

"Sustainable Development Projects as Opportunity for Economic Development of Bosnia and Herzegovina"

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Abstract

The global climate changes as a worldwide phenomena are on the top of the agenda of most states and international organizations. The adverse effects we currently feel and even worst things to come are stressing the need for action and firm resolution of this problem. In this sense, the need for "environment friendly" energy is becoming top priority and renewable energy sources are in high demand. Furthermore, many countries are noticing this as a development potential and are investing in this sector. One of these countries is Bosnia and Herzegovina with its unlimited natural resources including wind, water etc. This paper will analyze ongoing and planned projects in the area of renewable energy and economic benefits Bosnia and Herzegovina will experience from it. Furthermore, after the adoption of Kyoto Protocol and creation of state agency Bosnia and Herzegovina is now eligible to apply for CDM (Clean Development Projects). These projects are financed by developed countries and are to be implemented in developing countries. It goes without saying that this is enormous opportunity for Bosnian companies and agencies to apply for these projects and bring foreign investments that will boost domestic economy. Besides this, the journey of Bosnia and Herzegovina towards European Union is requiring various laws to be adopted and implemented. One of these laws are rules and regulations related to the various aspects of climate changes and ways on how to combat climate changes. Financial incentives that European Union is providing to "green energy" companies and renewable energy sources are additional motivation for Bosnia and Herzegovina to develop this are furthermore. Thereby in this paper I will address the current issue of climate changes and the need for renewable energy sources. Special focus will be on Bosnia and Herzegovina and the opportunities for economic development available through investing and working on "green energy" and renewable energy projects. I will analyze current projects and future planned projects and their impact on economic development of Bosnia and Herzegovina. The focus of the research will be on various documents, projects and analysis currently available for this purpose. The main finding is that Bosnia and Herzegovina is truly a country with great potential for investments in renewable energy projects and the research paper will provide abundance of arguments for this statement.

Keywords: sustainable development, developing countries, Bosnia and Herzegovina, renewable energy, “green energy” projects, economic development, CDM (Clean Development Mechanisms)

1. INTRODUCTION

Global climate changes are a long term changes in weather conditions including temperature, rain, wind, level of water etc. According to many scientists and organizations including United Nations Intergovernmental Panel on Climate Change (IPCC) these changes are mainly caused by human actions that include increased level of greenhouse gas emissions. Furthermore, scientists are predicting temperature increase in the range of 1.1 to 6.4 °C depending on the extent of the current greenhouse gas emission (The Carbon Neutral Company, 2012).

Main sources of greenhouse gas emission are fossil fuel burn, industrial processes, waste disposal, and traffic. The emitted gas is contained within Earth’s atmosphere and that way the temperature is increasing and producing adverse effects. At the next stage, these adverse effects will result in the extreme weather conditions, destruction of biodiversity, expansion of desert area, rising sea level, spread of diseases, and possible disappearance of Gulf Stream. It is obvious that the dramatic events will occur unless humanity find new ways to combat climate change problems. One of the solutions offered is the concept of “environment friendly” energy that will provide new sources of energy. In the following part, we will briefly examine the various sources of this type of energy.

2. Concept of “Environment Friendly” Energy

“Environment friendly” energy or “green energy” is usually considered to be made of the following technologies and processes: biomass, solar energy, hydropower etc. Biomass as a renewable energy source is biological material from living, or recently living organisms (Biomass Energy Centre, 2011). Biomass energy derived from organic substances has been used for thousands of years as from the moment when people started to use wood for cooking and heating. Even today the wood is most important source of biomass energy. However, many other materials including plants, wood industry waste and organic component of industrial scrap are usable for production of biomass energy. Next technology is solar energy has been used since the ancient times through the application of evolving technologies. Solar energy technologies include solar heating, solar photovoltaic, solar thermal electricity and solar architecture, which can make considerable contributions to solving some of the most urgent problems the world now faces (Solar Energy Perspectives: Executive Summary, 2011).

Hydropower is mostly associated with the production of electricity through use of energy of falling water. Energy produced this way is called hydroelectricity and it is being produced with the use of dams. Bosnia and Herzegovina did not use its entire hydropower potential since it is using only 40% of available capacity which is low level compare to some other countries. In year 1991 there was 11 small dams which represented only 4,4% of available capacities. However in the last few years there is rapid expansion in building of small dams with hundreds of projects being constructed or waiting for approval. In year 2008, Bosnia and Herzegovina operated with 14 big dams and with several of small dams that generate total 28,3 MW of electricity (Energis, 2010). Finally, wind power is the process of conversion of wind energy into a practical form of energy. This can be done in several ways but mostly used are wind turbines for production of electricity, windmills for mechanical power, and wind pumps for drainage.

