# RES – INTEGRATION

## FP6 509204 RES Integration

DEVELOPMENT OF A STRATEGY FOR THE IMPLEMENTATION OF RES IN THE RESTRUCTURING AND DEVELOPMENT PLANS FOR WEST BALKAN

Collection of data and formulation of a strategy for RES – Integration

**WP 6 – Deliverable 11**

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RES-Integration is coordinated by Agricultural University of Athens (AUA), and has the following partners: WIP – Renewable Energies, Germany; ETA-Renewable Energies, Italy; MFKG – Masinski Fakultet – Kragujevac, Serbia; MAGA – Macedonian Geothermal Association, FYR Macedonia; PUT-Polytechnic University of Tirana, Albania.

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# CONTENT

# 1 Introduction

## 1.1 Background

The Western Balkans region comprises Albania, Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro and Serbia. Since the end of the Kosovo conflict in 1999, the region has made strong progress, outpacing Central Europe in economic growth with an average GDP increase of more than 5 percent in 2005. The markedly strong economic development is expected to continue in the next several years. Inflation has largely been kept under control, and is expected to decline further in the immediate future. As unemployment is still high, sustainable economic growth and job creation are the major challenges the region faces.

Improving the balance between energy supply and demand is crucial to boost and sustain economic development in South Eastern Europe. The implementation of renewable energy based technologies must be promoted, taking into account sustainable development criteria, including environmental objectives and exploitation of own resources. The financing of renewable energy projects can be realised through foreign direct investments, or through public funding. Large bilateral assistance is provided in the form of grants given by different donors.

The European Commission and the World Bank play a key role as coordinators of international assistance for the reconstruction and development of South East Europe (SEE).The joint World Bank -European Commission - Office for South East Europe, which is located in Brussels, facilitates donor coordination effort. In addition, high levels of assistance have also been provided by Multilateral and International Financial Institutions (eg, European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB) and the World Bank).

The Stabilisation and Association process (SAP) is the EU's policy framework for the Western Balkan countries: Albania, Bosnia and Herzegovina, FYR Macedonia and Serbia and Montenegro, including Kosovo. To help the SAP countries reach their objectives, the EU is by far the largest single assistance donor to the region. Since 1991, the EU has provided more than €6 billion to the Western Balkans through its various aid programmes. And by the end of 2006, that figure will have risen to some €10 billion.

As a development institution, the World Bank supports two broad goals in South East Europe (SEE): (i) poverty reduction and (ii) economic and social development, the latter in support of the countries ambition to join the European Union. In terms of financial assistance, over the period 1999-2005, the World Bank has been supporting the region through wide range of development projects, collectively amounting to approximately US $5.9 billion. These projects are directed towards a number of sectors, including: infrastructure and energy, private sector development, poverty reduction and economic management, social sectors, rural development and the environment.

## 1.2 Objective

The aim of this report is to formulate a strategy, how renewable energy (RE) and energy efficiency (EE) actions can be integrated into the large restructuring and development plans for the West Balkan Countries, and how RE and EE can be generally implemented.

## 1.3 Methodology of the Road Map Development

Within this report, the restructuring and development programs of the European Union and World Bank are analysed for Albania, FYR Macedonia and Serbia. Based on the analyses, country-specific strategies will be formulated how renewable energy actions can be integrated into these programs. Overall conclusions are drawn in the last part of the report.

A template was elaborated as a base for the formulation of a Road Map for the increased incorporation of RES into Restructuring and Development Programs and for increased implementation of RES/EE.

The report consists of three parts:

1. 'Country Presentation' in chapter 2.1, 3.1 and 4.1
2. 'Analysis Part' in Chapter 2.2, 3.2 and 4.3 where existing and future restructuring and development plans of the West Balkan countries are analyzed, and the possibilities for RES funding within these plans are identified.
3. 'Strategy Part' in Chapter 2.3, 3.3, 4.3 which formulates conclusions and strategy options.

The report was elaborated individually by the respective RES-Integration project partners:

- Albania by PUT
- FYR Macedonia by MAGA
- Serbia by MFKG

# 2 Road Map for RES/EE Implementation in FYR Macedonia

## 2.1 Country presentation

### 2.1.1 General Information

The Former Yugoslavian Republic of Macedonia (FYR Macedonia) is a landlocked country on the Balkan Peninsula in southeastern Europe. It is bordered by Serbia to the north, Albania to the west, Greece to the south, and Bulgaria to the east. The capital is Skopje, with 500.000 inhabitants, and there are a number of smaller cities, notably Bitola, Kumanovo, Prilep, Tetovo, Ohrid, Veles, Štip, Kočani, Gostivar and Strumica. It has more than 50 natural and artificial lakes and sixteen mountains higher than 2.000 meters (6.550 ft) above sea level.


*Figure 1: Map of FYR Macedonia on the European Continent*

The country is a member of the UN and the Council of Europe and a member of La Francophonie, the World Trade Organization (WTO), and the Organization for Security and Cooperation in Europe. Since December 2005 it is also a candidate for joining the European Union and has applied for NATO membership.

FYR Macedonia considers itself a relatively clean country, "since the level of pollution of the environment remains within the limits of tolerable technical parameters". (Black Sea Energy Review May 2000). Yet no targets are spelled out for Renewable Energy Sources, except for hydropower, presumably because of their concentration of shift ting to natural gas.

FYR Macedonia plans to harmonize its policies, including the ones on environment, with those of EU so as to promote closer integration with other European countries.

In December 2005, Macedonia was granted the status of a candidate for membership in the European Union. In the Council Decision of 30 January 2006 on the principles, priorities and conditions contained in the European Partnership with FYR Macedonia.

As regards energy sector following priorities are listed:

- Begin to align the legislation on the internal electricity and gas markets, energy efficiency and renewable energy sources with the acquis in order to gradually open the energy market to competition;
- Strengthen the independence of the Energy Regulatory Commission;
- Start implementing the Energy Community Treaty;
- Enhance administrative capacity in all energy sectors.

FYR Macedonia has signed the Treaty for the establishment of a European Energy Community in October 2005.

### 2.1.2 Renewable Energy

FYR Macedonia has promising indigenous resources of renewable energy. These include hydropower, geothermal energy, biomass energy, and in the longer-term wind energy. Even a though a pipeline of financially viable renewable energy projects has been identified by different project developers, these are not being implemented because of financial and institutional constraints

#### a) Wind Energy

The Renewable Energy Country Profile compiled by Black&Veatch for EBRD states that no direct information on wind energy was available. However, in the neighbouring Greece 336.7 MW of the licenses granted were for Macedonia-Thrace. Furthermore there is an interconnection between both countries and Greece would be interested to buy wind power from FYR Macedonia. The above-mentioned survey identified no industry association and no projects.

A countrywide wind-atlas is prepared, as a project funded by Electrical Power Company, and realized by USA Company. Necessary measurements are in the phase of realization in 3 quite promising locations, the project is funded by the Norwegian Government.

FYR Macedonia 's potential wind resources have not been exploited so far, largely because of its recent political and ethnic problems, which diverted economic and energy resources to satisfying the basic needs of the economy and population. The wider former Yugoslav area has been reported (Davor Skrlec, Enconet International) as having potential wind resources of about 15 PJ/year. Although less windy than many northern European countries, wind energy appears to be a viable renewable energy technology in Macedonia. Being characterised by high mountains (some of the highest in Europe), it is reported that there are locations, which have annual average wind speeds exceeding 7 m/s.

However, the precise potential and specific locations will need to be determined and assessed, before techno-economic feasibility studies, business plans and investment programmes are prepared. Judging by the Greek wind energy sites, the study by Black&Veatch estimates that Lake Doiran, South east of the country would probably be the best, followed by the area along the Greek border, in the south of the country.

#### b) Solar Energy

Solar irradiation in FYR Macedonia is amongst the highest in Europe. The most favourable areas record a large number of sunshine hours, the yearly ratio of actual irradiation to the total possible irradiation, reaching approximately 50 % for former Yugoslavia as a whole, or 45 % for the mountainous central regions, particularly in FYR Macedonia, due to the prevailing weather pattern. The primary form of solar energy and technology used are flat plate collectors for heating houses and some commercial and public premises.

However their contribution to the total energy consumption is insignificant (less than 1 %). Nor is it expected that this figure will increase substantially in the near future, as new consumption could mainly come from new entrants to the market i.e. of new buildings or installations. Likewise, electricity production from solar photovoltaic sources will be restricted to research or remote locations, primarily for telecommunications. PV solar energy is still 300-500 % more expensive than alternative fossil fuel derived sources.

*Table 1: Average Global Solar Irradiation on a Flat Surface in FYR Macedonia*

| Location/ Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bitola (kWh/m²/day) | 1.8 | 2.6 | 3.8 | 4.9 | 6.3 | 6.9 | 7.1 | 6.3 | 4.9 | 3.4 | 2.3 | 1.5 |
| Skopje (kWh/m² /day) | 1.5 | 2.4 | 3.6 | 4.7 | 6.0 | 6.5 | 6.8 | 6.0 | 4.6 | 3.2 | 1.9 | 1.3 |

### c) Geothermal Energy

FYR Macedonia derives useful energy in the form of heat from its geothermal wells. At present its geothermal water is used for heating greenhouses, residential houses, some commercial buildings, swimming pools and in balneology. No electricity is produced from geothermal energy in the country.

The main hydrothermal systems are located in the East and North East of the country in the crystalline rocks of FYR Macedonian-Serbian massive and are characterized by low TDS (total dissolved solids) and low corrosion activity. A number of geothermal areas composed by separate fields were discovered as a result of investigations from more than 50 prospecting and operating wells with a depth from 40 to 2100 m.

In the year 2003, 543 TJ of heat were produced. An assessment by the World Bank estimates the potential at 22 MWth

### d) Biomass

According to the qualification of primary energy resources by the Macedonian State Energy Balance (SEB), an average of 800,000 m3 per year wood provides about 2,660 GWh/year of energy. This is 8.9 % of the total primary energy source in FYR Macedonia according to the SEB estimate. There is a “theoretical” capacity of 6,000 GWh/year from wood. However, the SEB does not anticipate any increase beyond the current use of wood as an energy source. Wood is currently used only for residential heating. There are no plans to generate electricity from wood-fueled power plants. (Energy Sector Development Strategy for Macedonia, FINAL REPORT, 2000)

Currently, biomass covers about 6% of FYR Macedonia 's primary energy demand. Biomass is the second most important energy source for heating (after electricity). The majority of fuel wood is consumed by households. The Action Plan contained in the country's First National Communication to UNFCCC recommends to establish small district heating systems based on biomass and CHP in small rural municipalities. Provided a national afforestation plan is implemented, the growth of wood will be exceeding the demand of firewood.

In the period 1999-2001, the production of wood fuel and charcoal amounted to 787,000 m3, that of wood residues 3,638 m3.

While an increase of the use of wood as a fire fuel in the traditional form is not expected, this does not necessarily mean that there are no margins and prospects for a better utilization of forest output for energy purposes. Better forest practices, reforestation, planting of deserted or

marginal land could make a contribution, be it relatively small, to the further development of this sector. Moreover, as burning wood in the traditional way is quite polluting, there will be pressures for switching to other cleaner sources of energy, which would release fuel wood resources. This however, will be a slow process.

As far as exploitation of the residues of field crops, fruit tree plantations and livestock activities are concerned, there ought to be a significant potential for their collection and utilization, along with waste (incl. manures from intensive farms). This could be done through incineration or anaerobic digestion technologies. But special studies and surveys will have to be carried out to determine location, logistics, and size of units, economics and viability, likewise with MSW (Municipal Solid Waste) and the waste of sewage (sewage sludge).

*Table 2: Overall Energy Potential of Biomass and Municipal Waste in FYR Macedonia*

| Energy Resource | Theoretical Potential (GWh) | Percent of State Energy Balance | Technical Potential (GWh) | Percent of State Energy Balance |
|---|---|---|---|---|
| Forests and Forest Residues | 6000 | 20.00 | 2660 | 8.87 |
| Agricultural Residues | 2000 | 6.67 | 286 | 0.95 |
| Municipal Waste | 830 | 2.77 | 415 | 1.38 |
| Total | 8830 | 29.44 | 3361 | 11.21 |

**e) Hydropower**

According to the country profile on FYR Macedonia compiled by EBRD, the seven large hydropower plants in Macedonia have a totel capacity of 480 MW. The capacity of existing small plants amounts to 50 MW.

Production of electricity from hydropower has fluctuated widely during 1980-2000: from about 1850 GWh (159 ktoe) in 1980 to 848 in 1992 and 1389 in 1999, 626 and 757 in 2001 and 2002. In 2003, electricity generation from Hydropower was 1483 GWh (approx. 4 % of primary total energy production). The project of HPP Kozjak (80.5 MW) was completed in 2001. The HPP Project Sveta Petka (22.5 MW) is in the phase of building, downstream of the HPP Kozjak, as a part of the common project.

Also, few hydro projects are envisaged for accomplishing. Two of them are the storage facility in Lukovo Pole and an additional reservoir for the three existing downstream power plants in the Mavrovo system (HPP Vrben, HPP Vrutok and HPP Raven) and HPP Spilje 2 (72.8 MW), a new generating unit added to the existing HP Spilje.

FYR Macedonia is divided into 3 separate drainage units/areas, which are identified by their major, rivers:

- The Vardar River water basin/drainage area of 20.535 km2
- The Crni Drim River drainage area of 3.350 km2; and
- The Strumica River drainage area of 1.535 km2

According to a Master Plan prepared as long ago as 1976 and other studies made at a subsequent time, 'the technically usable' hydropower potential of the rives in the country are about 5.483 GWh.

## 2.2 Analysis of Restructuring and Development Programs

There is no officially accepted plan or program for development of RES in FYR Macedonia. They have been continually neglected, as it was the energy sector at all during the last 15 years. As result of such an approach, present situation is worse than the one before this period, when quite significant results have been achieved in comparison with the other parts of ex-Yugoslavia and neighbouring countries (large geothermal projects, two factories for production of solar collectors and components, three biogas plants, two briquetting plants, several small hydro-plants, etc.). Most of them are meanwhile abandoned. Illustration of the situation is the filled Questionnaire for candidature to EU, where is given the information that FYR Macedonia doesn't plan development of RES until 2030.

