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***THE ENERGY IN ALBANIA***

# THE ENERGY IN ALBANIA

## (NEWSLETTER)

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## REGIONAL ENERGY DEMAND PLANNING PROJECT

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

### 3. Development of the National Energy Planning Models

The MARKAL/TIMES model is a flexible and comprehensive energy systems analysis platform that can analyze energy, economic and environmental issues at the global, national and municipal levels, over several decades. It provides a framework for exploring policy options and investment strategies that shape the evolution of an energy system. It is widely used in over 60 countries by more than 200 government, research and university institutions. The MARKAL/TIMES model can evaluate the costs and benefits incurred in the process of achieving various goals. The model does not forecast, but rather examines "what if" scenarios, highlighting the differences and requirements of each of the alternative development paths. The model accepts agriculture, commercial, industrial, residential, and transportation demands for energy services for the next several decades, and determines where the sources of energy will originate which technologies transform primary energy into final energy, and what end-use devices will then meet the demands for energy services. The components are tied together by means of a Reference Energy System (RES) which establishes the network of energy flows and technology options. The characteristics of each technology (supply, process, conversion and end-use) include the investment cost, operating and maintenance costs, service life, efficiency, availability and emissions.

**4. Capacity Building**

A primary objective of this USAID project has been the development of regional capacity to perform national energy system modeling and analysis. The TWG's capacity is demonstrated by their achievement of the following:

- Establishment of a 2003 energy balance, adapted to the model needs.
- Decomposition of the initial energy balance to determine the appropriate depiction of resources (including imports), conversion technologies, end-use devices and energy service demands, which formed the underlying Reference Energy System (RES) for each country.
- Calibration of the models' results for the base year (2003), including depiction of the capacity and performance of existing assets.
- Development of the 2003 to 2027 Reference Scenario,
- Preparation and analysis of alternate scenarios.

The following three policy scenarios were selected because they best demonstrate how the country energy systems might respond to a set of efficiency-promoting policies or programs. The selected policy scenarios were designed to model increasingly stronger efficiency targets as well as alternative economic mechanisms to provide insight in the costs and benefits of each approach.

- ***Promoting Energy Efficiency*** - accelerating the adoption of more energy efficient end-use devices through better consumer information, improved standards, market incentives, and other similar approaches.
- ***Reducing Electricity Consumption*** - achieving a 10% reduction in electricity consumption below Reference case levels by establishing regional, sectoral or other legal electricity use targets and implementing market-based mechanisms to facilitate meeting the targets.
- ***Reducing Energy Intensity*** - achieving overall energy system intensity improvements within the same lifetime energy system cost as in the Reference case, most likely through a combination of the above measures.

**5. Reference Scenario Highlights**

The Reference scenario describes how the energy systems will evolve absent any major changes in system direction (e.g., energy efficiency improvements, energy diversity), and as such it represents a continuation of the current situation scenario. The Reference scenario serves as the comparison point for the analysis of scenarios designed to model specific policies, programs and future energy system options. Each country Reference scenario has been established by:

- Developing demand service drivers (e.g., GDP, population) and associating them with each of the sectors to establish an initial projection of future useful energy services (e.g., space conditioning, cooking),
- Adopting forecasts of energy supply prices from the EU New Energy Externalities Development for Sustainability (NEEDS) project trends, adapted for each of the country situations by the TWG,
- Establishing an appropriate sets of future power plants, coupled heat and power, and heating plants as well as demand devices based upon IEA/ETSAP technology characterizations, adapted to the SEE situation, and
- Establishing mechanisms for "guiding" model choices in situations where there are limitations on system evolution that inhibit the selection of ideal economic choices.

**6. Future Energy Service Demands**

In the MARKAL/TIMES modelling framework, a distinction is made between the demand for energy services (or useful energy) and the end-use consumption of energy (or final energy). The demands for useful energy services are the key input driving the models, which then calculate the resulting consumption of final energy (electricity, gas, coal, etc.), and the host of resources and technologies that are utilized to deliver that energy as primary outputs of the model. The starting point for developing the national projections for future energy service demands is establishing the useful energy demand in the base year. The main drivers used are:

- GDP and GDP per capita growth,
- Population and number of household growth, and
- Industrial production growth, with a distinction between energy intensive sectors (ferrous & non ferrous metals, chemicals, and other energy-intensive industries), and other industries and services.

**7. Fuel Price and Availability**

Another key input to the models is the cost and availability of the domestic and imported energy resources available to the energy system. For the imported fuels, world energy price projections are used to compute their price evolution. For domestic mined or extracted resources, price trends were established that track the imported fuel prices, expect where local conditions dictate otherwise (e.g., cheaper mined coal). Fuel price trajectories were taken from the EU New Energy Externalities Development for Sustainability (NEEDS) project and adapted for the SEE situation. The price trajectories are based upon $60/barrel oil, which will understate the benefits of energy efficiency.

**8. Technology Characterizations**.

During model calibration, the stock and base year operation of the existing power plants (electric, coupled heat and power, heating) and end-use demand devices (furnaces, air conditioners, industrial process heat, lighting, etc.) was established within the models. The set of options was cross-checked against the published GIS information, and where needed the characterizations were adjusted to bring them in-line with what was used for the GIS. Each TWG then selected from this suite an appropriate set of new technologies for inclusion into their models.

