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FEASIBILITY STUDY ON DISTRICT HEATING AND COMBINED HEAT AND POWER SCHEMES FOR LARGE HEAT CONSUMERS IN TIRANA

Background

In the EU countries, District Heating (DH) and Combined Heat and Power (CHP) is recognised to be one of the most important measures to save energy in the densely populated urban areas. These systems are highly developed in Northern Europe. The newest technological development is implemented and there is demonstrated an efficient institutional and financial set-up, which is important for the implementation of energy efficient least cost DH and CHP schemes.

It is also recognised that there is a huge potential for developing DH and CHP systems in the new democracies of CEEC. Although Albania is situated in a warm climate zone, there are in fact regions with very cold climate and in districts a densely building structure, which is a natural market for DH and CHP. There are more than 20 DH and 7 CHP systems in Albania and there is according to preliminary investigations a market for a further development. However the CHP and DH sector in Albania needs rehabilitation and suitable adaptations in equipment and operating methods in order to reduce further damage to heating and generating units and to utilise the potential for efficient and reliable heat and electricity supply. There are studies for new thermal power (only) plants and for the expansion of the existing power generating facilities. Therefore it is urgent to investigate the

potential for CHP before any binding decision is taken on development of power only capacity at sites, which have no alternative heat supply. Based on the general rule that District Heating (DH) is only economically feasible in buildings that are equipped with a hot-water central heating system, DH may be a viable option in colder urban areas of Albania.

Those schemes are effective from the economical point of view when they supply large heat consumers like student cities, big hospitals and new buildings blocks, which (on basis of an appropriate improved legislation) also will be heated by water based systems. Among Albanian energy institutions, the National Agency of Energy (NAE) and the Albania-EU Energy Efficiency Centre (EEC) are responsible for co-ordinating and investigating the technical and economic potential for covering the space heating requirements and electricity through the best energy supply scheme in those parts of the country, which have the long heating season by means of District Heating and Combined Heat and Power schemes.

Nordic Funds Unit through UNOPS Copenhagen Office has financially supported a project named Feasibility Study for Heat and Power, Albania. In the framework of this project were selected two sites: Student City and University Hospital Centre "Mother Teresa", both located in Tirana City. As foreign consultant was selected Dansk Energi Management A/S (DEM) of Denmark and as local consultant was selected the Albania-EU Energy Efficiency Centre (EEC).

Objectives of the Project

The overall objective of the project is to increase security of supply and energy efficiency of electricity and heat in Albania. The immediate objective of the study is to enable the National Agency of Energy (NAE) to take decisions regarding potential pilot projects within DH and CHP, and to develop a project document for a feasible pilot project in Tirana. A secondary objective is capacity building to enable the NAE to independently undertake similar studies in the future.

Activities under the Project

The specific activities are the following:

1. Evaluation of the projects impact in the light of Albanian National Strategy of Energy. Review of the regional institutional framework, the general local energy data, and relationship between local energy auto-producers and main energy utilities.
2. Meetings with the representatives of local authorities and existing local energy enterprises. Collection of the general data related to the sites such as maps, layouts, networks, number and type of the buildings, etc.
3. Conduction of detailed energy surveys and audits of the two proposed sites, including preparation of pre-feasibility studies of the two selected sites, with technical, financial, economic and environmental evaluations. The study includes: sites description; audits of fuel, electricity, heat and cold water consumption; audits of boiler plant houses; electricity distribution network; different energy efficiency measures to be implemented in the sites; etc.
4. Conduction of pre-feasibility analysis for both sites. The study includes: evaluation of the existing energy supply schemes; evaluation of costs for thermal energy and electricity supply

through existing boilers and electrical network (independent scheme); a comparison and justification of the choice of site; evaluation of CHP & DH energy supply and recommendations for the selected site based on technical, financial, indicators.

5. Review of possible sources of funding for the implementation of the demonstration project. Findings of this review could be taken into consideration in the choice of site.
6. Carry out full feasibility study of the chosen site, which includes: financial & sensitivity analysis; investment appraisal; implementation planning and budgeting; economic evaluation of the project.
7. Definition of methodology for division of fuel cost for electrical and thermal energy generated by CHP. Developing of methodology for tariff system including electricity and heat concerning CHP and DH. Approval of electricity tariffs and electricity imports and exports tariffs by Electricity Regulatory Body.
8. Carry out the training of Albanian specialists both locally and outside Albania. Local training will be on job training during the implementation of the project. A number of Albanian specialists, from NAE, Ministry of Public Economy and Privatisation, Albanian Power Corporation, and Electricity Regulatory Body, will be trained in Denmark by the Danish consultant. Such training will be based on western experience and include methodology for setting up tariffs for all kinds of fuel; thermal energy and electricity; institutional regulation framework for CHP and DH schemes.
9. Methodology and summary report of energy survey and audit for each site. The methodology and results of all analysis shall be described in the pre-feasibility and feasibility reports prepared upon completion of the tasks. The major criteria and basic parameters and calculations leading to the choice of the site shall be presented.
10. Arrangement of a workshop to present the project results to decision-makers and energy players in Albania.

