

BOSNIA AND HERZEGOVINA

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1. OVERVIEW OF THE REGION

Characteristics of the Region

The country of Bosnia and Herzegovina has an area of 51,129 km², and a population of 3,800,000 inhabitants. The state consists of two entities, the Republic of Srpska (RS) and the Federation of Bosnia and Herzegovina (FB&H). In 2011 the GDP per capita was €3,570 and the employment rate was 72.8 % in 2011.

The climatic conditions within Bosnia and Herzegovina (B&H) are rather varied: the northern part has continental-moderate conditions, the central part has mountain conditions and the southern part has Mediterranean conditions. The average summer temperature is 15 °C and average winter temperature is 5 °C.

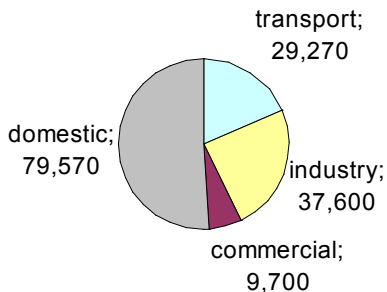


Figure 1 – Total energy consumption by sectors in TWh

Energy demand and supply of the Region

The total energy consumption is 156,140 TWh. Figure 1 presents the distribution of the energy consumption by sectors describing temporary industry development in B&H. The domestic energy consumption is the most dominant factor and the industry consumption is just a minor percentage of the pre-war industry level.

Total energy consumption by fuel is presented in Table 1.

Fuel Type	Share
Residual Wood	30.2%
Oil	26.8%
Electric	22.2%
Coal	10%
Gas	6.7%
Heat	3.1%

Table 1 – Share of energy consumption by fuel

Table 1 reveals that a residual wood is prevailing energy source. Mostly, it is used for heating in households without any pre-processing. Also, when burning out the air pollutants and dispersed in the air without any filtering before.

The share of energy sources for electricity production is 60% for thermal power plants and 40% for hydro power plants. The GHG emission factor for the electricity mix is 1.326 kgCO₂eq/kWh. The electricity produced originates from large scale conventional sources; large hydro and thermal power plants, there are no wind or solar farms so far.

2. CURRENT SITUATION: TARGETS RELATED TO ENERGY POLICY

Bosnia and Herzegovina (B&H) is about to adopt and implement regulations, mostly set by EU, in order to decrease CO₂ emission and increase total energy efficiency. B&H is member of many international agreements for the regulation of issues concerning energy efficiency and climate change. One of these is the EU Energy Community Treaty for South East Europe, signed in 2005. It is a joint regulatory framework for the cooperation within the energy market of South East European Countries and the EU covering energy, and environmental issues, fair competition, electrical consumer legal protection and oil and natural gas issues. Besides these, B&H has the duty

to implement directives for increasing energy efficiency in households and the generation of renewable energies among others (85/337/EC, 92/42/EEC and 93/68/EEC, 96/57/EZ).

The total GHG current emission in B&H from all sectors is 31,276 ktCO₂eq. According to the report by the Centre for Policy and Governance “Energy Sector Policy Report in Bosnia and Herzegovina”, the 2009 target set in 2009 for GHG reduction is from between 5 and 10% until 2020.

There is a great potential for an increase in energy efficiency in B&H. Currently, the energy needed to produce \$1,000 of GDP is twice as high if compared to the world average. There is also a great potential in energy savings in the field of building retrofit, as the heat dissipation from buildings is enormous. Most of buildings in B&H have no thermal insulation at all. Since August 2013 public buildings over 500 m² of useful space have to provide a energy certificate, which has to be publicly available (3). Other buildings have to provide the energy certificate before the owner/tenant gets the authority approval to use the building.