**9. Model Constraints**

A MARKAL model is driven by its least-cost paradigm, which can sometimes lead to rates of change that are not reasonable within a real energy system. Therefore, limits on the rate and degree to which fuel switching may occur have been incorporated into the country models. In addition, there is a different set of constraints that limits the rate and degree to which the models can introduce new technology options. These constraint mechanisms are adjustable and can be relaxed or tightened as needed to model a particular alternate scenario. In the Reference scenario the penetration of advanced technologies (available from 2009 or after) was limited between 5 and 10 % depending on the country.

**10. Final Energy Consumption**

The aggregate Reference Scenario energy consumption grows

by 57 % during the course of the planning horizon. The results show that the greatest increase in end-use energy consumption will occur in the industrial and commercial sectors, with the residential sector consumption shrinking in percentage terms. Romania requires nearly half of all the energy consumed, followed by Serbia, Bulgaria and Croatia.

**11. Electricity Generation**

In aggregate, electricity generation in the Reference scenario increases from 157 GWh in 2006 to 288 GWh by 2027, an 84 % increase. This is consistent with the results if the World Bank Generation Investment Study (GIS), which projected 180-275 GWh of electricity generation in 2027, depending upon the scenario. In the current individual country models, imports and exports are capped at 2003 levels, and the benefits of greater regional integration cannot be assessed until the models are linked. The results show that the following changes in electricity generation by 2027:

- Coal/lignite remains the dominant fuel, providing 42 % of the total generation,
- Nuclear has the biggest increase, moving up to 20.6 % of the total generation,
- Hydro & gas-fired plants drop respectively to 21.9 % and 6.7 % of the total generation,
- Renewables and other plants move from nearly 0 % to 5 %, comprised of biomass, combined heat and power and wind.

**12. Primary Energy Supply**

The total domestic and imported energy required to meet the demand for energy services in the Reference scenario increases by 39 % in 2027 over all the region. Composition of primary energy use in the Reference scenario indicates that:

- Nuclear energy's contribution increases the most, from 8.9 % to 14 %.
- The roles of coal, oil, and biomass drop modestly; and
- Natural gas use holds fairly steady, with a slight increase in LPG use.

**13. Energy System Costs**

The total energy system cost encompasses all costs associated with the energy system, including expenditure on fuel, investments in new power plants and demand devices, and technology operation costs (other than fuel) over the 26 years of planning horizon. The results show that the eight countries fall into three clusters based upon the size of their energy system: (i) Romania, (ii) Bulgaria, Croatia and Serbia, and (iii) Albania, Bosnia and Herzegovina, Macedonia and UNMIK.

The total annual energy system cost reaches nearly • 40 billion per year in 2027. Fuel expenditures increase to • 25 billion per year by 2027, 80 % higher than 2006, and dominate the annual energy system cost. Annualized investments in technology reach almost • 15 billion in 2027, with power plants comprising • 3 billion and investment in demand devices requiring almost • 12 billion, nearly four times the capital needed for power plants.

As a conclusion, the scenario provides a quantitative assessment of the necessity to avoid the energy sector development according to the Reference Scenario. The main characteristic of the energy situation is the fact that self-sufficiency of each country with primary energy sources in general and with oil in particular is declining quickly. These factors will have a large effect on the energy trade balance, and consequently, on the country's general trade balance if the energy sector continues to be developed according to Reference Scenario. The need to import more fuels will increase the trade deficit beyond levels that the country economy could afford and those are the main reasons why introduction of energy efficiency and renewable energy sources is a must for all countries.

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## ESTABLISHMENT OF THE DESIGNATED NATIONAL AUTHORITY (DNA) IN ALBANIA AND THE CDM PROJECTS REVIEW AND APPROVAL PROCEDURES

The Clean Development Mechanism was established under Article 12 of the Kyoto Protocol adopted by the Third Conference of the Parties to the UN Framework Convention on Climate Change. It is a project-based mechanism aiming at the reduction or sequestration of greenhouse gases in the developing countries by attracting foreign investments towards sustainable development goals. The legal framework defining the mechanism comprises of the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the Marrakech Accords (FCCC/KP/CMP/2005/8/Add.1 and FCCC/KP/CMP/2005/8/Add.2 dated 30 March 2006). These international treaties together with the decisions adopted by the CDM EB define the international guidance for implementing CDM projects. The CDM has three main objectives:

1. To assist the developing countries in achieving sustainable development,
2. To contribute to the climate change mitigation, and
3. To assist the industrialised countries in achieving com pliance with their Kyoto targets.