Final Remarks

For the involved Albanian institutions, this project represents the first experience in DH and CHP schemes designing and implementation. As a first experience, the preparation of this feasibility study will quantify the level of the investments needed for DH and CHP sectors development, which are very important for improving the security of energy supply, the energy efficiency and to attract foreign investments in Albania. The precious support of UNOPS Copenhagen Office and the rich experience of Dansk Energi Management A/S are important for the successful preparation of this feasibility study. To obtain full benefit from it, it is necessary to succeed in attracting financing for implementation of a real project in the chosen site, which will be a real demonstration project and will help in training the Albanian experts in implementation, monitoring and supervision of such projects.



Dr. Eng. Edmond HIDO
Director
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ALBANIA POWER SECTOR REFORM - A PROJECT FINANCED BY USAID

Strategic Action Plan

The power sector is one of the most important components of the infrastructure in our country and electricity remains the main energetic resource to fulfil the growing demand of the industrial consumers, service sector and population. The high rate growth of electricity consumption (8-10 % per year) in all economic sectors, especially the tremendous growth of consumption of this energy source in the residential sector, in addition of lack of new generating capacities in last 15 years, have put in serious difficulties our electroenergetic system to provide a normal electricity supply to consumers, leading to a crisis during the year 2000.

The experience of the last years proved that the crisis management does not solve the problems; instead the preparation of long-term strategies for the development of the power sector is necessary. During its efforts to solve the crisis, the Ministry of Public economy and Privatization met the US Agency for International Development (USAID) support. USAID replied positively to a request for assistance, and it was agreed in principle to provide assistance to develop a long term-term action plan and strategy for the Albanian electricity sector. The Minister appointed a special Task Force to develop a comprehensive strategy to reform the power sector.

The Strategic Action Plan developed by the Albania Power Sector Reform Task Force (the "Plan") sets forth a series of steps that will transform the Albanian electricity sector and result in a strong, commercially-viable power supply market that will deliver power reliably at affordable costs. The thrust of the Plan is to initiate institutional reforms that will more clearly define the policy-making and regulatory roles of various government entities and create a market structure that will strengthen commercial operations through privatization and attract needed private investment.

The initial steps should be implemented during the first 3 years of the reform process in a number of phases. The Government is expected to recommend, and Parliament enact, a comprehensive energy law to provide a framework for sector reform. The law should identify new legal and institutional structures that will govern the power sector. Under the Plan the Government would begin to implement the necessary legal and regulatory reforms, strengthen the electricity regulator and ensure that KESH maintains its efforts to improve collections and reduce losses. An unbundling of electrical service into generation, transmission and distribution functions would be implemented, the number of separate distribution units consolidated, transmission tariffs rationalized and market rules established. Finally an experienced international investment advisor would be retained to advise the Government on the privatisation of the electricity distribution function.

The Actions of the Strategic Action Plan are given in a summarized way for each of five areas treated in the Plan.

1. Energy Policy and Legislation

The Government of Albania ("GOA") needs to adopt a comprehensive energy strategy. Under the Plan GOA will propose energy legislation that will clearly define the policymaking, planning and regulatory roles of government institutions and promote energy efficiency policies. Investment plans of KESH are to be based upon least cost planning principles in order to assure Albanian consumers that their electricity supply needs are met with a minimum financial burden on them.

2. Regulation and Tariffs

Under the implemented Strategic Action Plan, the Albanian Electricity Regulatory Authority (the "ERE") will be strengthened so that it can play its proper role under applicable Albanian law and implement energy policy, balancing the interests of electricity suppliers and consumers. The ERE should be solely responsible for reviewing and approving electric tariffs, protecting consumers, and for general oversight of KESH and other electricity market participants. The Government must also eliminate the economic distortions caused by subsidized electricity prices. Subsidized electricity prices have over-stimulated electricity demand, particularly for space heating, and discouraged the use of alternative energy sources. The wasteful use of electricity for heating has substantially contributed to an electricity supply shortage and diverted this valuable resource from commercial and industrial uses that would create jobs and contribute to economic growth.

3. KESH's Commercial Operations

Under the implemented Strategic Action Plan, KESH must continue the efforts to improve its commercial operations by ensuring reliable electricity supply, increasing collections of unpaid bills and reducing electricity theft. The failure to adopt and enforce basic norms of behaviour with respect to paying for electricity service, including payments by the Government and its budgetary institutions, means that KESH will not have the financial resources needed to maintain the existing electricity infrastructure or for new investments that are necessary to meet current and future electricity demand.