Regional targets, barriers and drivers

So far there are no specific regulations and laws imposing rules and restrictions concerning building insulation, windows and overall energy efficiency, neither regional nor national scale. Also, there are no regulations and laws preventing or encouraging individuals, local communities or regions to apply measures or install materials in order to prevent energy dissipation and consequently increase energy efficiency. Thus, local communities and regions are free to choose their own approaches and methods for increasing the energy efficiency of the building sector. Furthermore, because local communities are responsible for the household heating, investments in building insulation could decrease the costs of heating and consequently save money with regard to the city budget.

The general barriers for energy efficiency improvements in B&H in all buildings are: no proper institutional structure and responsibilities; lack of drive by bureaucrats and administration; aversion to political risk

and corruption. Other barriers particular for B&H include fixed electric energy prices, which creates a high share of domestic heating through electricity, together with a lack of public awareness of energy efficiency, a lack of material and human resources, and a lack of financial resources for sustainable and energy efficiency projects. (2)

There are some activities acknowledged to remove these barriers:

- *enhancement of legal and institutional framework for energy efficiency in B&H;*
 - establishment of agencies for energy efficiency and other responsible authorities, i.e. regulatory bodies or departments in local or state governments responsible for these issues;
 - feasibility studies, plans, estimates for energy efficiency;
 - energy labels for buildings;
 - installation of information systems for energy consumption monitoring.
- *sustainable and long term financial incentives for energy efficiency measures in B&H:*
 - establishment of domestic funds for environmental protection in order to provide long term financial support;
 - access to international funds.
- *Improvements of energy efficiency at a local level:*
 - cities/municipalities support, for example free of charge few advertising panels in public places and local media, permissions for promotional activities in schools;
 - support of pilot projects on a local level.
- *Increase of public awareness of energy efficiency:*
 - strong media support of energy efficiency and energy management;
 - establishment of multimedia information and education centres for energy efficiency;
 - establishment and promotion of “Energy certificate of B&H”.

Responsible Ministries in both B&H entities should create a legal framework for the implementation of these activities and extend them to local communities. It should be possible to adopt appropriate strategies with

a high level of freedom to adapt them to the individual need of each local community.

Also, in the near future, it is expected that first large scale projects for the utilisation of renewable energy sources will be installed and integrated into the power system of B&H. The first one expected is the wind park in Trusina, in the southern region with an installed power of 45 MW. The investor has already provided permissions from both the regulatory agency and the power transmission company. Furthermore, a Wind Atlas for B&H has been created where the southern part of the country is acknowledged as the region most suitable for large scale wind plants. The southern part of B&H has also potential for solar power generation, but it is estimated to be lower than the one of wind power. The installation of these systems for the use of renewable sources offers great opportunities for a major increase of energy efficiency and for a significant decrease of CO₂ emissions in B&H.

3. CASE STUDY: DELTER

B&H has not fulfilled the requirements of the EU Energy Community Treaty for South East Europe regarding energy efficiency improvements and renewable energy deployment. In order to support B&H, the EU has approved a grant for the project 'DELTER'. DELTER is an EU financed project dedicated to "Support Bosnia and Herzegovina to meet the requirements of the EU Energy Community Treaty for SEE focusing on Energy Efficiency and Renewable Energy".

The project started in late October 2010 with an project office in Sarajevo and lasted over 2 years. DELTER members are very active throughout the country to implement the project equally in both B&H entities and District Brčko (4).

The partners in this project are the Ministry of Foreign Trade and Economic Relations (MoFTER) at State level, Ministry of Energy, Mining and Industry (MEMI) of Federation of B&H and the Ministry of Industry, Energy and Mining (MEED) of Republic of Srpska. Additionally, both Ministries of Spatial Planning of the entities are involved in the project.

Each of them is providing significant contribution to make DELTER successful. The consultation company "Eptisa" from Spain has been engaged to support the project implementation.