During the last years the clean development mechanism matured significantly and gained great popularity amongst the buyers as well as the host countries. Up to now more than 1000 CDM projects have been registered by the CDM EB and more than 100 million Certified Emission Reductions (CERs) issued. The boost of this mechanism was triggered mainly by the decisions (all the decisions of the EB can be found on: http://cdm.unfccc.int/EB/index.html) taken by the CDM Executive board, which created the necessary prerequisites for the smooth implementation of CDM projects, including approved methodologies, designated operational entities, procedures for registration of projects, issuance of CERs, etc. On the part of the host countries interested in implementing CDM projects the governments should take the necessary actions to create favourable conditions for implementing CDM projects. These include fulfilment of the participation requirements for CDM

(e.g. appointment of a Designated National Authority), and adoption of national review and approval procedures.

Albania is a non-Annex I party to the United Nations Framework Convention on Climate Change (UNFCCC) and to the Kyoto Protocol and as such is eligible to host greenhouse gas (GHG) mitigation projects under the Clean Development Mechanism of the Kyoto Protocol. In Albania the responsibility of the Designated National Authority (DNA) falls upon the Ministry of Environment, Forests and Water Administration (MEFWA). This is initially formalized through a letter dated of July 2005 of the MEFWA and followed latter by a specific article of the amended "Law on forests and forests services" of July 2007. Despite of that, there was a need to formalize the functioning of the DNA in Albania and to set up formal rules and procedures for the CDM projects approval, which was finally fulfilled with the approval on 27 November 2008 by the Council of Ministers of the Republic of Albania of the Governmental Decree "On the establishment of DNA in Albania as part of the obligations of the country to Kyoto Protocol".

The above achievement is a very important step on the way to access carbon finance in Albania and to its prepa-ration, the Government of Albania has been technically supported in the frame of the project "Building capacities to access carbon financing in Albania" jointly funded by the Austrian Government through the Austrian Develop-ment Agency (ADA) and UNDP-Albania and as well as part of the assistance given from the Italian Government through the Italian Ministry for the Environment, Land and Sea with regards to the implementation of Kyoto Protocol in Albania. Other experiences of the countries with a similar status with Albania with regards to UNFCCC have also been consulted. According to this legal act, the DNA is established within the MEFWA, which is the responsible body for the UNFCCC and the Kyoto Protocol implementation, and consists of a Steering Committee (SC) and a Secretariat to perform supportive functions. The DNA responsibilities and functions are related to definition and implementation of the CDM policy of the country and evaluation and/or approval of the CDM project documents. Within the DNA the SC and the Secretariat perform differential but interrelated functions. The main functions of the SC are related to the approval of CDM projects and include:

- Coordinates at the international and national level the required actions for the implementation of the Kyoto Protocol,
- Ensures the compliance of the CDM project proposals with the requirements of national legislation and in line with the international regime,
- Authorize, when necessary, the involvement within the DNA, of other experts from the line ministries,
- Evaluates the CDM projects,
- Signs Letters of no Objection and Letters of Approval,
- Provides guidance to the Secretariat.

The main functions of the Secretariat include:

- Facilitation of the process of submission, evaluation and approval of the CDM project documents,
- Assisting the project developers in providing information on national and international guidance, formats, and other relevant materials,
- Reviewing officially submitted project documents (e.g. PIN, PDD) and preparing evaluation reports,subject to decision making by the DNA Steering Committee,
- Make sure that the requests of the national legislation with regards to the environmental impact assessment are fully taken into consideration from the project developers,
- Integration of the suggestions/comments from the line ministries in the procedure of the CDM projects review/approval,
- Make sure the compliance of the CDM project proposals with the national sustainable development criteria,
- Preparing draft letters of no-objection and approval on the basis of approved format for issuance from the DNA.

The main participants in the CDM Project cycle are: the project developer, the DNA, the Designated Operational Entity (DOE), and the CDM Executive Board (EB). Their responsibilities are distributed along the project cycle and differ in time. While the DNA's main responsibility is to confirm that the host country has ratified the Kyoto Protocol, that the proposed CDM project meets the national sustainable development criteria and other relevant legislation, and that the project is undertaken on a voluntary basis, the DOEs are responsible for verifying the technical and legal aspects of the proposed CDM project, including the project's additionality, the GHG emissions baseline, and the monitoring plan. The main role of the CDM EB is to register and approve the projects according to the adopted international procedures, and to issue CERs. With regards to the project cycle, the Albanian Governmental Decree sets the procedures and the deadlines for the review and approval of the CDM projects proposals from the day of their submission to the MEFWA as following:

- Screening and endorsement of the project idea (PIN), a process which takes no more then 25 working days, time by when the project developer is provided with a Letter of No Objection,
- In-depth assessment and approval (PDD), a process which takes no more then 30 working days, time by when the project developer is provided with a Letter of Approval.

As a follow up of the mentioned Governmental Decree, and in order to make it operational, the MEFWA is authorised to issue the rules on how to review, approve and facilitate the implementation of the CDM projects. The draft set of those rules is already prepared and is under discussion within the interested stakeholders within the country. The approval of the Decision of the Council of Ministers "On the establishment of DNA in Albania as part of the obligations of the country to Kyoto Protocol", is a very important step that Albania has taken towards creating national institutional and legal framework to access carbon financing in Albania. The most important sector to profit from the Kyoto Protocol's flexible mechanism, with a great potential with regards to the CDM projects is the Energy Sector, with both Energy Efficiency Projects and Renewable Energy related ones.

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