4. Market Development and Regional Issues

The Government should take all the necessary steps to develop an internal electricity market structure that will allow eligible consumers to choose their electricity supplier on a competitive basis consistent with the EU's Directive 96/92/EC, establishing electricity market liberalisation and opening of EU Member Countries and the Thessalonica Agreement, which provides for the establishment of a Balkan electricity market by 2006. The internal market should be designed to attract private investment and to be consistent with the development of a regional power market. In fact, such an internal electricity market structure is a prerequisite to Albania's ability to participate in a regional power market and obtain the advantages that go with such participation.

5. Privatization and Investments

Albania needs to attract private investment to fund the rehabilitation, expansion and modernization of electricity generation, transmission and distribution facilities. Privatization of electricity sector would create more opportunities to improve the market operations in this sector. The Plan defines the starting

time of privatisation for all electricity subsectors, generation, transmission and distribution. While the manner and form of privatization will be defined by a special law as provided for by the Law on Privatization of Strategic Sectors.

The approval of this Strategic Action Plan would serve as a guideline for the policies that Albanian Government will apply for the electricity sector development. In the same time this approval would represent an important step towards a transformation of this vital sector.



Zija KAMBERI
Local Consultant
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REGIONAL ENERGY PLANNING - A NEW CHALLENGE FOR NATIONAL AGENCY OF ENERGY

The National Agency of Energy (NAE) is an institution under the auspices of the Minister responsible for energy matters. NAE advises the Minister responsible for energy, the Government and other Ministries on energy matters. NAE performs analyses and evaluations of developments in the energy sector, makes assessments, prepares forecasts for Albania's energy demand, energy sources (oil and natural gas, coal, hydroenergy, fuel wood), drafts energy action plans, and performs follow-up work on such plans. NAE is responsible for overall planning of electricity and heat supply in Albania. Since the household sector is the biggest energy and electricity consumer, NAE co-ordinates an investigation of the technical and economic potential for covering the space heating requirements, in those parts of the country which have the longest and most severe heating season, by means of district heating, based upon the use of fuels or local energy sources combined with the introduction of central heating i.e. water based systems for hot water and space heating in the residential and service sectors.

In addition, NAE co-ordinates an investigation of the technical and economic potential for covering parts of the energy requirements for hot water by means of solar energy and biomass through central and district heating systems in those regions of the country where the solar radiation is most favourable. NAE is responsible for the development, implementation and monitoring of systematic energy management in public institutions. NAE is the only Albanian energy institution, which is responsible of database energy production, import, export, as well as for consumption side in national level and regional level. NAE has been supported by the European and American assistance with objective the preparation of Albanian Energy Strategy. From this assistance, the Staff of NAE has increased its capacity to undertake different projects for energy planning. During the preparation of the Strategy, the staff of NAE used and become familiar with the best software in energy and environmental planning, named LEAP (Long Alternative Energy Planning) and that has also in its focus

the utilisation of regional energy sources. The Staff of NAE has gained a great experience in evaluation of potential of regional energy sources as well as selection of the most feasible areas.

Resource optimisation within energy, water and other raw materials will become of increasing importance in the years to come, to the individual citizen, as well as to regions. To regional administrations in particular, resource optimisation will be of great importance within the fields of energy, water, waste and environment, since energy and environment are two of the major responsibilities of regions. As it was appointed above, much is done from the staff of NAE for optimisation of energy sources in national level, but a new and very important field of work is open: optimisation and promotion of regional energy sources having as the main goal the increased energy security of supply at national level, reducing energy budget at families and activities for each service and protecting regional environment. This regional energy planning will be applicable for individual houses, individual services, public buildings, small, medium and large enterprises inside the regions.

The Region of Korca is one of the coldest regions of Albania. The heating degree-days for this region are 2,190, which is almost one of the highest values in Albania. Also, in this region there are many rainfalls, snow, low temperatures that some times are lower than -26 °C and strong winds in some parts of the region. According to some preliminary calculations, this region has consumed 6.5-8 % of total primary energy sources of Albania. This is another reason that we decided to start to work in Korca at regional level. Korca Region includes this administrative Municipalities: Korca, Devoll, Pogradec and Kolonja. According to the administrative division, Korca Region has 6 cities and 347 villages. The total area of this region is 3,711 km². Korca Region's population is 355,317. Korca has 9 % of total population of Albania, and is the fourth region in the list, after Tirana 19 %, Fier and Elbasan 11 %. The share of population for Korca Region is 40 % in the cities and 60 % in the villages.

Based in NAE survey, the percentage of households having access to electricity supply for Korca Region is 99 %, but during the last years, due to electricity supply problems, the number of households which are supplied temporarily with electricity has achieved 61.3 %. The households sector is one of the important energy consuming sub-sector in Korca Region. Its importance is highlighted by the fact that it consumes large quantities of electricity and fuel wood, which has contributed to the country's current severe energy crisis. As a result, there was an over-cutting of trees and overloading of the electricity distribution system. Electricity is supplied to the Region by a 110 kV transmission line that is far away from the power plants bringing huge losses in the lines.

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

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