### 2.2.1 Existing Plans and Programs

World Bank and EU made several trials to enable correction of such an approach by financing preparation of several studies and by pressure to change the existing old Energy Law. Three particularly important and useful references, developed with EC funds are:

- Report, prepared in the frame of the EU Programme EU SYNERGY (2001), consisting of 6 volumes;
- Study "Possibilities for Investments in Energy Sector in Macedonia" (also in 6volumes), financed by the EU Programme PHARE2 (2003), and
- Plus, the "Strategy for Energy Efficiency of Macedonia", financed by the USAID, (2003).
- Most important conclusions can be summarized as follows:
- Macedonia has on disposal significant RES, which can be developed with the available technologies, already developed and proven in EU and USA.

A wider implementation of RES, particularly at local and regional level, can significantly improve the present bad energy situation in the country.

It is possible to implement already proven strategies of several EU countries and to reach significant benefits in rather short time terms.

It was also found that in FYR Macedonia doesn't exist any body which works on the problematic on RES and Energy Efficiency. The gaps to be covered where identified but that can be possible only if the country understands seriously the need of use of this energy source. Most significant one is the absence of responsibility for organization and governing the process of introduction of RES and Energy Efficiency in the state economy in a sustainable way.

The country should react quickly by establishment of an Agency for RES and Energy Efficiency development, in order to enable and systematic approach to the problematic, determination and efficient implementation of accepted strategies for development and related programs.

The list of constraints to realize any serious advance was identified as follows:

- There is a lack in capacity of personnel with necessary knowledge and experience in the field of RES and Energy Efficiency development;
- There is lack of strategies/initiatives, regulative and standards for RES use by final users and application technologies;
- There is still no defined political will to support the change of present situation.

Financing is one of the critical steps in the process of establishment of a successful energy programme. World Bank offered in 2003 an initial capital of 6.2 billion dollars for covering the costs of organization of the Agency and its initial activities. Unfortunately, up to now, government has not been able to establish it and there is the possibility to lose this funding if not making the first serious steps until the end of this year. Same destiny can be also with the Swiss funds for preparation of a National Strategy for RES Development. Funds are on disposal already 3 years but still not used.

The only positive results can be located in the realization of several internationally financed projects, as are the Reconstruction and Modernization of Geothermal System "Kocani" (three projects of altogether about 3.0 billion Euro, financed by the Austrian Development Agency, the same in Vinica with about 0,5 billion Euro and Development of Solar Collectors for Water Heating with about 0.3 billion Euro, also financed by ADA, Supporting the Implementation of Solar Collectors for Water Heating, financed by the Norwegian Government with about 0,3 billion Euro, etc. Also a Strategy for Removing Energy Poverty has been prepared, supported by the British government, however with quite poor quality and without real possibility for implementation. Previously issued document of the Government for the Strategy to remove the poverty of 2000 completely failed as the planned rate of average development rate of 6.0% annually has not been reached.

On the other hand, several international finance sources are on disposal for development of necessary strategies and, based on them, realization of implementation programs. The stabilization agreement between FYR Macedonia and the European Union defines (Article 99-2) that EU shall support the promotion of energy saving efficiency, renewable energy and studying the environmental impact of energy production and consumption. The Programme for reconstruction of West Balkan countries, through direct funding of concrete projects or coordination of donations of developed EU countries can contribute significantly. Also some scientific programs (FP7) are now opened for FYR Macedonia, enabling transfer of newest knowledge and participation in development of new one. Very convenient financing is on disposal from the EBRD and EIB. Same is the situation with the World Bank (IBRD), and many UN and other international organizations. However, as told, RES are still far of the interest of the national policy and economy, under the pressure of "more serious" problems of the country in difficult transition process.

Taking into account that no real development can be initiated without defined strategies for development, plans and programs for their realization, necessary legal background and supporting documents and financial sources to enable successful implementation, most urgent for the country is to begin finally with their preparation, incorporation in legal regulation and long-term and annual plans for development. Obviously, and based on the experience of the recent 10 years period, it shall not be possible without help of relevant international organizations and particularly of EU, as one of the important conditions to join it in near future.

### 2.2.2 Key Actors

Key actors, relevant for the RES development programs in FYR Macedonia are as follows:

**a) Government of the Republic of Macedonia**

Relevant for definition and implementation of development programs on regional, national and European level. Government is proposing new laws and supporting documents to the Parliament, also the budget composition with participation of costs for concrete actions realization. Government accepts or refuses initiatives of different ministries, international organizations, etc., and signs bilateral contracts for realization of internationally funded projects.

**b) Ministry of Economy of the Republic of Macedonia**

FYR Macedonia has not a separate Ministry of Energy. It is only a department of it, responsible to fulfill all the tasks connected to the work of energy sector in the country. It is relevant for definition and implementation of priorities in all economy sectors, of energy development programs, prepares proposals for new laws, strategies, programs, etc. to the government. It also directly participates negotiations with foreign donors and is responsible for their implementation.

**c) Ministry of Education and Science of the Republic of Macedonia**

Relevant for definition of state priorities in the field of science and education. It directly influence implementation of foreign support of proposed scientific and education projects, to be financed by foreign donors or in bilateral collaboration

**d) Secretariat for European Matters**

Relevant for coordination of foreign donations of the countries, members of EU, coordination and follow up of the use of programs and instruments of EU for support of the process of European integration of RM, and support to Ministries and other governmental bodies and preparation of proposals and projects for help and their implementation.

**e) ZELS (Community of Macedonian Municipalities)**

Relevant for definition and implementation of regional and local development programs and projects. Participate financially in realization of projects.

**f) Different NGO**

There are a list of NGO, trying to find an useful place in the preparation of strategies, definition of development plans and programs, connected to RES and Energy Efficiency. However, government still doesn't accept them as an relevant participant in the process of preparation and implementation of development plans and programs.

## 2.3 Formulation of Strategy Options for RES/EE Implementation

Based on the present situation and predicted needs of the country, obviously determination of any strategy of development should contain three main parallel directions of activities, i.e.:

1. **Determination of the whole and technically/economically feasible size of each one of RES** on disposal. After 1990 Macedonia has no activity in organized measurements and investiga-tions, i.e. all the data on disposal are old, incomplete and (in many cases) unusable. In con-nection with that, evaluation of importance of each RES for the country should be made and analysis of possible energetical/economical benefits.
2. **Preparation of a Strategy for development in three phases:**
   - Long term Strategy of Development, compatible with the Development Strategy of the Country, Strategy for Development of Energy Sector in FYR Macedonia and Strategy for Energy Efficiency Improvement of FYR Macedonia;
   - Middle Term Strategy of Development, based on the present information and data on disposal, Directives of EU and Kjoto Protocol Conditions, and Middle Term Strategy of Economy Development of the country; and
   - Identification of possible short term actions, needed for initialization of the process of development (legal background and instruments for implementation, removal of different constraints, definition of types of support, finance sources, etc.).
3. **Short Term Plans for direct actions and projects** for initialization of the process of development, connected to the international finance sources on disposal (realization of scientific and demonstration projects, development of IRES schemes, realization of already determined commercial projects, etc.).

Obviously, such an approach is quite complicate and difficult for implementation. It is not possible without determination of a special state body, responsible for organization and realization of consisted tasks. Taking into account that such a recommendation is in line with the foundlings of the studies, realized with support of World Bank and PHARE, the gap should be covered by finalization of the foundation of the Energy Agency, its completion with necessary personnel and funds for financing its work. Connected to its work, also instruments for maximal use of local experts (working at universities, different institutes and firms) should be defined in order to overcome the situation that only administrative personnel has real participation and direct influence to the activities implementation. FYR Macedonia is a small country and doesn't have on disposal complete experts teams, concentrated in separate institutions or firms. On the other hand, ministries do not practice (paid) engagement of own experts teams, composed only by competence of members and not by place of employment.

There is a list of constraints for to be overcome for organization of preparation of such documents and their implementation, i.e. incorporation in the national plans for development, i.e.:

FYR Macedonia still doesn't have a National Strategy for Development, which should give the base for preparation of the Strategy for RES development;

The same is with the Strategy for Energy Sector Development;

- There is still no defined political will of any of the relevant political parties to begin with serious engagements to enable a real RES development. It is still a "marginal" problem which conditions concentration of funds but do not contribute for resolving "serious" and urgent needs of the country;
- Government is still not organized in the way to have full control on the process of reorganization and work of all the life sectors. Different ministries have different approach for resolving concrete problems and works sometimes in completely

different directions, or completely neglect their responsibilities. Absence of coordination is noticed in all the life and economy sectors;

- Very poor economy, pressed with urgent problems like a catastrophic unemployment, doesn't allow planning of any serious finance resources needed for realization of such actions.

The only way to overcome the constraints is to negotiate with EU and World Bank for financing initial activities and taking the responsibility for their implementation by direct collaboration with the government of the country. It is understandable, that it is possible only after the definition of targets to be reached.

### 2.3.1 Lobby Work to Decision makers

Lobby work is not an easy question when RES development is in question. Problematic needs concentration of efforts and funds for results (even attractive!) which should come much later, i.e. after many years engagements. That requires stabile political situation and defined strategies of development enabling identification of positive contributions of each one involved in implementation. Both are missing in FYR Macedonia, where political parties are under pressure of big stability and economy problems of the country in a hard process of transition.

In any case, no real results can be reached without lobbing between the present (and probably future?) decision makers and users.

When users are in question, situation is rather improved during the recent years. RES are under continual attention of the press and electronic information devices. Under the pressure of present process of continual increase of energy prices, negative impact of fossil fuels use, climate changes, etc., a very positive public opinion about introduction of RES is already reached. Improving of present positive situation can be expected during the coming years. Very positive impact is expected of the results of the modernization of the Kocani geothermal district heating system project of ADA and the RES Integration project in Strumica region of FP6 EU programme in Strumica.

When politicians are in question, main lobby points can be identified in the Ministry of Economy and Ministry of the Environment. According to the present situation, much better is the situation in the later one, as consequence of the one of previous ministers who fully understood the importance of the problematic and supported initialization of necessary actions. Problem in Ministry of Economy can be identified in the fact that it is not equipped with necessary organizational framework and personnel who can initiate or perform any serious action. If taking into account that it is the place where responsibility for composition of new legislative, concrete strategies preparation and implementation and realization of large national and international public projects is located, a concentrated lobby work is necessary.

First and very important step towards improving the situation is the increase of influence of NGOs in the process of concrete policy for development determination. Concrete national professional associations, as are ZEMAK (ass. of energy engineers), MAGA (geothermal ass.), MAIEB (ass. for biomass energy use development), SOLAR MACEDONIA (solar energy ass.), OPM (Consumers org. of FYR Macedonia), etc. are working hard on dissemination of information and "know-how" in the country but are generally ignored by the government.

Municipalities can be also a very good field for lobbing. As the examples with the Municipalities of Kocani and Strumica illustrate, good informed mayor can give very important positive "push" towards orientation of RES development. In opposite, the case of

the capital, i.e. Skopje, where the best economic possibilities are concentrated, doesn't exist any serious RES project due to the absence of interest of present mayor and the assembly

### 2.3.2 Possibilities for RES funding within the existing or planned Programs

There are enough possibilities for RES development funding from international sources but no one from the home sources.

Most important ones, when donations are in question, are EC countries and USA. All of them are related to public funding, i.e. for realization of direct development programs or projects, previously identified as priority of the country user and in line with defined politics of the donor one. Success depends very much on ability of the user to identify concrete programs and projects and to support successful implementation of grants. When RES are in question, as mentioned before, the collaboration with ADA is the best example what's possible when a good local expert's support is on disposal.

When the mix of donations and financing with very convenient credit conditions on larger scale is in question, most important partners are EBRD and IBRD of the World Bank. Both offer specialized program packages for development of RES. In the case of EBRD these are the packages for financing environment protection or improvement and projects with environmental composition. World Bank has a very large GEF program, by which RES in general and separate RES development can be financed. FYR Macedonia still didn't used funds from EBRD for RES development, however present process of organization of the Agency for RES and Energy Efficiency is financed by GEF fund with about 6 billion US$. Here, the most important part when development of RES is in question is financing of establishment of the first ESCO company with about 800.000 US$.

European structural funds are also a good possibility for funding RES development programs, however, up to now; they are used for different purposes.

When IRES schemes are in question, the RES Integration Project is the first one which shall demonstrate possibilities for financing organized regional approach to RES under acceptable conditions.

### 2.3.3 Forging alliances with strong partners like political parties, national utilities or NGOs

According to the experience of the last 15 years, FYR Macedonia has no experience in support of the development of RES by the use of alliances with political parties. However, the experience with the Austrian Development Agency (ADA) is very positive and prospective. Already 5 RES projects have been successfully supported and several new ones are planned for near future. Experiences with GTZ are also positive, however they are financing only very small projects, connected to development of more successful organization of infrastructure and development of SMS. Collaboration is initiated with the ICE from Italy, and also with similar institutions from Norway, Sweden, Swiss, etc. and good results in near future can be predicted. USAID is very much present and already funded preparation of one big and several small studies.

There are several bilateral contracts with the neighbouring and ex-Yugoslavian countries (Slovenia, Croatia, Bulgaria, Romania, Albania) for scientific collaboration but, up to now, the problematic of RES development still didn't got any priority in order to enable some practical advance. Obviously, such collaboration with strong foreign partners has been very useful for the country and that it can be significantly enriched if improving the quality of practical implementation of reached results of all the collaboration lines and concrete projects.

When NGOs are in question, there are numerous possibilities on disposal, however that is not possible until the place of NGOs in the political and governmental system of the country becomes clearer.