3. Global Trends in Sustainable Development Projects Investments

Sustainable development projects are attracting interests of investors and there has been a steady rise in the funding of these types of projects. The projects being financed include biomass, geothermal and wind generation projects, hydro projects, solar projects, marine energy projects, and biofuel projects. According to analysis conducted by Bloomberg, year 2010 was record setting in the amount of money of \$211 billion being invested into sustainable development (Bloomberg New Energy Finance, 2011). These funding were used into various areas including: technology research and development, manufacturing scale up, production etc. Furthermore, striking feature occurring in the couple of last years is the fact that developing countries overtook developed countries in terms of investments. This has been mostly due to China heavily investing into various projects amounting up to \$48.9 billion (Bloomberg New Energy Finance, 2011). As time goes on, the interest for sustainable development projects can only increase and attract more investors from both governmental and private sector.

4. THE OVERVIEW OF RENEWABLE ENERGY AND SUSTAINABLE DEVELOPMENT PROJECTS IN BIH

4.1. Hydropower Potential

Small dams, along with biomass energy, are currently the most significant source of renewable energy in BiH, and their development should be a priority when defining strategy and policy for the sector of renewable energy. There are various evaluations about the potential of small dams but there are no major differences between them. In the past studies of JP EPBiH (conducted prior to year 1992) the hydro potential of BiH is evaluated around 99.256 HWh/year, technical potential of 23.395 GWh/year, and of which 2.599 GWh/year is related to small dams with installed power of 700 MW that could be achieved by building around 800 small dams with average capacity of 700 MW (Aleksandar Knezevic and Martin Tais ,2007). According to study of EPBiH, technical potential of rivers eligible for small dams construction is around 100 MW or 12.64% of total hydro potential of BiH. According to ADEG, the potential for small dams construction is estimated on 1,004.63 MW or 3.519,74 GWh. Out of this, Federacija of BiH posses 2.090 GWh, and Republika Srpska 1.430 GWh. Also, according to ADEG, a study has been conducted for around 160 locations for small dams, and estimated capacities of those facilities were around 122 MW, which is 552 GWh of electric power (Aleksandar Knezevic and Martin Tais ,2007).

4.2. Biomass energy potential

The most significant source of biomass for the purpose of energy production is a wood and related waste produced in lumber industry. However, remaining of biomass from agriculture also represent a substantial energy potential especially in the regions of northern, central, and southern Bosnia and Herzegovina. Prior to year 1991, big companies from lumber industry used wooden waste to produce steam within their own facilities and using available technology. However, these facilities are now outdated and they run business creating huge losses, or are completely shut down. The most detailed analysis has been done through EU/FP6/INCO/ADEG project, and in the table below we can see the results (57% of the potential is related to Federacija BiH, while 43% to Republika Srpska). Besides this evaluation, it is worth of noting that assessment for the waste solely from lumber industry are around 4,45 mil.m3 (Aleksandar Knezevic and Martin Tais ,2007). However it must be noted

that none of the evaluations clearly defined what kind of potential is being described, whether it is theoretical, technical, economic, or ecological potential.

4.3. Solar energy potential

Bosnia and Herzegovina on average has around 1840.9 solar hours, while on the south that value is even higher and is around 2352.5 h/y. Theoretical potential for solar energy in BiH is around 74.65 PWh which is 1.25 greater than the total of primary energy necessary for Federacija BiH. Bosnia and Herzegovina is country with favorable conditions when it comes to radiation of sun heating. According to available data, the sun is annually transmitting 1,250 kWh of energy in northern Bosnia, and 1,600 kWh energy in southern Bosnia. It is reasonable to claim, considering the declining costs, that number of installed solar panels in BiH by ear 2015 could reach the area of 50 000 m². This capacity could annually produce around 33 GWh of solar energy.