Initial conditions and local situation

B&H is a country with very low energy efficiency awareness and a weak legal framework in this sector. The large amount of energy needed for \$1,000 GDP alerts responsible authorities in B&H to start activities to tackle this situation. Most of obligations signed within the EU Energy Community Treaty for South East Europe have not been fulfilled yet, as there is no energy consumption data base, no liberated electricity tariffs implemented, and no plan for citizens, who need support after the subsidies stop. Furthermore, there is a lack of a proper energy efficiency framework and a strategy for investment implementation in the gas and electricity sector. Another barrier is the lack of a legal framework for the protection of gas suppliers and distributors, and the lack of a developed gas network.

Objectives and methods

The main goal of DELTER was to prepare future laws for the increase of energy efficiency in all types of buildings. One of the activities within DELTER has been to help in the preparation of materials for energy efficiency law. Both B&H entities have delegated representatives, together with experts from the DELTER project, in working groups in order to prepare a draft for the legal requirements. As a result, the final version of energy efficiency law was a combined effort of foreign experts and domestic representatives.

The goal of this activity was the preparation of a legal framework suitable for both B&H entities, taking into account all European requirements, moving B&H closer to obligations of the EU Energy Community Treaty for South East Europe. Information from these working materials will be used to present ideas in how to establish strategies for increasing the energy efficiency in B&H. According to the authors of the documentation, special attention should be paid to local communities.

The project consists of 4 components, which are:

- 1 Implementation of demonstration projects in the area of energy efficiency and preparation of two large feasibility studies in the area of energy efficiency and/or renewable energy;
- 2 Training and education of future experts in energy efficiency;
- 3 Public education about the topic of energy efficiency and renewable energy;
- 4 Elaboration of a legal framework in the area of energy efficiency and renewable energy (4).

Component 1 is the most practical part of this project. Nine demonstration projects throughout B&H, with equal distribution amongst the Entities, will show how energy efficiency can be put into practice.

Applications were received from 25 municipalities. Energy-saving potentials were examined by energy specialists and the projects were ranked based on energy efficiency, feasibility and environmental impact. A Selection Committee made the final selection of the projects (small demonstration projects), which will receive EU funding. In return, municipalities agreed to contribute in the form of installation and civil works.

Component 2 comprises training in the area of energy efficiency (EE) and renewable energy (RE) which is essential for target groups. The methods of training are in the process of being developed. An important part is appropriate training, which will be conducted throughout the lifespan of the project. The training of prospective experts will predominantly be addressed to municipal and cantonal staff of both B&H entities

Component 3 is a very important part of the DELTER project – public education and communication. While component 2 of this project is responsible to train people to have some skills and be able to transfer achieved knowledge further, component 3 of the project should have a broader impact on many target groups. The different target groups are:

- municipality representatives and other civil servants;
- media;

- teaching personnel at universities and high schools;
- students;
- NGOs and other groups of the society;
- entrepreneurs;
- general population of B&H.(4)

Due to very low awareness of energy efficiency DELTER pays special attention to the project component 4.

There will be many activities in future periods under this component. For example, regular information on DELTER development will be circulated, accompanying all DELTER components and report on the outcomes. A study tour with workshops and presentations for personnel in local and state authorities is organised to attract their attention and hopefully involve them. The website established is supposed to be the main communication tool and herewith to become a platform containing different information on energy efficiency and renewable energy related mainly to B&H and the Western Balkan countries.

Realisation and outcomes

Besides training, public education and communication, DELTER is planning to implement nine small demonstration projects on energy efficiency in nine cities across B&H: Neum, Jajce, Tesanj, Zenica, Prnjavor, Trebinje, Zvornik, Visegrad and Brčko. These small projects will take place in municipal buildings such as administration buildings, schools, kinder gardens etc., and will mainly focus on windows replacement and energy efficient lighting.