# 3 Road Map for RES/EE Implementation in Serbia

## 3.1 Country presentation

### 3.1.1 General information

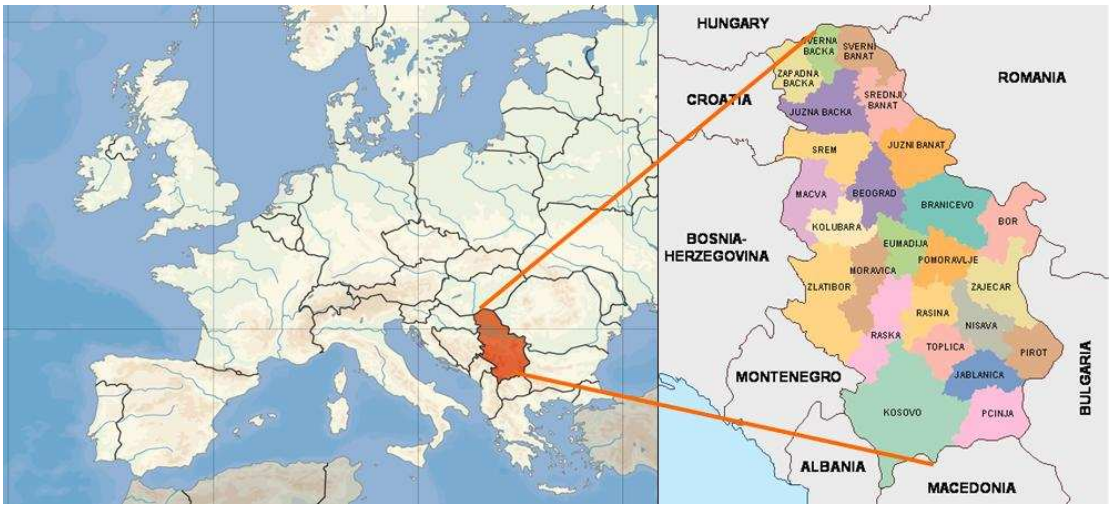


*Figure 2: Map of Serbia on the European Continent*

The Republic of Serbia is a landlocked country in Central and South-eastern Europe, covering the southern part of the Pannonia Plain and the central part of the Balkan Peninsula. It is bordered by Hungary on the north; Romania and Bulgaria on the east; Albania and the Republic of Macedonia on the south; and Montenegro, Croatia and Bosnia and Herzegovina on the west. The capital is Belgrade. The population of Serbia is 7.498.001 excluding Kosovo, according to the census from 2002.

### 3.1.2 Renewable Energy

#### a) Hydro Power Plants

The total capacity of nine hydro power plants with fifty hydro units amounts to 2,831 MW, which makes almost 34 percent of EPS's total electric power potential. Hydro power plants produced 11,021 GWh in 2004, which makes 31 percent of the total electric power production of the Electric Power Industry of Serbia

#### b) Geothermal Energy

The geothermal potential of Serbia is presented as follows:

- 100 locations with springs
- Temperature: usually 30-60 °C, rarely up to 80 °C, max. 110 °C
- Over than 50 locations have the potential > 1 MW

The priorities for exploitation of geothermal energy are for heating, revitalization (heat pumps), construction of new installations.

### c) Wind Energy

There are no operational wind turbines in Serbia. A countrywide wind-atlas is not available. Following inter alias the areas of Serbia where wind velocity exceeded 6-beau fort and the number of days this was the case. The locations with the highest velocities in 1999 and 2000 were the following:

- Crni Vrh: 256–223 days
- Ban. Karlovac: 128-155 days
- Vranje: 133-156 days
- Kopaonik: 134-144 days
- Nis: 81-105 days
- Beograd: 130-114 days

According to the investigations made by experts from Agricultural Faculty and Faculty of electronics from city of Beograd in 2003, potentials to produce electricity from wind in Serbia and Montenegro are as follows:

- Average speed of wind: 4 – 6 m/s,
- Potential (onshore) wind capacity: 11 000 MW,
- Potential (onshore + offshore) wind capacity: 15 000 MW,
- Electricity produced from (onshore + offshore) wind: 26,3 TWh/yr

### d) Small River Hydro-Power Plants

### e) Potential:

Cadastre of potential location;

900 locations for HPP up to 10MW;

Gross capacity approximately 500 MW.

### f) Situation:

Approximately 60 units have been constructed (50 % out of service);

Average 1 MW.

### g) Priorities:

Revitalization;

Small HPP on existing water-gates;

Construction of new HPP.

There are a few demonstration projects and feasibility studies carried out by Serbian Energy Efficiency Agency in collaboration with European Agency for Reconstruction and other donors, for the exploitation of the renewable energy resources of Serbia.

## 3.2 Analysis of Restructuring and Development Programs

In this section, all Restructuring and Development Programs which are in operation or under preparation in Serbia are analysed. Much of the information was found in the Serbian National Poverty Reduction Strategy Paper (PRSP). The description for each Program is based on the following criteria:

- Description of the program content;
- Objectives and strategies of the program;
- Energy related program tasks;
- Administrative description of the programs: Donor and funding organization;
- Operating body on international, national and regional level;
- Funding volumes;T
- Time frame of the program;
- Preparation procedure of the programs - how they came into force: The installation of the program operation, administration and monitoring;
- Involvement of civil society and development partners;
- The role of the different bodies like regional and national Governments, national Parliament, EU Council and Parliament and others;

The production from renewable energy sources is not yet under the regulative, so there is an absence of feed-in tariffs and similar mechanism and instruments that promote the favorable sources of energy.

However, the National Implementation Program of Strategy for the development of energy sector up to 2015 has been ratified by the Parliament at the beginning of 2007. The National Assembly of The Republic of Serbia has adopted the "Program for the implementation of Strategy for the Development of Energy Sector in Serbia for the Period to 2015".

The basis of the energy policy is incorporated in Serbian Energy Law and Energy Development Strategy up to 2015. Both documents can be downloaded from the Ministry of Mining and Energy web site. (recently, the National Assembly has adopted the program for implementation of said Strategy).

### 3.2.1 Existing Plans and Programs

The identified plans and programs in Serbia are the following:

**a) Contract for establishment of energy union between EU and countries of South-East Europe**

The contract was ratified on 14.July 2006 by Republic of Serbia. Then, Republic of Serbia accepted to apply EU directives (2001/77/EC and 2003/30/EC) that have the objective to increase use of renewable energy sources. The directive 2001/77/EC promotes a production of electrical energy from renewable energy sources in internal energy market. The directive 2003/30/EC promotes use of bio-fuel and other fuel from renewable energy sources in traffic.

Because of the contract, Republic of Serbia is obliged to make plan how to apply these directives up to the middle of 2007.

Directive 2001/77/EC defines renewable energy sources; ask to set national indicative goals for consumption of electrical energy produced from renewable energy sources and ask to define program of measures to reach the goals. These goals are revised every 5 years. When these goals are reached, EU members' countries are obliged to notify European Commission. In addition, they are obliged to guaranty the origin for electrical energy produced from renewable energy sources. The states are obliged to analyze and improve current legal and administrative procedures that are must for construction and operation of plants that produce electrical energy from renewable energy sources; to establish compulsion for operator of transport and distribution systems to take over and transport electrical energy from renewable energy sources with possibility to provide priority in access of main and dispatching through the main; and clearly to defined technical conditions and tariffs for appending to the main and conditions to rehabilitate electrical energy main.

The directive 2003/30/EC defines biofuels and ask states to put on the market some quantity of biofuel (2% of total quantity of fuel used in traffic up to the end of 2005., or 5,75% up to end of 2012), to promote their use, to inform European Commission each year on measures used for promotion of use of bio-fuel in transport, on production energy from biomass in other purposes, and on total accomplished turnover on the market with percentage part of use of bio-fuel (as mixed or non-mixed).

### b) Energy law of Republic of Serbia

This law defines energy policy that introduces measures to make conditions to stimulate use of renewable energy sources. To do this, the law introduces the category of privileged producer of electrical, and heat energy that in the process of energy production uses renewable energy sources. These producers have a right for subventions, tax, custom and other easements, according to law and other documents that responsibilities that regulate taxes, custom duties and other tolls, subventions, and other measures of stimulation..

This law does not recognize separately categories of bio-fuel used as fuel in traffic and does not make needed basis for their use, and for application of directive 2003/30/EC. In addition, there are no clear definition of obligation of operator of transmission system, i.e., distribution companies to have priority to plug in producers of renewable energy sources to energy network, to give to this energy priority in dispatching and to make transparent conditions and tariff systems for plug in to energy network, that is one of obligations regarding directive 2001/77/EC and suggestion of practice of countries that are successful in promotion of use of renewable energy sources, as well as obligation to producers of electrical energy to co-combust biomass when it is possible.

### c) National program of environmental protection

To protect nature, the national program recognizes the great significance of fossil fuel substitution and non-renewable energy sources with renewable energy sources, as well as necessity of larger use of renewable energy sources with objective to decrease negative influence of energy industry to environment. To enlarge use of renewable energy sources, the program ask for selection and introduction of some instruments for stimulating of renewable energy sources, as: tax, custom duties and other easements, subventions during construction of plants for use of renewable energy sources, introduction of privileged tariffs for energy manufacturers etc., as well as application of instruments of Kyoto protocol.

### d) Strategy of energy industry development of Republic of Serbia up to 2015

This document was adopted by People assembly of Republic of Serbia in May 2005 (Anonymous, 2005). The strategy gave the basic priorities of development of energy industry in Serbia which are the following. Technology modernization of energy sources / plants, rational use of quality fuel, use of renewable energy sources and new energy technologies, construction of new energy sources/ plants.

### e) Program of realization of Strategy for energy industry development of Republic of Serbia up to 2015 for period from 2007 to 2012

The program gives conditions, method and dynamics how to realize the Strategy of development of different sectors of energy industry in Republic of Serbia. The sectors to be developed are coal mining, transport of crude oil, and industry of crude oil, gas, electro-energy, and heat. Heat industry regards to heat plants in city and individual boilers. In addition, use of energy in industry would be developed as well as energy efficiency in industry, traffic, and buildings, renewable energy sources, and environmental protection in energy industry. The developed electro-energy industry would consist of development hydro-power plants, heat power plants, combined heat power plants-heat plants, and transport and distribution of electrical energy. In addition, the program urged for establishment of Fund for energy efficiency. In conclusion, one of priorities of the strategy is selective use of new and renewable energy sources with objective to slow increase of fuel import, to decrease of negative influence of energy industry to decrease of negative influence of energy production to environment and to open additional activity for domestic industry and to employ local inhabitants, to adapt to practice and regulative of EU in this field. It is expected that when this program is realized, Republic of Serbia would approach to the international standards in the field of energy industry.

Energy policy (run by Ministry of mining end energy industry) targets to increase safe, qualitative, and reliable supply of energy and fuel, secure development of energy infrastructure and implement up-to-date technologies, secure conditions for improvement of energy efficiency, establish conditions to stimulate use of renewable energy, and enhance environmental protection.

## 3.2.2 Key Governmental actors at level of Republic of Serbia

The government is relevant for definition and implementation of development programs on regional, national and European level. The government proposes new laws and supporting documents to the Parliament, also the budget composition with participation of costs for realization of concrete actions. Government accepts or refuses initiatives of different ministries, international organizations, etc., and signs bilateral contracts for realization of internationally funded projects. The government has several agencies and offices:

(1) Agency for insurance of deposit, recovery, bankruptcy, and liquidation of banks,

(2) Office for accession to European Union,

(3) Agency for development of small and middle companies,

(4) Agency for recycling,

(5) Agency for foreign investment and promotion of export.

On the state level currently our country is governed by coalition of parties: the Democratic Party(DS), Sanjak Democratic Party, the Democratic Party of Serbia (DSS), New Serbia(NS), and G17 Plus (G17+).

The government of Serbia consists of ministers that are affiliated to four parties: the Democratic Party (DS), the coalition of the Democratic Party of Serbia (DSS) and New Serbia(NS), and G17 Plus (G17+). The affiliation of ministers is in Table 1.

*Table 3: Position of different staff in Serbian government with their portfolio, party and importance to RES development.*

| Position | Portfolio | Name | Party | RES important |
|---|---|---|---|---|
| Prime Minister | General Affairs | Vojislav Koštunica | DSS | Yes |
| Deputy Prime Minister | European Integrations | Božidar Đelić | DS | Yes |
| Secretary-General | | Dejan Mihajlov | DSS | - |
| Minister | Finance | Mirko Cvetković | DS | Yes |
| Minister | Agriculture, Forestry and Water Management | Slobodan Milosavljević | DS | Yes |
| Minister | Defence | Dragan Šutanovac | DS | - |
| Minister | Justice | Dušan Petrović | DS | - |
| Minister | Foreign Affairs | Vuk Jeremić | DS | - |
| Minister | Labour and Social Policy | Rasim Ljajić | SDP | Yes |
| Minister | Public Administration and Local Self-Government | Milan Marković | DS | Yes |
| Minister | Environmental Protection | Saša Dragin | DS | Yes Yes |
| Minister | Telecommunications and Information Society | Aleksandra Smiljanić | DS | - |
| Minister | Diaspora | Milica Čubrilo | DS | - |
| Minister | Culture | Vojislav Brajović | DS | - |
| Minister without Portfolio | National Investment Plan | Dragan Đilas | DS | Yes Yes |

| | | | | |
|---|---|---|---|---|
| Minister | Interior | Dragan Jočić | DSS | - |
| Minister | Energy and Mining | Aleksandar Popović | DSS | Yes Yes |
| Minister | Infrastructure | Velimir Ilić | NS | - |
| Minister | Kosovo-Metohija | Slobodan Samardžić | DSS | - |
| Minister | Education | Zoran Lončar | DSS | Yes Yes |
| Minister | Trade and Services | Predrag Bubalo | DSS | - |
| Minister | Religion | Radomir Naumov | DSS | - |
| Minister | Economy and Regional Development | Mlađan Dinkić | G17+ | Yes Yes |
| Minister | Science | Ana Pešikan | G17+ | Yes Yes |
| Minister | Health | Tomica Milosavljević | G17+ | Yes |
| Minister | Youth and Sports | Snežana Samardžić-Marković | G17+ | - |

Key actors, relevant for the RES development programs in Serbia are as follows:

**a) Ministry of Mining and Energy of the Republic of Serbia**

This ministry is responsible to fulfil all the tasks connected to the work of energy sector in the country. It is relevant for definition and implementation of priorities in all economy sectors, of energy development programs, prepares proposals for new laws, strategies, programs, etc. to the government. It also directly participates in negotiations with foreign donors and is responsible for their implementation. This ministry has two agencies: (1) Agency for energy and agency for energy efficiency:

(1) Agency for energy of Ministry of Mining and Energy of the Republic of Serbia

The agency for energy is founded by Energy Law ("Службени Гласник РС", број 84/04 од 24. July 2004.). The agency has rights, obligations, and responsibilities determined by laws and other regulations. The agency is founded as the regulatory body for doing jobs on improvement and directing of development of energy market on the principles of no n-discrimination and efficient competition, monitoring of application of regulations and rules for operation of energy systems, adjustment of activities of energy subjects in order to provide energy to consumer in timely manner and service and their protection and concurrent position.

