



Mediterranean and National Strategies for Sustainable  
Development  
Priority Field of Action 2: Energy and Climate Change

Energy Efficiency and Renewable Energy  
Bosnia & Herzegovina - National study's  
summary

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## 1. Challenges and energy sustainability:

Coal insured the largest share of primary energy in Bosnia and Herzegovina in 1991. Coal was provided 59 % of primary energy. Share of the liquid fuels was 26 %. Hydro energy, the only one ecologically acceptable source of energy in Bosnia and Herzegovina participated with 7% in providing the primary energy.

In 1991, primary energy supply (production and import) was 7.8 Mteo, and in 2004 it was 4.71 Mteo.

Total final consumption in 1991 was 5.6 Mteo, i.e. 72% of TPES and in 2004 it was 3.0 Mteo, i.e. 64% of TPES.

### *Coal demand*

The authors of various studies offered different projections of **the potential demand for coal in B&H by 2015**. These projections range from **8.2 to 12.6 million tons** for B&H.

### *Natural gas demand*

With respect to the long-term **projected gas needs** according to World Bank studies done in 1999 is around **1.5 billion m<sup>3</sup>** for the low scenario, **until 2020**. In the case of low growth scenario, the energy policy would be based on the use of national energy sources, with partial use of gas where the domestic energy sources are thought non-competitive or technologically inappropriate. From the aspect of this study, this is what makes this particular scenario realistic and conceptually acceptable.

### *Oil demand*

The **demand for motor fuels** on the domestic market in the present conditions is approximately **1.5 million tons annually**. The oil refinery delivers around 500,000 tons to the market, and the rest is imported. Considering that the number of private petrol stations is on the increase and has reached approximately 300 stations, objective estimates suggest that the commercial capacities in B&H market are already oversized. The present state on the B&H oil products market suggests not only inadequate usage of own production capacities, and large imports of such products, but also the problems of the frequent imports of cheap low-quality products, especially motor fuels. This situation needs to be urgently addressed and the relations on the market improved.

### *Demand for electricity*

B&H satisfies its **electric power needs** in total with the production of electricity from its own power stations (**10.8 TWh in 2002**), using for that its available hydro potential and coal resources. **The situation of domestic consumption enables also the export of part of generated electricity**, which in 2002 were 1.1 TWh. About 60% of electricity has been generated in thermo power plants, and the other 40% in hydro power plants. **The available hydro potentials have been estimated to possible annual production of approx. 22,000 GWh, while the coal reserves are over four billions of tons**. The production of electric energy on today's level is sufficient for satisfying B&H own needs in short-term time period.

### *Energy dependency*

The basic identified sources of primary energy in B&H are coal and hydropower. In 2001, annual production of energy from those sources in B&H amounted to about 62 % of the total consumption of primary energy, which indicates that B&H is dependent on the imports of energy, as certain energy sources, for now, can not be replaced with domestic energy sources.

## Energy bill

**Table 1 Final consumer energy price per fuel in 2003 for F B&H**

Energy source	Oil for heating (in Liters)	Electric power (daily tariff) kWh	Electric power (late hours tariff) kWh	Brown coal in tons	Lignite in tons	Central heating per m <sup>2</sup>
Average retail price in KM (BAM)	1.02	0.14	0.07	107.08	77.43	1.07

Source: Statistical Yearbook of FB&H of 1993-1998

## Energy and climate changes

Bosnia and Herzegovina **ratified the UN Framework Convention on Climate change** on September 7, 2000, and the UNFCCC entered into force on December 6, 2000.

Bosnia and Herzegovina **has not ratified yet the Kyoto Protocol** on the Greenhouse Gases Reduction, but it is currently in the process of ratification.

Regarding the environment protection, the legal and institutional environment is not strong enough for adequate approach to the environment protection problem. The problem of inexistence of inter-sector approach to this field should be added to this as well. The inexistence of the energy strategy of B&H, as well as the appropriate institutional approach and mechanisms for realization of plans precludes B&H from implementation of the requests of Athena Memorandum and Charter in the part related to the environment protection.

Also, the ratification and implementation of Kyoto Protocol for B&H will be necessary, regarding that it will result with the significant opportunities and profits for the economy, as well as with the benefit in the form of reduction of air pollution. That will ensure the more favorable life environment and sustainable development.

## Sustainability degree of energy development and awareness degree of energy issue

There are not enough incentives for introduction of new fuels and technologies which could reduce the negative impact on the environment. Because of that it is necessary to make the reform of subsidies which already have caused the damages in the environment. Besides, the taxes on motor fuel should be introduced, which would be proportional to the damage these fuel cause (e.g. to reflect the carbon content which the fuel is consisted of). The solutions for the improvement in the energy sector lies in the increase of the efficiency of fossil fuel combustion and stimulating the use of renewable energy and new technologies in energy production. It is necessary to concentrate on CO<sub>2</sub> reduction (what means reduction of energy use or transfer to the energy sources with low CO<sub>2</sub> emission).

