cooperative Mechanisms" that aim at reducing the greenhouse gas emissions at lower cost. According to the Protocol does not matter where the reductions have been made but it is important they have been made somewhere at an effective and economically acceptable cost. There are three mechanisms proposed by the Kyoto Protocol: (i) Joint Implementation; (ii) Emission Trading; (iii) Clean Development Mechanism (CDM). Of these three mechanisms, given the status Albania has it is

eligible for the CDM only. This mechanism enables developed countries that are Parties to the Protocol, to reduce shares of their emission targets at lower cost through funding of projects that transfer new technologies to the non - Annex I Countries (like Albania). In turn, these projects besides the transfer of new and clean technologies will promote the sustainable development in non - Annex I Countries.

Ratification of the Kyoto Protocol from Albania will serve mainly to promote the sustainable development through the promotion and diffusion of the new and clean technologies, protection of the environment at national and global level by accepting that the global nature of the climate changes requires a wide cooperation among countries according to their common but differentiated responsibilities and in the line of their socio-economic circumstances. This ratification would not bring any financial implications to Albania due to the status that our country enjoys (non - Annex I), which does not bring any emissions reduction target. By the other side, the ratification enables Albania that through CDM mechanism attract new investments / projects in the field of energy, transport, environment, forests, etc., by facilitating the implementation of the sectorial action plans that derives from respective strategies. This is the case of the National Energy Strategy, which reflects very well environmental concerns, particularly climate change related concerns such as greenhouse gas emission reduction. This strategy has highly stressed the need of ratification of the Kyoto Protocol by Albania. This ratification is also in line with the policy of the EU that has already ratified this Protocol and four years ago has started the implementation of an action plan to achieve a target of reduction of 7 % of 1990 levels by the period 2012.

After the ratification of the Protocol, the next step to make it operational is the establishment of respective institutional structures that would propose, follow up and monitor the CDM projects that would be funded under this mechanism. A special attention for the CDM projects will be paid to the inventory of greenhouse gas emissions. The contribution of each country to the global warming is measured with the so-called Greenhouse Gas Inventory. This inventory must be reported to the Conference of Parties (CoP) of the UNFCCC, which decides the reporting year, that must be the same for all countries for comparative purposes. So far, Albania has reported for the year 1994 according to the 10<sup>th</sup> decision of the Second Session of the CoP. According to this inventory, funded by the Global Environment Facility (GEF), from the Albania's territory have been rele-ased about 7 million ton CO<sub>2</sub> equivalent GHG emissions or 1.9 ton per capita. These emissions values are relatively low compared to other countries and are justified with the fact that around 95 % of the electric power is generated by Hydro Power Plants. According to the First National Communication (FNC) Report of Albania to the UNFCCC, the energy sector, mainly fuel combustion is found to contribute at higher share (60 %) against the total. Energy is then followed by Agriculture (27 %) and Waste (5 %). Although Albania's contribution to the global warming is at low levels, referring to the scenarios of emissions developed under the FNC, it is expected that the emissions level for 2004 to be 8,4 million ton CO<sub>2</sub> equivalent, while for 2015 the emissions level to be at least 5 times higher compared to 1994. The CDM can contribute to that point.

As per the credits of CO<sub>2</sub> emission, they would belong to developed countries only that would fund projects under the Kyoto Protocol. For example, if a developed country funds a project under the CDM in Albania, this country will obtain credits called Certified Emission Reduction (CERs) according to the rules set by the Executive Board of the CDM. These credits will be accounted in the basis of the emissions reduced in Albania through this project. Albania is not eligible for such credits as long as it will be non - Annex I Country of UNFCCC. But, Albania benefits the project, which helps it to be developed in a sustainable manner.



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**Ministry of Environment**

### **ESTABLISHMENT OF RE FUND FROM "KfW" TO SUPPORT PRIVATE OPERATION OF SMALL HYDROPOWER PLANTS IN ALBANIA**

The private operation of Small Hydropower Plants (SHPPs) in Albania was initiated in 1999 with the promulgation of a law permitting the privatisation of state assets in the electricity sector. The privatisation of the SHPPs, which were operated by KESH, was initiated and undertaken by the Ministry of Economy and Privatisation/Albanian Agency for Privatisation, followed by the Ministry of Industry and Energy. The contractual arrangements for the private operation are: ROT - rehabilitate, operate and transfer; ROO - rehabilitate, own and operate; BOT - build, operate and transfer; BOO - build, own and operate. The potential of identified medium & small sized HPPs in Albania is estimated to be about 180 MW at 127 identified sites. At the date of reporting, the HPPs under private operation were:

1. Three medium sized HPPs of a total capacity of 14.0 MW (given in concession).
2. With regard to the 83 SHPPs, which were previously operated by KESH, the situation is:
  - 29 SHPPs - given in concession,
  - 16 SHPPs - privatised,
  - 22 SHPPs - planned for future privatisation,
  - 16 SHPPs - considered out of use, but there are expressions of interests for their private operation.
3. Ex-Albanian Institute for Energy (it was under KESH) prepared an assessment of 41 new sites for medium sized hydropower plants. It was reported that for about 10 new concession projects or sales, contracts were signed.

The Albanian Electricity Regulatory Entity is setting attractive selling/purchase tariffs, and the new price for 2004/2005 is 4.3 Lek/kWh (0.034 Euro/kWh). These tariffs are valid for one year. The commercial relations between KESH and the private operators were initiated only recently and only few power purchase contracts were signed up to now. The contracts have duration of one year. The importance of the SHPPs option for the Government is underlined by the fact that a positive environment, as described below, is created:

1. Flexible privatisation process: The privatisation is handled in a flexible way, this means that a number of legal and regulatory issues have still to be clarified in the future.
2. One-window approach: The applicants have only one contact within the Ministry of Industry and Energy; the dossiers and requests are then handed over to other Ministries.
3. Promotion: The import of required equipment is exempt from import taxes.
4. Price setting: The Albanian Electricity Regulatory Entity is setting attractive selling tariffs.
5. Payment discipline of KESH: There were no complaints with regard to the cooperation with KESH. KESH has paid the new private operators.

During the project work, the Consultant of KfW Bank had good working contacts with operators of SHPPs. They showed their interest and willingness to reactivate this neglected national energy supply option in Albania. The survey covered 13 operators, which were operating 36 SHPPs. In 2003 and 2004, the operators invested 244 million Lek or 2.0 million Euro. The operators financed these investments with their own resources. Some of them mention that they receive loans from business partners. The total planned investments in 2005 and 2006 are about 1,336 million Lek or about 15.66 million Euro. Considering an own participation of about 30 %, these investments plans would require a loan financing of 11.0 million Euro. In any case, without access to loan financing, these investments will not be realised. The answers concerning the institutional and legal context are:

1. Privatisation process: In general, the operators had no problems with the privatisation process.
2. Payment discipline of KESH: 11 of the 13 operators have no experience with regard to payments, only two operators stated that there are no problems.

The interviewed operators characterized lending attitude of the Albanian banks as follows:

- The banks require very high collaterals.
- Banks approached by the SHPPs operators refused to become involved in this new sector, which is considered as too innovative and not yet sufficiently developed.
- Electricity prices are fixed only for one year. There are no long-term price guarantees.
- The concession contracts cannot be used as a collateral.

In the next issue will be described the institutional structure regarding practical operation of this fund, that is proposed by the KfW Bank and approved by the Ministry of Industry and Energy.

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



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