(2) Agency for Energy Efficiency of Ministry of Mining and Energy of the Republic of Serbia

Energy Efficiency Agency is formed as special republic organization meaning separate legal entity. The managing of the agency is carried out by director who is appointed by the Government of the Republic of Serbia. Internal organization and job description in the Agency is approved by the Government of the Republic of Serbia. The Agency responds for the operation to the Government of the Republic of Serbia. The Agency submits annual programme and report on the operation to the Government of the Republic of Serbia. The Agency is direct user of the republic's budget and EU donations (provided through European Agency for Reconstruction, EAR) for financing of its programmes and projects.

Energy Efficiency Agency would carry out activities related to proposing incentive measures aimed at enhancing energy efficiency; programmes and measures for stimulating rational and efficient energy use; and monitoring their implementation; activities for implementing energy efficiency, renewable energy sources exploitation and environmental protection; technical and other regulations for increasing energy efficiency; criteria for equipment efficiency evaluation in use of energy and method of marking them in line with adequate international regulations and standards; financial and technical support in the preparation and implementation of priority energy efficiency projects; consultative, advisory and educational activities in promoting energy efficiency.

**b) Ministry of Economy and regional development of the Republic of Serbia**

This ministry is responsible to fulfil all financial tasks connected to the operation of energy sector in the country. It is relevant for definition and implementation of priorities in all economy sectors, of energy development programs, prepares proposals for new laws, strategies, programs, etc. to the government. It also directly participates to negotiations with foreign donors and is responsible for their implementation.

**c) Ministry of Finances of the Republic of Serbia**

It is only a department of it, responsible to fulfil all the tasks connected to the work of finance sector in the country. It is relevant for definition and implementation of priorities in the sector, prepares proposals for new laws, strategies, programs, etc. to the government. Also it participates to direct negotiations with foreign donors and is responsible for their implementation.

**d) Ministry of Education of the Republic of Serbia**

This ministry is relevant for definition of state priorities in the field of education. It directly influences implementation of foreign support for proposed education projects, to be financed by foreign donors or in bilateral collaboration.

**e) Ministry of Science of the Republic of Serbia**

This ministry is relevant for definition of state priorities in the field of science. It directly influences implementation of foreign support of proposed scientific and education projects, to be financed by foreign donors or in bilateral collaboration.

**f) Ministry of Environmental Protection of the Republic of Serbia**

This ministry is relevant for definition of state priorities in the field of environmental protection. It directly influences implementation of foreign support of proposed projects of environmental protection, to be financed by foreign donors or in bilateral collaboration.

**g) Ministry of Agriculture, Forestry, and Waterworks of the Republic of Serbia**

This ministry is relevant for definition of state priorities in the field of agriculture, forestry, and waterworks in Serbia. It directly influences implementation of foreign support for proposed projects in agriculture, forestry and waterworks, to be financed by foreign donors or in bilateral collaboration.

**h) Minister without portfolio for National investment plan.**

The position is currently occupied by Dragan Djilas. This minister is relevant for definition of state priorities in the field of the national investment plan in Serbia. It directly influences implementation of foreign support for the national investment plan, to be financed by internal funds, foreign donors or in bilateral collaboration.

**i) Institute for protection of nature of Serbia,**

Institute for protection of nature in Serbia is unique expert organization that does activity of protection and facilitation of nature of Serbia. Institute does it by the following means: starting of protection procedure, research and investigation of biodiversity and geo-diversity, expert monitoring, international cooperation, publishing, education, presentation and communication, museum activity, development of data base, participating in making space plans, giving conditions for space-planning documents, and giving opinion about influence to environment related to urban planning, forest, waterworks, fishing basis and other investment-technical documentation. Field of environmental protection is regulated by norms directly, with several lows and bylaws: bylaws on protection of general reserves, special reserves of nature, parks of nature, regions with special characteristics, monuments of nature, as order on prohibition of collection of some protected spices on defined regions of Serbia, etc. As protection of environment and nature is field where large number of regulations still is not harmonized with regulations of European Union, the process of their harmonization is currently under way. Law of environmental protection is brought on December 2004 together with three important laws: Law about integrated control and prevention of pollution, Law about evaluation of influence to environment, and Law about strategic influence evaluation.

**j) Permanent conference of cities and municipalities**

http://www.ekoserb.sr.gov.yu/ linkovi/view.php? cid=23 Relevant for definition and implementation of regional and local development programs and projects. Participate financially in realization of projects.

**k) Commerce chamber of Serbia http://pks.komora.net/**

Commerce chamber of Serbia is independent, non-government, business-expert and interest association of legal and personal subjects that do registered business. Commerce chamber members are companies from all business fields and branches, in all types of properties, banks, and other financial organizations, insurance organizations, agricultural cooperatives – as collective members in this chamber, craft and other stores – as collective members via their societies. Function of chamber is to represent joint interest of companies and other commerce subjects before state organs and organizations, in creating commerce system, measures of economic policy, and conditions of commerce and business, in harmonizing interest and activities of companies, confirming joint opinions, exchanging experiences, making joint business connections, and giving information, expert help, and consulting services to their members.

(1) Information about Serbia commerce on market, companies, production, export-import and other business information,

(2) Information on markets of separate countries: groups, regions, possibilities of export, conditions of business.

(3) Questions on law regulations of commerce,

(4) Ideas about investment intentions, selection of programs and pripremi in advance investment analyses,

(5)Preparation of pre-structuring (owners, matters of organization, control, and programming).

(6) Introduction of quality system,

(7) Protection of inventions and technical advancement in objective production and marketing.

(8) Harmonization of development - participant to create and realize strategy of development, politics of regional development, infrastructure and new projects;

(9) Nursing of good business customs – straitening of business moral in commerce, and honor courts;

(10) Public authorization for giving certificates, agreements, and permits in doing business with foreign countries, solvency of companies, administering of register, etc.

(11) Informing public – informing commerce and public about operation of chamber and its organs, informing inside chamber system, cooperation with means of public informing, publishing herald of Commerce chamber of Serbia "Week information "....

#### l) Department for European Integration

http://www.mfin.sr.gov.yu/html/modulesphp?op=modload&name=Subjects&file=index&req=viewpage&pageid=1068

The department does normative and analytical-study jobs related to monitoring of regulations of European laws, analyses of harmonization of legal system with standards of European legal system, preparation of suggestion for enhancement of regulations in this field, preparation of information and material for need of involvement of representatives of Ministry in inter-field and other working groups related to harmonization of economy and legal system of country with European Union, expert work and statistical following projects of help of European Union to Ministry and other documentation jobs in area of European integration.

### 3.2.3 Key Governmental actors at local level

#### a) Political parties at region of Kragujevac and Knic

On the local level of Kragujevac municipality, there is the following distribution of political power. Political parties that are involved in Kragujevac assembly are “Together for Kragujevac”, Democratic party, Serbian radical party, Socialistic party of Serbia, Democratic party of Serbia, Movement of Serbian power, “For our city” and New Serbia. The parties with higher number of seets are mentioned first. he coalition of “Together for Kragujevac” gave the mayor of Kragujevac, Veroljub Stefanović. (CESID, 2007a). Together for Kragujevac is coalition of Serbian Renewal Movement, Serbian Democratic Renewal Movement, and Social Democratic Party.

On the local level of Knic municipality, there is the following distribution of power. The major political parties that are in power of Knic assembly are the following: coalition of Serbian renewal movement and New Serbia, Democratic Party of Serbia, Citizen Group "To continue", Democratic Party, Socialist party of Serbia (CESID, 2007a). The mayor is Nikolić Bratislav that is a member of Serbian renewal movement (SPO).

**b) Local governmental level of region of Kragujevac and Knic**

Offices for local economy development of Kragujevac municipality are the following:

Regional commerce chamber Kragujevac, Regional agency for small and middle companies "Sumadija",

Office for local economic development. Contact data on these offices are the following.

Regional commerce chamber Kragujevac (Regionalna privredna komora Kragujevac) Address: Dr. Zorana Đinđića 10/IV; Contact person: Dušan Puača; Telephone number: 034/335-805; Fax number: 034/335-010 Email: komora@rtk.kg.co.yu

Regional agency for small and middle companies "Sumadija" ( Regionalna agencija za mala i srednja preduzeća `Šumadija`) Address: Kragujevačkog oktobra 98

Contact person: Jasminka Jagličić; Telephone number: 034/331-971; Fax number: 034/336-118; Email: smerakg@eunet.yu

Office for local economic development ( in the frame of city administration for industrial resources – Department for industry and economic development) (Kancelarija za lokalni ekonomski razvoj u okviru Gradske uprave za i resurse – Odeljenja za privredu i ekonomski razvoj) Address: Trg slobode 3; Contact person: Nataša Pešić Radosavljević; Telephone: 034/34 306 189; Fax: 034/306 187

Email: npesic@kg.org.yu. The basic functions of these offices are the following: 1. Establishing contact with potential investors, 2. Coordination of strategic and operative planning, 3. Support and expansion of existing business, 4. Foundation of new business (Brownfield and Greenfield), 5. Research, 6. Marketing/ business information, 7. Improvement of business ambient, and 8. Strategic planning for Kragujevac municipality.

### 3.2.4 Key actors - national utilities

In the republic of Serbia, the national utilities are the following: EPS, NIS, etc.

**a) Electric power industry of Serbia –EPS (www.eps.co.yu)**

Public enterprise "Electric power industry of Serbia" was established by Decision of the Government of Serbia which entered into force on 1 July 2005.

Its basic task was meeting all the electric power requirements of the economy and inhabitants of the Republic of Serbia. The enterprise was vertically organised comprising 11 Economic associations (as of June 1999, the Enterprise cannot manage their facilities at Kosmet). The enterprise activities were electric power generation, electric power distribution, distribution system management, electric power trade, coal production, processing and transport, steam and hot water production in combined heating processes, water power utilisation and services in river and lake traffic, wholesale trade in fuel and similar products, research and development; design, construction and maintenance of energy and mining plants; design, construction and operation of telecommunication facilities; and engineering.

Enterprise is owned 100% by the Republic of Serbia. Enterprise is managed by Board of Management, Supervisory Board, Director General – all appointed by the Government of the Republic of Serbia. Directors of Departments and Divisions within the EPS Head Office, together with the Directors of Economic Associations, form the Management of the Electric Power Industry of Serbia.

The role of renewable energy sources in Electric power industry of Serbia (Electric power industry of Serbia, 2007b) is of broad public interest. Namely, EPS would in future invest in some of RES: micro hydro power plants at the locations already owned by EPS. Investments in other RES are of lower priority.

**b) Oil Industry of Serbia in Novi Sad**

http://www.nis.yu/ is Shareholder Company for exploration, production, and distribution and commerce of crude oil, oil derivates, and for exploration and production of natural gas. The company is founded by the decision of Government of Republic of Serbia on 1.October 2005. The company currently employs around 13 000 workers. The company consists of three departments:

1. Department for explorations and production of crude oil, natural gas, underground water, and geothermal energy (NIS Naftagas Novi Sad);

2. Branch for processing of crude oil, production of oil derivatives and industrial and motor oil, trading of crude oil and oil derivatives, import and export (NIS-Petrol Beograd);

3. Branch for trading of liquefied petrol gas (NIS-TNG Elemir)

Headquarters of the company are in Novi Sad, however its divisions are in entire Serbia.

Activities in the branch for "Investigation and production of crude oil, gas and geothermal energy, in future would be in maintenance of production level at the state and in increase of crude oil production for domestic needs from abroad. In addition, intensive use of geothermal energy from existing sources is planned, as well as research of new geothermal sources according to needs. For this planned development of investigation and production of crude oil, gas, and geothermal water, it is estimated that it is needed around 50 million $ per year.

In the branch of "refinery processing", there is the capacity for processing of crude oil of 5 to 7 million of tonne per year. This can satisfy needs of customers for future 5 years. Oil industry of Serbia has the highest number of petrol stations in Serbia.

Oil industry of Serbia would diversify its activities that should include use of RES, expecially geothermal energy and producing drinking water that is known as oil of 21 century.

**c) NIS- Energogas (http://www.energogas.co.yu/)**

The main activities of NIS- Energogas are: transportation and distribution of natural gas and liquid petrol gas (LPG) as well as engineering in gas industry. The work process is organized in several specialized areas: transportation and distribution of natural gas, transportation and distribution of LPG, engineering for gas installations, maintenance of the pipeline system, development, commercial activities (including purchasing and supply of LPG and gas appliances) automatic data processing, remote control of the gas pipeline system. Its e-mail is energogas@ energogas.co.yu.

### 3.2.5 Key non-governmental actors at level of Republic of Serbia

There are a list of NGO, trying to find a useful place in the preparation of strategies, definition of development plans and programs, connected to RES and Energy Efficiency. However,

government still doesn't accept them as a relevant participant in the process of preparation and implementation of development plans and programs.

**a) Ecology society for local sustainable development**

"EKO-LOR" (Ekološko udruženje za lokalno održivi razvoj "EKO-LOR"), The society contributes to healthy environment and sustainable development in the local level by partnership with international and other local organizations. http://ekolor.wetpaint.com/?t=anon

**b) Environmental Ambassadors,**

Environmental Ambassadors is a non-profit, NGO, based in Belgrade. As member of CONGO (conference of international NGO), it is only organization in the region with advising status in United nations, with accreditation of UNEP, European bank for renewal and development (EBRD) for questions of sustainable development and environment. The regions of work are sustainable development and environment, ecology diplomacy and security, making campaigns for public representation and lobbing, strengthening of capacity of human resources in government institutions, public, business, and NGO sector, developing of communication skills and strategies. http://www.ambassadors-env.org/eng/index.php

**c) Regional centre for Environment for Central and East Europe (http://www.recyu.org/)**

The centre transfer and disseminate the knowledge in environmental field, sustainable development and communication on all levels throughout Central and East Europe. The centre organizes different types of meetings, workshops, and assemblies in environmental field.

**d) Serbian Green Youth (http://www.zelenaomladina.org/)**

This NGO contributes better information system and raises public awareness in environmental field in Serbia young population.