Suitable candidate municipalities were selected based on eligibility criteria such as location (Federation of B&H or Republic of Srpska), size of population, and institutional capacity. In total 29 municipalities were invited to participate in close consultation with both B&H entity Ministries. These were distributed evenly from both entities and one from the District of Brčko. DELTER finally received 25 applications fulfilling the criteria, 12 from FB&H, 12 from RS and one from the District of Brčko. DELTER representatives conducted energy audits of all 25 buildings proposed by the applicants.

Based on selection criteria such as location (FB&H or RS), energy savings, environmental impact, institutional capacities, and technical/economic feasibility, nine small energy efficiency demonstration projects were selected in close cooperation with both entities Ministries and one in the District of Brčko.

Detailed energy audits were conducted at all nine locations and DELTER prepared detailed designs and procurement documents for the nine projects.

Mayors from each beneficiary municipality and the EU Ambassador signed a Memorandum of Understanding specifying the conditions for participation and cooperation.

Tendering was performed by the EU Delegation in Sarajevo in an open tendering procedure. The deadline for tender submission and the date of tender opening was in May 2012. Besides technical assistance provided by the DELTER project, the EU Delegation in Bosnia and Herzegovina has, under a separate budget, allocated an additional €400,000 for small demonstration projects on energy efficiency, which has been distributed between the nine projects. The budget is only for technical equipment, and the beneficiaries will have to finance installation works at their own expense (5).

The most valuable aspect of this project is contribution to future laws in energy efficiency in both entities. The draft for this law is currently being prepared and is expected to be accepted by both Entities with only minor changes to the original draft. This law will create a legal framework for the financing of energy efficiency projects in the future, which is one of the most important issues.

Discussions with local authorities were carried out, and local communities recognized the need to adapt local laws in line with the national energy efficiency laws.

Results

The project has already achieved significant results with regard to increasing the public awareness of the importance of energy efficiency. The training sessions and seminars have emphasized the essential issue, which is the very low level of energy efficiency implemented to date in many sectors in Bosnia and Herzegovina. Special attention has been paid to building energy efficiency, and there have been suggestions and actions proposed to improve this situation. Nine small demonstration projects are about to reach their final phase in nine public buildings in different cities across Bosnia and Herzegovina. These demonstration projects should be good examples for local communities, demonstrating how to save energy and money, and offering further opportunities for similar projects in the sector of public building only.

DELTER has created strong communication within local communities and suggested some preliminary activities before the new energy efficiency law implemented. These include: monitoring of energy consumption of public buildings; engagement of one employee in each municipality to promote energy efficiency importance among local industry stakeholders; allocation of part of budget for energy efficiency projects and preparation of a priority list for energy efficiency projects.

4. CONCLUSIONS

Bosnia and Herzegovina is a region with very low energy efficiency in every sector. Public awareness is at a very low level. In order to follow regulations set by the EU in the energy sector, Bosnia and Herzegovina has started to make first steps by making energy efficiency improvements. Public education, training and demonstration projects have been implemented to initiate this process.

The DELTER project started in 2010 with the main goal to work on the preparation of future laws associated with energy efficiency. DELTER is also recognised as an important tool for local communities to improve public buildings as part of the energy efficiency project and to support further energy efficiency projects/plans in local communities.

5. REFERENCES

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This publication is a section of the book
“Smart Energy Regions”

Published by The Welsh School of
Architecture, Cardiff University,
Bute Building, King Edward VII Avenue,
CARDIFF, CF10 3NB, UK.

Publication date: May, 2014; ISBN: 978-1-899895-14-4.



The COST Action TU1104 Smart Energy Regions brings together over 70 researchers from European institutions to investigate the drivers and barriers that may impact on the large scale implementation of low carbon technologies in the built environment. The book “Smart Energy Regions” is the outcome of the Working Group 1 of the Action and collects analysis and case studies from 26 European countries. For more information about the Action and COST please visit www.smart-er.eu and www.cost.eu.



ESF Provides the COST Office through an EC contract

COST is supported by the EU

RTD Framework Programme



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This publication is supported by COST.