Awareness degree is low.

## 2. Indicators:

- a. **Share of renewable energy resources in primary energy supply is 8.2 % in 000**, and it is hydro energy. **Potential** for exploitation of geo-thermal energy, wind energy, solar energy and biomass energy have not been sufficiently explored. The potential and feasibility of RE use is going to be analyzed in B&H within the document of national energy strategy which is being drafted within EU CARDS program called "Technical assistance for strengthening of energy department within Ministry of Foreign Trade and Economic Relations of B&H"(TASED project).

### RES estimated potential [GWh]

Small Hydro

2,500 GWh/year

Wind

600 MW that could be developed by 2010 according to GTZ Study

Solar

Theoretical potential is 74.65 PWh per year

Biomass

1,000,000 m<sup>3</sup>/year

### b. Energy efficiency – energy saving

Within the Energy Strategy blueprint for B&H, the Energy Efficiency and Energy conservation sector policy and strategies will be done on the basis of data, knowledge and results obtained both from WB Study and EC CARDS “TASED” Project. The first conclusions from TASED project can be expected at the end of 2007.

**The reduced energy consumption** can be partly achieved by **introduction of district heating**. Most of the current systems do not achieve the satisfactory effects, partly due to inadequate maintenance, and partly because there are no instruments for measuring individual heat consumption of consumers. The possibilities of **combined production of heat and electric power**, an option that is convenient for larger buildings or groups of buildings, are also underutilized.

Buildings are usually not good isolated, energy loss amount up to 30% in winter period. The energy price increase forces the poor to look for alternative energy sources. Domestic consumption of coal, wood and waste is widely spread in the poorest suburbs.

### 3. The currently established policies in terms of RE and URE

a. **B&H will get its Energy Strategy** blueprint through the EC CARDS Programme “Technical Assistance to Support the Energy Department of Ministry of Foreign Trade and Economic Relations in B&H”. Preparation of a comprehensive background energy sectors study is the first step towards the national energy strategy and is in preparation phase financed by the World Bank.

b. There are no official plans for the promotion of RE sources and the plans for increasing the energy efficiency does not exist.

#### c. **Tariff systems for RES electricity**

Decision on methodology of determination of level of purchase prices of electric power from RES with installed power up to 5 MW was adopted (Of. Gazette FB&H 32/2002, Of. Gazette RS 71/2003).

Two power utility companies in B&H and one in RS are obliged to take over the electricity produced from RES. According to decisions, the tariff systems for RES electricity:

- Small Hydro plants: 3.96 € cents/kWh
- Landfill biogas and biomass plants: 3.81 € cents/kWh
- Wind and geothermal plants: 4.95 € cents/kWh
- Solar power plants: 5.44 € cents/kWh

d. **Incentive economic tools** do not exist.

e. **Specialized institutions** do not exist. No training and education actions.

f. **There are some projects** (USAID, UNDP) and associations of citizens (CETEOR, COOR, CENER, CEET) and also centers dealing with this issue within the Faculties of University in Sarajevo, Banja Luka, Tuzla, and Mostar.

### 4. Difficulties, possible solutions, needed reforms:

a. The level of energy efficiency, i.e. energy intensity in B&H is among the latest in Europe. This means that in this field it is necessary and is possible to do significant improvements. The main problem for this field is that the institutional and legal framework does not exist.

b. The first task of the sustainable development of energy sector of B&H is reducing energy intensity in the entire life cycle starting from the primary energy production, raw material processing and production and up to the product and final energy forms

conversions into money and life quality. This includes also the use of waste heat in industrial facilities, as well as in agriculture.

The second task is increasing the energy efficiency of fossil fuel usage (small energy cogeneration, use of the condensation boilers, use of the flue gases heat).

The third task is gradually transition to the unconventional energy sources (biomass use, passive use of solar energy, larger use of hydro potential for small power plants).

The most important step is now development of the energy sector strategy by which the priority directions of the energy sector development and decision to use RES will be established, as well as the instruments and dynamic for its implementation; It is necessary to develop Feasibility studies on RES use (wind and solar energy).

It is necessary to simplify the procedure for obtaining the concession and license for the construction of RE installations. It is necessary to stimulate the private sector for investments, moreover for the development of all segments of energy infrastructure.

## 5. Success stories

The transition of the energy sector and industry to the sustainable forms of development cannot be expected without finalization of the privatization process in these sectors. However, the privatization is not the only aim. It is only the one component of the transition. The transition must be both the technological and environmental in the same time.

The examples for this in B&H are very rare, but the extraordinary example is the Cement Factory in Kakanj, where the privatization process included technological and environmental restoration, as well as the introduction of new, more modern management system.