**e) Yugoslavian nongovernmental environmental network (YUNEM)´**

YUNEM is a non-governmental environmental network that has the task to gather together and enable mutual cooperation of environmental NGOs in Yugoslavia. There is significant number of NGOs in FRY that are dealing with environmental matters, in all aspects, and they are representing potentially considerable stakeholder of contemporary, democratic development, in respect with the existing global standards of the environmental protection and care, in the widest sense http://www.come.to/the.green.table

**f) Local NGO level of region of Kragujevac and Knic**

Ecology research society "Mladen Karaman"-local NGO (Еколошко истраживачко друштво "Младен Караман"). The society is established at Science faculty in Kragujevac on 1996. Mission of society is to teach and to qualify young people for ecology research and waking of ecological awareness. http://www.eidmk.co.yu/

## 3.3 Formulation of Strategy Options for RES/EE Implementation

Strategy options are formulated in the document titled "Program of realization of Strategy for energy industry development of Republic of Serbia up to 2015 for period from 2007 to 2012 referring to Renewable Energy Sources". In this document, measures/activities that are vital

to overcome the identified barriers for use of renewable energy sources are classified in several groups according to the following objectives:

- Objective 1 – Creating stimulating regulating framework for greater use of RES,
- Objective 2 – Providing and executing of financial measures for stimulation of RES use,
- Objective 3 – Introduction, providing and executing non-financial measures and activities for stimulation of RES use.

Detailed content and description of measures/ activities in the framework of each objective is given as the following.

### 3.3.1 Objective 1 – Creating stimulating regulating framework for greater use of RES

First, the framework for greater use of RES should be regulated, created and stimulated through (1.1) modifications and additions in currently valid laws, and (1.2) provision of new laws and bylaws.

(1.1) Modifications and additions of currently valid laws would be done through the following activities:

(1.1.1) Harmonization of strategy documents of VRS. It will be done harmonization of laws and sector strategic documents, and harmonization with space, urban and other plans of use of locations with RES potentials.

(1.1.2) Harmonization of domestic regulations related to RES with that of EU. It will be done through creation and execution of plans for application of directives 2001/77/EC and 2003/30/EC. Policy and regulations/rules of EU in field of RES will be permanently followed. The activities would be undertaken with objective of harmonization of domestic regulations related to RES with EU regulation including organization and coordination of work of working groups in this field.

(1.1.3) Modifications and additions in Energy law. Modifications and additions of the law will be done clearly to specify provisions related to RES and especially, organization of its use. It would be necessary to do the following: examine possibility to establish Fund for energy efficiency in order to stimulate national program of energy efficiency and production of energy from RES (Fund can be established through other laws, for instance Law of rational use of energy etc.); insert necessary clarification related to so called privileged producers of electrical and heat energy, with objective to establish conditions for implementation of Program in RES field together with definition of necessary accompanying sub-law regulations and rule book in this field; clearly define obligations of VRS and MRE to provide financial stimulation mechanisms and other easements with objective to enhance use of RES; introduce notion of bio-fuel that is used as fuel in traffic; define conditions to obtain status of privileged producer of heat that has to be provided to MRE with objective of unified approach and management of politics in this field; define clearly duty of actors on energy market with respect to attachment to the network, take over, and dispatch of electricity/heat etc.; make the law basis to apply directives 2001/77/EC и 2003/30//EC.

(1.1.4) Modifications and additions in Law for planning and construction. It is recommended toinvestigate possibility that one of methods to plan and arrange space and development priorities will be to provide rational use of non-renewable nature resources and larger use of RES; then, put general and special conditions connected to improvement energy efficiency and use of RES in rules for arrangement of space and rules for construction; decrease fees for

arrangement and use of construction land paid by investor if on the construction land he builds the object that during its life will use energy from RES, etc.

(1.1.5) Modifications and additions in Law for forests. It is recommended to investigate possibility that ЈП „Србијашуме" can earn и obtain money for doing activities and development based on the delivery of energy produced by use of RES, and lease of land good for use of RES; then, to oblige users and owners of forests to collect, or organize collections of forest refuse and degraded forest wood and use it for energy or enable this use to interested sides; to grub up forests for building of objects for use of RES.

(1.1.6) Modifications and additions in Law of agricultural land. It is recommended to analyze possibility to make conditions for use of arable lend for non-agriculture purposes, i.e., to build objects for use of RES on this lend, as a possibility to exempt this land from fee on agricultural land.

(1.1.7) Modifications and additions in Law of local self-government. It is recommended to analyze the possibility to include an obligation to bring plans and programs of use of RES in the basic domain of work of municipality; then to secure making of these programs at its territory; for plants that use RES to analyze decrease/exempt from fees at local level.

(1.1.8) Modifications and additions in Law for waters. It is recommended to analyze possibility that a public hydro company can be also use of hydro-energy in the existing hydro-accumulations and waterways, and produce and sell electrical energy produced at these objects; to construct legally, reconstruct, and maintain micro, mini, and small hydro-plants; to give an adequate discount when deciding for compensation for use of multi-dedicated hydro objects by using micro, mini and small hydro-power plant for production of electrical energy.

(1.1.9) Modifications and additions in Law about transport and road traffic. It is recommended to investigate possibility to stimulate use of bio-fuel in road traffic so that from 2010, a public transport of passengers can be done by transport companies that spend liquid and gas bio-fuel in total consumption of crude oil derivate in previous year above some established percentage.

(1.2) Provision of new laws and bylaws is anticipated through the following activities:

(1.2.1) Bylaw about privileged producers of electrical and heat energy and bio-fuels. According to the Energy Law, it is necessary, first of all, to prescribe the conditions to obtain the status of the privileged producer of energy and to prescribe the criteria for the fulfillment of these conditions (method and procedure to obtain the privileged status). It is also necessary to examine a possibility, based on the modifications of Energy law, to determine specific financial stimulations for use of RES (for instance, to impose the height of privileged tariffs through this bylaw or separate bylaw).

(1.2.2) Rule-book about production, examination and commerce of plants, equipment and devices for use of RES. This rule-book should prescribe the standards that should use designers, producers, investors and users through production, commerce, construction, and examination of RES objects. The rule book should also prescribe ecological and other rules that should fulfill built RES projects.

(1.2.3) Rule-book about tariff system and conditions of connecting of the privileged producers of heat energy to the system for distribution of heat energy. This rule-book should, according to law, to be done by proper agency of local self-government to define: register of privileged producers of heat energy; register of technical and other conditions, and register of costs of connection of objects that use RES for production of heat energy to communal (public) systems for distribution of heat energy, with tariff system for connection and use of the

distribution system. This last register should contain the tariff system and guaranteed (buy) prices of heat energy produced from RES and communal refuse (by using system of fixed prices).

(1.2.4) Further investigation and obtaining other necessary law regulations. To make good investment climate and to eliminate obstacles for grater use of RES, it is furthermore necessary to investigate existing and non-existing regulations of EU by their constant monitoring.

(1.2.5) Innovation of existing and setting new JUS standards related to design, construction, and use of RES objects. It is necessary to analyze in details current domestic standards and standards of EU related to design, construction and use of RES and make necessary activities for their harmonization.

### 3.3.2 Objective 2. – Introducing and implementation of financial measures and activities for stimulation of RES use

(2.1) Selection of system of stimulation mechanisms and their introduction to relevant law / bylaw regulative.

Electrical energy: After finishing study about stimulating mechanisms for electrical energy, financed by World bank, and its eventual revision, it is necessary that VRS make final decision about the application of appropriate stimulation system –mechanism that will be applied through appropriate laws/bylaws.

Heat energy: We should analyze needed stimulation for heat energy and how to enable subventions for investment through Fund for energy efficiency and subventions from budget of local self-governments. Also, we should establish other privileges: fiscal, custom, etc., and make law framework for application of the selected stimulations.

Bio-fuel in traffic: We should evaluate vital levels of stimulation of the production of bio-fuel for its use in traffic and suggest adequate mechanisms of financing. We should analyze separately stimulation through direct subventions of price per liter of bio-fuel and different easements.

(2.2) Establishment of Fund for energy efficiency

Expect for promotions of energy efficiency, Fund has to have the aim to stimulate use of RES. Fund would support subventions for realization of demonstration projects in the field of RES, as well as subventions for local self-governments to use RES; subventions to finance studies of feasibility (that can cover costs of the study partially or in full depending on the type of project and criteria of Fund). The fund would secure beneficial credits for investors in plants that produce energy from RES, and specially heat energy according to criteria that would be defined in the program framework of functioning of Fund. The fund would support subventions for research in technology development, development of concrete products, and transfer of knowledge and technology. the fund would support activities to increase awareness about the advantages to use RES and education done by AEE and other relevant institutions. The fund would help for subventions for equipment, for accreditation of laboratories and for making conditions for their applications and conduction of their control.

(2.3) Establishment of financial easements and other stimulations for stimulation of development of domestic production and equipment for use of RES, and stimulation of domestic companies and local self-governments for investment in use of RES

There may be possibility that Guaranty Fund of Republic of Serbia gives guaranties on credit for RES. There may be possibility of support of other existing Funds, and possibilities of other subventions and easements.

(2.4) Analyses and change of existing laws with objective to introduce subventions, fiscal, custom, and other easement and other measures for stimulation for use of RES

Through Law about Concessions, there may be possible to allow discount on concession cost for concession construction of new, or reconstruction or adaptation of existing objects for use of RES.

Through Law about Value Added Tax, there may be possible to introduce of lower rate of VAT for taxation of electrical and heat energy and bio-fuel obtained by use of RES, as well as equipment and material used in a construction of object/ plants for use of RES.

Through Law about Guaranty Fund, there may be possible to make the following obligations of the Guaranty Fund. For each budget year, the fund would predict the percent of its capital for guaranties and super-guaranties for credits that banks and other financial organizations in Republic of Serbia would give to companies for realization of RES projects. There may be possible that some finances of Fund for Energy efficiency are transferred to the Guaranty Fund for above mentioned purpose.

Through Custom law, there may be possible to free from payment of import taxes for equipment that is not produced in the country, but serves directly for use of RES or for production of bio-fuel.

Through Law about taxes on income of citizens, there may be possible to exempt/decrease tax rate on income from agriculture and forestry on the land with erected objects for RES use. In addition, the rated expenses would be accepted during establishing taxed income from the real estate leased for RES use.

Through Law about Excise, there may be possible to apply decreased excise rate on pure bio-fuel and on mixtures of bio-fuels with derivates of crude oil.

Analyses in the same sense can be done for other laws especially about possibility to have tax credits to support separate activities for promotion of RES.

(2.5) Set-up of program for long-range credits under convenient conditions for organization and facilitation of production and construction of objects for use of RES

There may be possible to attract commercial banks to credit projects in RES with support of international financial institutions and with support of activities of Fund for energy efficiency. Cooperation with international financial institutions should be established with objective to obtain support to credit project in RES.

(2.6) Ratification of Kyoto protocol

Ratification is necessary because it enables application of mechanism of pure development (CDM) for financing projects in RES.

### 3.3.3 Objective 3. – Introduction and implementation non-financial measures and activities to support use of RES

3.1 Organizational and institutional activities

(3.1.1) Establishment of inter-field body for coordination of activities with objective to increase use of RES and execute program of RES and establishment of expert working groups when necessary.

Regarding necessity of coordination of activities between different sectors for the objective of greater efficiency of program implementation in part of RES and securing of active involvement of all relevant Ministries in realization of programs in RES, it is necessary that MRE forms inter-field coordinating body (MKT).

(3.1.2) Defining administrative procedures to obtain necessary permits for construction and use of plants that use RES

With an objective to create beneficial climate for investing, these procedures should be transparent and publicly available to investors, local self-government and other institutions. When these procedures are identified, we should start with analyses of law regulative with objective to try its simplification and to remove law and administrative barriers.

(3.1.3) Determining real potential of wind energy

Evaluation of wind potential is based on many-year data from existing hydro-meteorological stations for measurements that are made on the height of 10m. However, for useful data, it is necessary to do one-year measurement on heights of 30 and 50m on great number of locations. Because of this, it is necessary to do measurements on the selected locations that will enable (with application of mathematical models) to have real picture of this potential. These analyses would enable the identification of regions that are beneficial for setting wind power plants, after which the investors can make measurements for concrete, selected locations with objective to investigate their economy.

(3.1.4)Forming base of data and registry of RES

It is necessary to establish the base of data of interest to RES and adequate registers for MHE, biomass, solar energy, geothermal energy, and wind energy, with objective to include locations with real achievable projects from Registry to space plans of local communities. Internet site and portal will be produced and maintained.

(3.1.5) Forming and accreditation of network of certificate laboratories for equipment in RES field

According to the established procedure of accreditation, Institution for accreditation will give adequate accreditation documents to the certificate laboratories for energy use of RES.

(3.1.6) Enhancement of work of cluster of manufacturer in RES field

Commerce chamber of Serbia will make conditions to enhance operation of current clusters of manufacturers of equipment in RES.

(3.1.7) Defining type of licenses and method to obtain them for persons that design, construct and use RES.

Engineering chamber in cooperation with MRE and AEE would define types of licenses, method of their attainment and time of re-licensing for persons that design and construct objects that use energy of RES. Central state body for coordination and Engineering chamber would define and make programs of education to obtain licenses for design and work with objects for use of RES.

(3.2) Expansion of awareness, promotion of good practice and education

(3.2.1 ) Constant promotion of RES and education in schools, local self-governments and companies

It would be useful to start informative-education campaign about need to use RES and about benefits that are obtained with their use, above all, regarding environmental protection.

Among others, we should promote good practice and results of studies of feasibility by using WEB site and other relevant methods in objective to increase interest of domestic investors.

Through education system, we should prepare staff for application and other development of new technologies and devices for use of RES.

(3.2.2) Making of studies of validity

These studies should show economy and usefulness of RES projects. Fund for energy efficiency would give subventions for making of these studies, and finances can be obtained also from donations.

(3.2.3) Realization of pilot projects

Financing of this activity would be provided from Fund for energy efficiency, international agencies and Funds, World Bank, Ministry of science and Ministry of environmental protection and similar.

(3.2.4) Creation experts in RES field

To create experts in use RES, and provoke construction of capacities of advising/designing and construction companies, study groups at universities would be fostered through the research-development projects of Ministries of Science and Ministry of environmental protection in the field of energy efficiency and RES, as parts of national program

# 4 Road Map for RES/EE Implementation in Albania

## 4.1 Country presentation

Albania, officially the Republic of Albania is a country in Southeastern Europe. It borders Greece to the south, Montenegro to the north, Serbia to the northeast and the Republic of FYROM to the east. It has a coast on the Adriatic Sea to the west and a coast on the Ionian Sea to the southwest. Albania is a potential candidate for membership in the European Union and NATO. The capital is Tirana. The population is 3.581.655 according to census in July 2006.

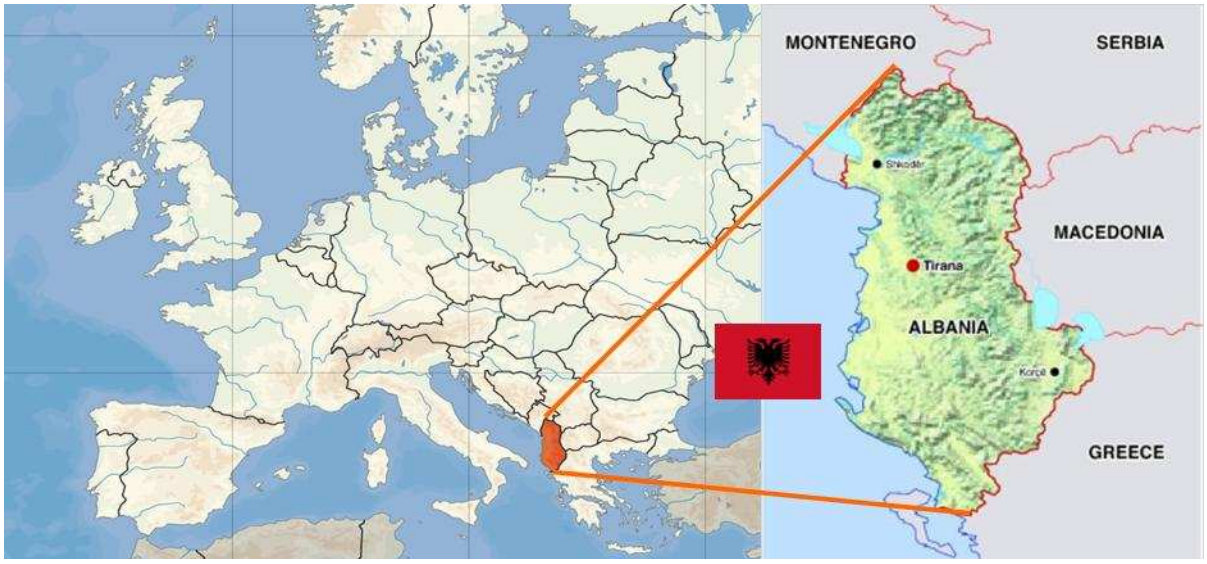


*Figure 3: Location of Albania on the European Continent*

### 4.1.1 General information

In recent years Albania had made significant progress in all fields. Public order and security have been strengthened and institutional reform has made strides ahead. Macroeconomic stability has been achieved while maintaining relatively high growth rates. Structural reforms have been further deepened and tangible improvements have been made in the area of infrastructure. Albania has become a more open economy and its regional and European integration have become attainable prospects. Albania has taken these steps with the support of international partners.

Despite these achievements, Albania continues to have a relatively weak economy, characterized by fragile internal and external macroeconomic balances. Income per capita continues to be among the lowest in Europe. Poverty is relatively high, and economic inequality has been steadily growing. Poverty is most prevalent in the rural areas, especially the remote regions of the country.

The supply with electric power has been very restricted in both urban and rural areas during the last 10 years. The limited and depreciated capacities of the electric power distribution system had to cope with both a vigorous increase of family consumption demand and the unauthorized connections with the network. The problem was especially aggravated by the migration of the population from rural to urban areas. The increased energy supply cost with selling prices being kept fixed, the high number of consumers failing to pay electricity invoices in some parts of the country (partly due to, until recently, some sort of tolerance by

the relevant administration authorities), and the problems related to power supply administration and management led to a further degradation of the situation. The situation worsened particularly during 2000. The energy system was confronted with a crisis situation. The aforementioned problems were aggravated by a very unfavourable weather. The low production capacities, relying almost entirely (95 percent) on water resources and decisively depending on the weather forecast, were strained even further by limited capacities for energy importation. The investment policy in the sector has mainly focused on repairing the defects in the distribution system.

### 4.1.2 Renewable Energy

Albania has experienced an abnormally high growth rate of electrical consumption, averaging an 8.6 percent annual increase since 1992. A large part of that growth has been artificially stimulated by extraordinarily high rates of electricity theft, non-payment of electric bills and tariff rates well below cost. Consumers have failed to conserve electricity or to make adequate use of alternative fuels for the past decade.

The abnormally high demand, together with reduced hydroelectricity production in 2000, 2001 and 2002 caused by reduced river flows, has caused a substantial supply deficit, which has caused a social and economic crisis. Albania's capacity to import electricity is constrained by a transmission system in dire need of rehabilitation and upgrades to expand its capacity.

The artificially high electricity consumption, particularly for electric space heating, has diverted a valuable resource away from commercial and industrial uses that would otherwise create jobs and contribute to economic growth. The Government has subsidized imported power purchases, thereby diverting state resources from other critical government programs. In 2001, the subsidy reached 4.530 million ALL (US $31,5 million). The low production capacities, relying almost entirely (95 percent) on water resources and decisively depending on the weather forecast, were strained even further by limited capacities for energy importation. The investment policy in the sector has mainly focused on repairing the defects in the distribution system.

#### a) Hydroelectric Resources

The major renewable energy source used in Albania is hydro-power. Due to this abundance of hydro-power with very good conditions, the promotion of other renewable energy sources was neglected in the past. Today, 35 percent of the country's hydropower potential is exploited. National Energy Agency (NAE) and the Albanian-EU Energy Centre are quite active in promoting promising options.

The Albanian Power System (APS) was created in 1957. The total installed power production capacity is about 1.650 MW, out of which 1.446 MW (87.2 %) are hydro power plants (HPPs) providing more than 95 % of total energy supply. Total hydropower reserves are estimated at around 3.000 MW. Potential annual generation may reach up to 10 TWh. Three HPP-s constructed on Drini River (north of Albania) compose 80 % of the country's installed capacity. The annual generation capacity of the country has been approx. 3.300 – 3.500 GWh, reaching 5.800 GWh in 1996. With an average rainfall of 1.500 mm and an average available head of about 600 m, there is still an enormous potential to be developed.

The energy production is highly dependent on the hydrological situation. The system faces great difficulties in dry years. KESH, the operator of the APS, is also encountering problems with the technical and "non-technical" losses. The electricity demand has increased considerably over the last 10 years. The residential sector consumes over 60 % of electricity

production. Most heating systems are run by electricity. Through insulation of buildings about one third of energy for heating could be saved.

Apart from the large and medium sized HPPs, there are 83 small hydropower plants (SHPPs) in Albania (owned by KESH) ranging from 0.05 to 1.2 MW. Their installed capacity is 14 MW (this represents 1 % of the APS hydropower capacity) and the average annual production has been about 50 million kWh. Their utilisation scheme is often incorporated for electricity generation and irrigation. Most of them are connected to the national grid. Actually these SHPPs are in poor working conditions or out of work because of the outdated technology, lack of spare parts and poor maintenance. The production level in recent years is about 12 GWh. The potential for small hydro power plants (SHPP) is estimated at around 180 MW. For many of the SHHPs previously or currently under operation, there is the potential of upgrading them to medium-sized hydro power plants.

### b) Wind Energy

There are no operational wind energy power plants in Albania and no projects planned. Some old wind mills are still used for grinding wheat or other grains, as well as water pumping. The total number of such turbines and the current operating conditions are unknown. There are a number of opportunities for the installation of large wind facilities. Additionally, there is the potential for small wind power facilities in the remote zones, where the cost to deliver the fuel for electricity and heat supply is expensive.

Developing wind energy is one of the supported and sustainable options for long-term energy sector development program in Albania. Its development, though, requires strong governmental and international financing support. According to the newly adopted energy strategy, feasibility study should be done for selection of the best sites of installation of wind power farms with total capacity of 100 - 150 MW in the future.

The EU objectives for the next 20 years, is to secure 20% of the electricity supply from wind. In Albania conditions, it is estimated that by 2020, only 4% of the generated power can come from wind energy (some 400 GWh / year). Based on some studies carried out by the NAE, in the costal lowland nearby pumping stations, interesting zones from the viewpoint of wind potential are identified. The most promising sites are located along the Adrian coast, as well as the hills and ridges running in the north to south direction along the coast. It is also highly probable that there are isolated locations in the mountain passes and near the two big lakes at the FYROM border. In these zones average speed of wind, throughout the year, is around 4-6 m/s (10 m height), and the average annual energy density of 150 W/m².

### c) Solar Energy

As regards solar potential, the climate of Albania is typically Mediterranean, with hot and dry summers, offering good precondition for use of solar energy. Most areas of Albania are exposed to solar radiation of more than 1.500 kWh/m² per year. In 2005 almost 3.300 m² solar thermal systems for hot water heating were installed in Albania, supplying both service and household sectors. With the total installed capacity 45 GWh thermal energy per year are produced. The largest solar thermal heating system currently operating in Albania consists of three sets of solar panels totalling 48 m², that are installed from Centre of Energy Efficiency ( founded by EU and National Energy Agency).The Ministry of Energy plans to install solar panels that will provide about 720 GWh of energy by 2015.

There are no installed photovoltaic systems identified at this time, although The Ministry of Energy aims to install enough solar panels to provide 62.9 ktoe of energy by 2015. The total investment cost is estimated at USD 79 million. Investment costs are to be shared between the state budget and private investors.

### d) Geothermal Energy

A large number of thermal springs and wells can be found in Albania, representing a vast potential for geothermal energy. The most important resources explored up to date are located in the northern part of the Kruja geothermal area, from Lixha Elbasan in the south to Ishmi north of Tirana. The values of the specific reserves vary between 38.5 and 39.6 GJ/m². The southern part of the Kruja area has resources of 20.63 GJ/m².

However, to date the geothermal sources have never been used as a source of energy. According to the EBRD country profile, the geothermal situation in Albania offers two directions for exploitation of geothermal energy:

Use of thermal water springs and wells of low temperatures which cover a wide territory from South, near the Albanian-Greek border to the northeast districts in Diber region. The water temperatures reach values of up to 60 °C.

Use of hot thermal waters, brought out from deep doublet abandoned oil and gas wells and single wells, for geothermal energy in a form of a "Vertical Earth Heat Probe". At 2000 m depth the waters temperature reaches a value of about 48°C. In many deep oil and gas wells there are thermal water fountain outputs with a temperature that varies from 32 to 65.50 °C. These waters come from different depth levels (800-3000 m) of limestone reservoirs and sandstone reservoirs.

### e) Biomass Resources

Biomass as an energy source is closely associated to forestry, agriculture, livestock breeding, agro-food industries and urban waste. In the Albanian energy balance, the consumption of fuel wood is quite significant. Wood is particularly used in the countryside and in the mountainous areas of the country. Wood is also used by small and medium scale industries. In 1990 fuel wood contributed with 727,7 ktoe for 27 % of the total heat demand declining to 256 ktoe in 2001 for 13,8 % of the total heat demand. Decline of fuel wood had a positive effect on the reduction of wood cutting for energy scope, but had also negative effects by shifting the load on the electricity sector, especially in the residential sector. Total proven reserves of fuel wood amount to approximately 6 Mtoe.

The potential of urban wastes from the main Albanian cities was calculated as approximately 405615 Toe-ton oil equivalents, predicted for the year 2010. Data on forest resources are based on inventories done every 10 years from the Forestry Directorate subordinated to the Ministry of Agriculture. Forests are classified in these major categories:

- High forests which represent 47-50 % of the total wood resources,
- Copses which are 29-30 % of total resources, and
- Bushes, which are 24-25 % of total wood resources.

The energy potential from agricultural residues was calculated at approximately 43.004 GJ in 1995. Forestry biomass resources were calculated to be approximately 460 millions of GJ in

1995. The energy potential from animal residues was calculated at approximately 12.740 GJ in 1995 with a trend to be increased in the future. These numbers should be considered estimates; a more comprehensive study should be carried out for real validation. The technical and economical wood energy potential for energy production amounts to 315.10 GWh/year.

## 4.2 Analysis of Restructuring and Development Programs

### 4.2.1 Existing Plans and Programs

#### a) Poverty Reduction Strategy Paper (PRSP)

Poverty Reduction Strategy Papers (PRSPs) are prepared by member countries in broad consultation with stakeholders and development partners, including the staffs of the World Bank and the IMF. Updated every three years with annual progress reports, they describe the country's macroeconomic, structural, and social policies in support of growth and poverty reduction, as well as associated external financing needs and major sources of financing. The country document for Albania, dated June 2005, was prepared by the Albanian Government. The Growth and Poverty Reduction Strategy Paper (PRSP) of Albania, focuses on poverty reduction through sustainable and inclusive economic growth. Being a basic factor for the development and modernization of the economy, as well as for Albania's preparation for European integration, growth is a fundamental objective of the Strategy. The objectives of the Growth and Poverty Reduction Strategy are harmonized with the long-term objectives (i) of the transition towards a market economy, (ii) development objectives, and (iii) Albania's objectives for European integration.

As important part of the strategy, the Albanian Government has developed a National Strategy for Socio-Economic Development, NSSED. It is increasingly considered as a basic document that combines the main agendas of government for reducing poverty, for guaranteeing a sustainable economic growth, for achieving the Millennium Goals, for integrating the country into NATO, EU and the region etc.

The 2004 progress Report of NSSED has presented the country's remarkable achievements since the development of the NSSED. In the last four years, all the growth targets have been reached before the planned date. Poverty appears to be falling and most social and economic indicators are improving. The figure below shows that spending has been directed to priority sectors in the 2003 and 2004 budgets. Energy sector is not considered as priority sector. Moreover, the proportion of the budget allocated to energy has been declining during the three years of implementation of the NSSED and this may need to be reconsidered.

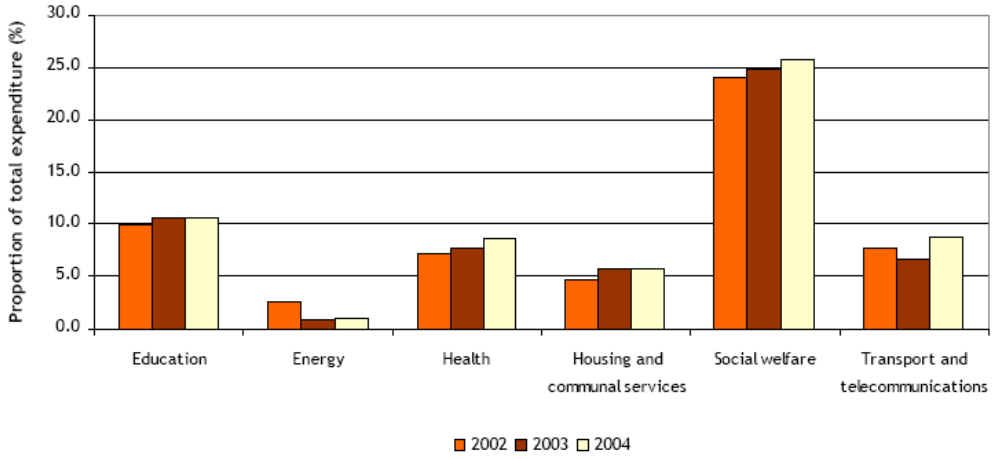


*Figure 4: Expenditure in priority sectors as proportion of total, 2002-2004 (Source: Ministry of Finance, Information and Technology Department)*

The overall situation of the energy sector has improved since 2002. Power cuts continue to act as a disincentive to investment. The implementation of the electricity strategy and the reform of KESH are not only a part of the European integration agenda but also intrinsic components of poverty reduction and growth.

### b) National Energy Strategy

Albania had its **National Strategy for Energy** approved by the Government in June 2003, and after three years the Action plan for implementation was updated and improve by introducing the notion of "Privileged Electricity Producers" (electricity generation below a certain capacity with low environmental impact), for which special favorable operating conditions are foreseen. In this Strategy three main issues are analysed:

Energy demand-supply situation until 2015,

Restructuring energy sector and

Preparation of investment package for the implementation of all energy efficiency measures and all master plans based on recommendation of the National Strategy of Energy.

The scope of the National Energy Strategy is to develop an **effective energy sector** that guarantees the security of the energy supply in general and electricity in particular. It should also enhance an efficient and economic use of energy, **with minimal environmental impacts**, in order to support the **sustainable development** of all economic sectors

Two scenarios of the Albanian Energy System development are anticipated. According to the first, passive scenario, the Action Plan is implemented inadequately which may lead to the total collapse of the energy system. The second, active scenario foresees implementation of additional measures, such as **increasing energy efficiency and introducing alternative energy sources.**

### c) Overall energy sector strategy

In view of the current developments in the electricity sector and the difficult situation of the sector, the government is committed to take the necessary measures to improve as soon as possible the supply of the consumers with energy. The **overall sector strategy** will aim to

ensure an adequate supply of all consumers through the use of alternative energy resources, a better administration of the energy resources of the country, the expansion of the importing capacities and a better balancing of the system.

Particular emphasis will be given to the reduction of the environmental pollution, and the minimization of the risks for the poor. The main directions of the future policies will consist on: (i) completion of the institutional reforms undertaken for the restructuring of the sector; (ii) the full commercialization of production, distribution and transmission ; (iii) the reduction of the non-technical losses, improved collection of electricity bills, and a gradual liberalization of the electricity price , while providing support for the poor groups of the population; (iv) securing adequate financing for investments in the energy sector to complete the programs for the rehabilitation of the transmission, distribution, and production networks; and (v) the consolidation of the regulatory institutions.

The most relevant legal framework bases in the energy fields are:

- Law on Competition (1995)
- Environmental Protection Law (1992)
- Mining Law (1995)
- Petroleum Law (1993)
- Foreign Investment Law (1993)
- Concessions Law (1995)
- Restructuring Power Sector (May 2003)
- Promotion Energy Efficiency and Renewable Energy Sources (April 2005)
- Law on the Purchase and Sale of Urban Land (1995)
- The Athens Process - Creating a Regional Energy Market

### d) Law for restructuring of the Power Sector

In order to develop the Albanian electricity sector in accordance with the development of the Regional Electricity Market (REM), the Albanian Parliament approved on May 19, 2003 the 'Restructuring the Power Sector' Law**.** The main goal of this low is to ensure the conditions for an electricity supply to the consumers according to standard parameters. This will be achieved through an efficiently functioning Electricity market and the development of competition, taking into consideration the protection of consumers' interest, cost minimization in providing electricity service and its capability with the environment. The topics expressed in this law, such as:

This law regulates activities in the electrical power sector and defines the rights and duties of the physical and juridical persons and state administration involved in this sector as well as the procedures for selecting and developing a market model and the rules for an electricity market.

### e) Energy Efficiency Law

Albania signed the Energy Charter Treaty in December 1994, which will serve as the legal basis for co-operation between the signatory countries in the energy field. The Energy Charter has highlighted the contribution that energy efficiency can make to achieving environmental policy goals at a Ministerial Meeting of the 'Environment for Europe' process in Belgrade,

Serbia on 8-10 October 2007. The 'Environment for Europe' process is a partnership between states, international organisations, regional environment centres, non-governmental organisations and other major groups, and seeks to promote cooperation to protect and improve the environment across Europe and Eurasia.

### f) Integration of Albania's electricity market into the EU's Internal Electricity Market

An important policy framework for energy policy has been created through the Athens process. In Athens on 15 November 2002, the SEE countries, including Albania, Bosnia and Herzogovina, Bulgaria, Croatia, Greece, Italy, FYR of FYROM, Romania, Serbia and Montenegro, and Turkey have committed themselves to create a Regional Electricity Market and to introduce European Union Standards in their National Energy Sectors, including the establishment of independent electricity regulatory agencies, by mid 2005. **European Commission and Stability Pact** sponsors as non-participating members the so-called Athens Memorandum of Understanding on the Regional Electricity Market in South Eastern Europe and its Integration into the European Union Internal Electricity Market (see the Memorandum of Understanding). Observers are Austria, Hungary, Moldova and Slovenia. In 2003 it was decided that the Memorandum of Understanding would revised to include the gas sector. The decision of principle has also been taken that the MoU would eventually be transformed into a legally binding international agreement.

### g) World Bank Funds

The World Bank Group (WBG) continues to be a strong development partner with Albania**.** The WBG has provided strong support to Albania since 1991, including IDA commitments totalling US$ 820 million, IFC commitments of US$ 125 million, and MIGA guarantees totalling US$ 8.6 million.

The World Bank's Board of Executive Directors discussed on 10 January 2006 a new Country Assistance Strategy (CAS) for Albania. The CAS is a document that details the Bank's work plan to assist client countries to achieve their development goals. It describes all of the Bank's planned operations in the country—lending, analytical work, and technical assistance. The new CAS - the fourth CAS the World Bank Group has produced for Albania – covers the period 2006-2009 and envisages a lending program of up to US$ 86 million from IDA (International Development Association) and US$ 110 million from IBRD (International Bank for Reconstruction and Development) .

The promotion of renewable energies and energy efficiency doesn't take a significant role within the CAS for Albania. The World Bank policy supports recent plans in the Balkan region for the transit of energy resources due to its strategic location between the European Union and oil/gas rich countries to the east of the Black Sea. Several oil pipeline routes intended to bypass the Turkish Straits are now in competition to ensure sufficient supply and to make the earliest start to their operations. The World Bank funds related to energy sector in Albania are focused on power Sector rehabilitation, generation and restructuring projects. The only intention towards promotion of renewable energy within the CAS can be found within the financing sector. IFC intents to help the banks with leasing, **renewable energy finance products**, housing finance, and derivative products involving swaps to support long-term local currency loans, just to mention a few. World Bank is criticised for this unsupportive renewable energy policy by different NGOs, such as Bankwatch or Southeast Europe Development Watch (SEEDW).

### 4.2.2 Key Actors - Public Institutions

#### a) The Albanian Power Corporation (KESH)

The supply of the consumers with electricity continues to be a government responsibility. The **Albanian Power Corporation (KESH)** was set up in 1993 as a state-owned enterprise. An attempt of the Albanian Government in 1995 for the commercialization of this sector, as a pilot program for the privatization of three distribution units in Vlore, Elbasan, and Shkoder, failed. The three enterprises are in a financial crisis and are planned to be remerged with KESh. The **Electricity Regulatory Entity (ERE)** was set up in 1995. It is responsible for the regulation of the energy sector, including the licensing procedures, approval of tariffs, consumer protection, settlement of disputes etc. The supply of electricity is the obligation of the National Electricity Company, being still a vertically integrated monopolist, but the restructuring of the national Electricity Company is on the way.

The energy prices are still controlled, while the prices of alternative energy resources have been fully liberalized. The technical and non-technical losses in the network are still high, despite the adoption of a series of measures for their reduction. The package of measures taken for the sector's normalization gives special attention to the reduction of these losses and to the collection of debtors' outstanding obligations. The electricity company KESH is receiving management assistance by ENEL, the Italian energy body, through a World Bank program.

#### b) Albanian Government

The **Albanian Government** is advancing with the electricity sector reform, making use of advisors from abroad and in agreement with the EU regulations and agreements concerning the creation of a Regional Electricity Market (REM) in South-Eastern Europe. The general lines of the electricity sector reform are defined in the 'Power Sector Restructuring Law', and single aspect of the reform are outlined in a discussion paper, jointly prepared by Albanian and foreign energy experts (Transition Market Model-TMM). The new power sector law considers the notion of "Privileged Electricity Producers" (electricity generation below a certain capacity with low environmental impact), for which special favorable operating conditions are foreseen.

The new Albanian Energy Strategy, approved by the Government in 2003, follows an 'Active Energy policy' promoting actively the rationalization of energy use to reduce imbalances between electricity demand and supply (for example, reducing the use of electricity for space heating, promoting the use of renewable energy in Albania for example the use of solar energy for hot water production and the promoting of energy efficiency for example, better insulation of buildings due to the new building code; the proposal of an 'Energy Efficiency Law' with the creation of an 'Energy Efficiency Fund' and special programmers such as energy audits for industry).

Public institutions have undergone substantial restructuring since the new government took office in September 2005. The main actors who are relevant for the existing development programs on regional, national and European level are presented in the sector below.

#### c) Ministry of Economy, Transport and Energy (METE)

This Ministry supervises the operation of the energy sector. It has specialised directories for electricity, hydrocarbons, development policies etc. This ministry is in charge of the whole

energy sector, and also for the preparation of its energy policy in line with EU Energy Directives. The Ministry defines policy documents on the national level, and the strategies and policies in the field of energy efficiency. Furthermore, the Ministry of Economy, Trade and Energy reviews energy documents and the medium and long-term strategies according with contemporary standards. Finally it prepares the action plans for the implementation of all energy policies, including environmental issues.

METE is composed of the following Directorates: electro-energy, hydrocarbons and mines (including coal), industry and has under its auspices the National Agency of Energy, the National Resources Agency, the Institute for Product Quality of Oil and Gas, Institute for Pressurized Vessels and Electricity Appliances, National Scientific Centre of Hydrocarbons Research (Oil and Gas Institute), and the Energy Efficiency Centre Albania-EU.

### d) The National Agency of Natural Resources (NANR)

This body is composed by some departments as: Energy Department, Hydrocarbons Department, Water Department, Minerals Department, Renewable Energies Department, etc.

### e) Electricity Regulatory Entity (ERE)

ERE is benefiting from strong support by USAID, experts are providing technical assistance and all types of training necessary for the build up of a regulatory entity.

### f) National Energy Agency (NAE)

NAE was established in June 1998 according to a Government decree as a juridical institution. It is directly subordinated to the Minister responsible for energy issues. It was established as a merger of the former National Committee of Energy and the Executive Agency for Household Heating, both created in the year 1993. NAE advises the Minister responsible for energy, the Government and other ministries on energy related issues. NAE's scope:

Prepare Energy Strategy of Albania;

Evaluate the implementation process of the National Energy Strategy;

Prepare different development scenarios and carry out analyses in the energy field (including energy efficiency) with the goal of steering the Government toward a sustainable development in the energy sector;

Gathering, assembling and analysing data which deals with the production, supply and consumption of energy sources in all economic sectors, creating a database according to IAE and EUROSTAT standards;

Prepare annual energy balance of the country according to IAE and EUROSTAT formats;

Forecast and propose action plans for rational and efficient use of energetic fuels in different economic sectors;

Carry out studies for the promotion of renewable energy sources;

Prepare, in cooperation with other institutions, the environment norms related to exploitation of energy sources;

Draft legal and by-legal acts in the energy sector.

### g) The Institute of Study of the Hydro Technique Units

It is an institute functioning as subordinated of the Ministry of Territory and Tourism Regulatory. This institute has undertaken a lot of studies regarding the possibilities of exploitation and construction of new hydro energetic capacities. In November 2006, this Institute merged into the National Resource Agency as one of its department with the same tasks.

### h) Ministry of Environment, Water and Forest Management of Albania

This Ministry is responsible for implementation of the state policy in the field of nature protection, rational use of natural resources, ecological, nuclear and radioactive safety, and arrangement of ecological preconditions for sustainable development. In addition it is also responsible for the execution of state control over adherence to legislative demands on environmental protection, rational use of natural resources, ecological safety, as well as state supervision of the situation of nuclear and radioactive safety.

## 4.2.3 Key Actors - Non-governmental organisations

### a) Albania-EU Energy Efficiency Centre (EEC AL-EU)

EEC began as an action under the SYNERGY Programme in April 1993 and was officially established in November 1995 with the full support of European Commission and Albanian Government. By establishing EEC, the Albanian Government has fulfilled part of its commitment under "The Protocol of the Energy Charter Treaty for Energy Efficiency and the Environmental Aspects concerned with it", which Albania signed in 1995.

EEC is collaborating with other countries to promote renewable energies and improve the energy efficiency of the Albanian economy, and to protect the environment. EEC provides the technical and other expertise to make this possible. It also promotes the use of renewable energy sources, which besides having a lower environmental impact reduce the rate of depletion of conventional fuels.

EEC is the only specialised institution in Albania that works in the above mentioned fields, and now it has become a self-financed organisation through providing services in the field of the rational use of energy, renewable energies, and its involvement in various programs and activities with the support of the Albanian Government and European Commission. This centre functions as a non-government and non-profit organization, but in close co-operation with the government institutions.

### b) REC Country Office Albania

There is an office of the Regional Environmental Centre for Central and Eastern Europe in Albania.

### c) Albanian Ecological Club International Friends of Nature

The Albanian Ecological Club has 3700 members. It organized the first Environmental Engineer postgraduate student of Tirana University in March 2004 and wrote a project for the first Biogas Plant in Albania using manure from 200 cows. The club hopes to publish how to construct solar panels for hot water in its ecological magazine "Round and round". It aims to

create new experience especially with young people to work for more biogas plants and other Renewable Energy activities.

## 4.3 Formulation of Strategy Options for RES/EE Implementation

The main barriers identified against the implementation of renewable energies in Albania are difficult overall economic conditions and low electricity prices.

### 4.3.1 Renewable Energy Promotion

As regards wind energy there is a lack of any previous studies on wind energy resources potential. Therefore one of the main outputs of the Energy Strategy should be a feasibility study that will identify the best sites appropriate for the installation of the wind power farms with the total capacity of 100-150 MW.

The current cost of solar thermal systems of sufficient capacity to meet the domestic hot water needs of a typical Albanian household represents around 50% of the average annual household's income. Moreover, the relatively low capital costs for the commonly used electrical hot water equipment in the household sector makes it difficult for solar systems to compete. Also, cost of electricity used in this sector is still low and far below actual costs, making the situation more favorable for the electrical water heaters.

Almost all Albanian electricity generation is hydro based at present. The environmental benefits of solar are therefore less market than would be the case if hydrocarbon - fired electricity generation or fuel wood in individual homes were substituted. Another main barrier against broad scale utilisation of solar thermal technology is the lack of operational and reliable water supply networks. In Albania as a whole, only 53% of all buildings are connected to the public water supply networks. The situation is better in urban areas.

A strategy for further development of solar thermal market in Albania may include the following elements:

- Incentives in the form of tax credits or soft loans for solar thermal system applications in new and existing buildings;
- Efforts for developing and local manufacturing of solar water heating systems. This would contribute to a significant reduction on the price of a domestic system, since imported products are mainly expensive state-of-art high tech systems;
- Incentives towards demonstration projects, co-financed by the government;
- Creation of legislative framework for installation of certified solar water heating systems on every new building, starting with new hotels and tourist villages. The installation of domestic systems may be obligatory in certain regions where the electric grid is very weak;
- Information and education campaigns which have been proved to be effective in other Mediterranean countries must be applied;

A greater participation of the Albanian institutions in research and demonstration of solar technologies is expected. Funds to promote feasibility studies and demonstration projects as

well as to allow for participation in international exchanges of information on solar technologies should be available.

The effort for the promotion of biomass should focus on the establishment of a favorable legislative framework, imposing environmental constrains and creating externalities. Experience and public acceptance should be gained through demonstration actions; since the economics are not going to be the motive for biomass utilization in Albania (these are quite marginal even in Western Europe).

In order to utilize the biomass resources in the most optimal way, a broad biomass study which would determine both the right technology and the level of the development is necessary. Briefly, the following topics should be involved in this study:

- A better estimation of the available potential;
- Identification of the relevant technologies for biomass utilization;
- Energy structure and changes after introduction of renewable energy sources;
- Economic considerations;
- National development - job creation;
- Small hydro power.

As regards small hydro-power plants (SHPP) there is large potential for decentralised electricity production. There are many attractive sites in Albania. In general, there is a great potential for small- to medium-scale hydropower plants; as well as for renovation of existing capacities. The implementation of SHPP is currently fostered through the flexible strategy for privatisation of state-owned assets, adopted by the Albanian Government. It can be expected that also in the future there will be cooperative atmosphere between the responsible ministries and the new operators (contractual obligation to in-vest in repair and rehabilitation, increase of electricity generation, etc).

In view of the current developments in the electricity sector and the difficult situation of the sector, the government is committed to take the necessary measures to **improve as soon as possible the supply of the consumers with energy.** The **overall sector strategy** will aim to ensure an adequate supply of all consumers through a better administration of the own energy resources of the country, the expansion of the importing capacities and a better balancing of the system. Particular emphasis will be given to the **reduction of the environmental pollution**, and the minimization of the risks for the poor. The main directions of the future policies will consist on: (i) completion of the institutional reforms undertaken for the restructuring of the energy sector; (ii) the full commercialization of production, distribution and transmission; (iii) the reduction of the non-technical losses, improved collection of electricity bills, and a gradual liberalization of the electricity price , while providing support for the poor groups of the population; (iv) securing adequate financing for investments in the energy sector to complete the programs for the rehabilitation of the transmission, distribution, and production networks; and (v) the consolidation of the regulatory institutions.

Enforcement of the law on fiscal facilities would be a valuable measure to enhance the use of renewable sources. NAE and EEC should undertake awareness campaigns to present the

advantages of these sources (based on the Action Plan for the Implementation of the National Strategy of Energy).

### 4.3.2 Lobby Work to Decision makers

Lobby work, as a tool for increasing the attention towards renewable energies is very important but till now there is not any attempt to establish it. The relevant decision makers to be lobbied in the renewable energy field are the group of deputies of economy commission in Albanian parliament.

### 4.3.3 Possibilities for RES funding within the existing or planned Programs

The German 'Kreditanstalt für Wiederaufbau' (KfW) is one of the most interested banks to invest in renewable energy sector. KfW has prepared some projects to build the Small Hydro Power Plants in Albania.

The World Bank has so far taken the lead role in the sector, and is well placed to continue this role. However, the promotion of renewable energy is given less priority. As mentioned before, World Bank focuses on power sector rehabilitation and restructuring projects. Examples are such as the one which was approved in June 2002 supporting technical assistance, procurement and installation of meter boxes, and rehabilitation of priority components of the transmission and distribution networks in the Durres, Elbasan, and Kucova regions. At the government's requests, the Bank will also support efforts to add critically-needed thermal generation capacity. A planned Thermal Power Project will finance part of the construction cost of a new 100 MW thermal power station.

### 4.3.4 Forging alliances with strong partners like political parties, national utilities or NGOs

The strong partners who could help to create the political and knowledge support needed for obtaining funding and setting suitable priorities for the future are: NGOs, agent bank, fund managers, representatives of the community, parties, the technical assistance facility, financing facility, etc.

# 5 Conclusions

## 5.1 FYR Macedonia

FYR Maceonia has no orientation about the largeness of the home RES, possibilities for their use and incorporation in the state energy balance. Therefore, it's not strange that it has not a defined approach towards the RES development. On the other hand, very bad efficiency of energy use in the country and increasing negative energy balance, taken obligations in front of the EU and according to the Kyoto protocol underline the need for an urgent and wide action to support a large development of home and environmentally friendly energy sources. Bad economy situation and absence of political will hinder organization of such serious activity. However, consequences of neglecting very negative consequences in quite near future press towards its initialization. A strong international financial support and transfer of "knowhow" is necessary for that, taking into account the complicate character of organization.

Need for three parallel directions of the activities have been identified, i.e. (a) organization of investigations and measurements in order to determine the size and techno/economic feasibility of the RES on disposal; (b) preparation of a general and several sub-studies for long, middle and short term development of RES; and (c) urgent organization of demonstration and commercial projects there where possible. Already prepared studies by PHARE and USAID can be a good base for defining elements of all the three actions.

Main constraint for initialization can be localized in the absence of a state body with defined responsibilities for organization of necessary activities, implementation of accepted programs and plans for development. That underlines the need to finalize the foundation of National Energy Agency, its completion with necessary personnel and funds for stabile financing of its work.

Process of implementation needs engagements of different ministries and other state bodies. It is very important to introduce some instruments, enabling the coordination of it in order to overcome the present situation when each one defines own priorities and doesn't follow a commonly defined politics. Very weak legal background, particularly when the instruments for implementation and location of responsibilities are in question, is and shall be an important constraint to successfully resolve the situation. Even a very positive public opinion exists in the country; activities on useful information dissemination should be intensified and particularly lobbing between the localized decision makers.

NGOs can play a very positive role in this process, however when getting own part of responsibilities in the process of priorities determination, organization and implementation of defined plans and programs. A closer and wide collaboration with different UN organization and particularly with the EU in the frame of necessary activities for becoming its member shall be of great help for FYROM in building a positive political will and convenient environment for implementation of a successful program of wide RES incorporation in the national energy balance.

## 5.2 Serbia

Republic of Serbia gets orientation toward use of RES, possibilities for their use and incorporation in the state energy balance. It has a defined approach towards the RES development, because it took obligations in front of the EU. It emphasizes the need for an urgent and wide action to support a large development of its renewable and environmentally

friendly energy sources. In the country, there is still bad economy situation however there is political will to support serious activity toward RES. A strong international financial support and transfer of "knowhow" is necessary for this activity. We would identify need for the following activities.

(1) Creating stimulating regulating framework for greater use of RES;

(2) Providing and executing of financial measures for stimulation of RES use;

(3) Introduction, providing and executing non-financial measures and activities for stimulation of RES use.

The framework for greater use of RES should be regulated through modifications and additions of currently valid laws and provisions of new laws. This is done by harmonization of domestic RES regulations with that of EU, and modifications in Laws for energy, planning and construction, forests, agricultural land, local self-government, waters, transport, and road traffic. Provision of new laws and bylaws is anticipated through bylaw about privileged producers of electrical, heat energy, and bio-fuels, and rule-book about production, examination, and commerce of plants, equipment and devices for use of RES, about tariff system and conditions of connecting of the privileged energy producers to the system for distribution of energy, and innovation of existing and setting new JUS standards related to design, construction, and use of RES objects.

Introducing and implementation of financial measures and activities for stimulation of RES select system of stimulation mechanisms and their introduction to relevant law / bylaw regulative for RES, Establishment of Fund for energy efficiency, Establishment of financial easements for use of RES, and stimulation of domestic companies and local self-governments for investment in use of RES, Set-up of program for long-range credits under convenient conditions for organization and facilitation of production and construction of objects for use of RES, Ratification of Kyoto protocol.

Introduction and implementation of non-financial measures and activities to support use of RES is done as following: organizational and institutional activities would contain defining administrative procedures to obtain necessary permits for construction and use of plants that use RES, determining real potential of wind energy, forming base of data and registry of RES, forming and accreditation of network of certificate laboratories for equipment in RES field, defining type of licenses and method to obtain them for persons that design, construct and use RES, expansion of awareness, promotion of good practice and education. In this entire process, it would be necessary to engage different ministries and other state bodies. Activities on useful information dissemination should be intensified and particularly lobbing between the localized decision makers. A closer and wide collaboration with the EU in the frame of necessary activities for becoming its member shall be of great help for Serbia in building a a successful program of wide RES incorporation in the national energy balance.

## 5.3 Albania

Over the transition period from a centrally-planed to a market-based economy, the country of Albania, like most other transitional countries experienced deterioration in a number of sectors, including the energy sector. In an attempt to address the fundamental issues affecting the energy sector, the Government of Albania is initiating an action to reverse the deterioration in sector performance. Despite the encouraging start, however, the sector's problems are so deep-rooted that sustained efforts will be needed for a considerable period of time, supported by critically needed investments. It will take time to implement the legislative

and regulatory framework needed to attract private investment to the sector. Consequently, donor assistance will be required for several years.

The main directions of the future policies will consist on: (i) completion of the institutional reforms undertaken for the restructuring of the sector; (ii) the full commercialization of production, distribution and transmission; (iii) the reduction of the non-technical losses, improved collection of electricity bills, and a gradual liberalization of the electricity price , while providing support for the poor groups of the population; (iv) securing adequate financing for investments in the energy sector to complete the programs for the rehabilitation of the transmission, distribution, and production networks; and (v) the consolidation of the regulatory institutions. The priority measures in this regard include: (i) the restructuring of KESH, separating the production from transmission and distribution; (ii) the preparation of the sector for its privatization; (iii) Increasing energy generation capacities, encouraging private sector participation; (iv) Connection of the Albanian electricity network into the Balkan and European networks; vi Development of Renewable Energy sector.

## 5.4 Overall Conclusions

This report is based on three country reports, elaborated by the RES-Integration project partners from FYR Macedonia (MAGA), Serbia (MFKG) and Albania (PUT). The partners used a common template, with the aim to elaborate the necessary data platform and to gain comparable results. The main objective of this report is to identify best ways of integrating renewable energy (RE) actions into the large restructuring and development plans for the West Balkan Countries. Theses countries experienced deterioration in a number of sectors, including the energy sector, over the transition period from a centrally-planed to a market-based economy. The West Balkan regions economies are now growing, RE is crucial for sustainable economic development. The financing of renewable energy projects can be realised through foreign direct investments, or more obvious, through bilateral assistance provided in the form of grants given by different donors, such as The European Commission and the World Bank.

In the analysis - part of this report (chapter 2 – 4) each partner has analysed existing and future restructuring and development plans of his country, and has identified the possibilities for RES funding within theses plans. In the strategy – part of this report (5 – 8), the strategy options have been formulated integrating RE actions into the restructuring and development plans for FYR Macedonia, Serbia and Albania. In chapter 10, a compliation is given on the data sources

As a whole, it can be stated that with this report valuable results were gained for the sustainable development of the countries, based on the exploitation of own renewable energy resources. During the preparation of the country reports, it became clear that it would be difficult to focus on developing a strategy for ‚incorporating RES in existing restructuring and development programs'. The actual strategies that have been developed more focus on the aspect how to make best use of the existing funding programs, as financial and political support needed for the implementation of sustainable energy actions.

Each partner has followed a different approach in defining the strategy for his country. The strategy of MAGA outlines clearly the roadmap to a sustainable energy future of FYR Macedonia, comprising 4 steps: 1. Creation of national Energy Agency, 2. Analysis of RE potential and determination of technical and economical feasibility of each RES on disposal, 3. Development of 3 phases strategy (long term, mid term and short term actions), 4. Realisation of Scientific and Demonstration Projects. This strategy, tailor-made for FYR

Macedonia, may also be appropriate for Serbia and Albania. MFKG provided a detailed analysis of national main strategy document: Energy Industry Development up to 2015, and detailed overview on key actors in government and on municipal level. PUT provided a detailed analysis of GPRS.

In Serbia and FYR Macedonia, NGO‘s have minor role in RE strategy development, mainly due to lack of their acceptance by governments. For efficient lobbying, stable political and economic situations are required, which is not always given in the countries investigated. In Serbia, political support for RE exists, but this is not the case for Albania and FYR Macedonia, where absence of political will and commonly defined politics are the main barriers hindering RE implementation. The governments often seem to be under pressure of ‚more serious problems‘, which is the reason why RE is often given lower priority. International support in financial terms and knowledge transfer exists, however its implementation is lagging behind. In general it can be concluded that the awareness level of the population for RE and EE has increased in all three West Balkan countries within the last years. To increase the awareness not only within the population, but also within policy and decision makers will be the cornerstone for the efficient and successful exploitation of own and eco-friendly energy sources in the West Balkan countries, where urgent action is needed to improve the economic situation and energy supply.

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