5. CDM Projects in Bosnia and Herzegovina

The view that human activities have resulted in global climate changes is supported by current scientific thinking (NRC, 2011). From the onset of industrial revolution till the present days of mass production, the damage to environment that industry caused has been immense. Since the level of climate change has reached dangerous level, it was of utmost importance to address issue on a global scale. At this point, The United Nations Framework Convention on Climate Change has been produced in 1992, and Kyoto Protocol subsequently adopted in 1997.

Beside national laws, Kyoto Protocol established market based mechanisms to combat the climate changes. Those measures include the following:

Emission trading

Clean Development Mechanism (CDM)

Joint Implementation (JI)

We will focus on Clean Development Mechanism which is allowing Annex I countries to meet their target by investing globally into emission reduction projects. Through this mechanism the Kyoto Protocol is offering industrialized countries cost-effective way of reducing their emission and it benefits developing countries with new investments, and thereby CDM is "important instrument in fight against climate change"(Schneider, 2007) CDM projects can earn credits, so called CER (Certified Emission Reduction), where each credit is equivalent to one tone of CO₂. Credits can then be sold to contracted parties within Annex B of Kyoto Protocol. In order for project to earn CER, it must present verified analysis that will prove that the carbon emission reduction occurred, its proven and that the project is solely responsible for that reduction.

Bosnia and Herzegovina ratified UNFCCC on May 17, 2000. The Kyoto Protocol was ratified on April 22, 2007, after lengthy procedure that included ratification of agreement by various state levels. But due to complicated procedures, BiH constituted Designated National Authority only in September, 2011. Because of this delay the country missed investments worth in millions of Euros that were part of Clean Development Mechanism (CDM). Head of UNDP Regional Office in Banja Luka stated that "the establishment of the DNA enabled Bosnia and Herzegovina to start implementing the CDM projects of about EUR 400 million

worth investments” (UNDP, 2011). Since Bosnia is non-Annex I country it is thereby eligible to receive investments that are to reduce carbon emission, but has no any obligations to reduce level of emission. The economic benefits would be worthy as it would boost economy and create additional jobs. Furthermore, Bosnia has a great potential in renewable energy sources including wind and solar energy. The region of Hercegovina is especially favorable to renewable energy projects and by developing high quality CDM projects, Bosnian companies have chance of attracting foreign investments.

6. Activities of EU and other international organizations

The biggest challenge of the modern era both globally and more profoundly in EU is the issue of climate change, growing dependence on energy import, and restriction on free access to energy resources. European Union prepared and is currently implementing ambitious energy policy – the one that includes full spectrum of energy sources ranging from fossil fuel, nuclear energy, and renewable energy (solar, wind power, biomass, geothermal energy, hydro power)-aimed at starting new industrial revolution that will create economy with lower energy needs.

Bosnia and Herzegovina is clearly oriented toward EU integration. Led mostly by its participation in The Energy Community Treaty for South Eastern Europe, BiH made some important steps in adjusting its energy system and market mechanisms to the international standards listed in international treaties, policies and best practices. Beside ECT SEE which also includes signing certain EU rules for energy sector, BiH signed Stabilization and Association Agreement (SAA) with EU, Energy Charter Treaty (ECT) and Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA), ratified Kyoto Protocol, as well as many other international treaties. Those other treaties and projects include cooperation with Instrument for Pre-Accession Assistance (IPA) funds, UNDP, World Bank, EBRD, KfW, bilateral projects of technical assistance etc.

Another influential international organization that is playing its part in BiH when it comes to sustainable development and renewable energy projects is GEF (Global Environmental Facility). GEF has been founded in 1991 as a international financial mechanism for financial and technical help to the developing countries with the aim of helping them achieve international treaties they signed. Bosnia and Herzegovina is also participating in GEF, and the following projects are currently being implemented: "National Capacity Self Assessment for Global Environmental Management", "Promoting Energy Efficiency in Buildings", "BiH Biomass Energy for Employment and Energy Security Project", and "Preparation of the Initial National Communication the United Nations Framework Convention on Climate Change – UNFCCC".

7. CONCLUSION

As presented through this paper, the renewable energy projects and sustainable developments have truly a great potential for economic development of Bosnia and Herzegovina. Through the development of different kind of green energy, participation in CDM Projects, and partnership with EU, Bosnia and Herzegovina can truly develop its economy and create new jobs. Nevertheless, it is important to note that the country still did not use even the smallest available potential in this area and there is still a long way ahead. But the prospects for the future are good and look promising. In the coming period there will be a need for greater involvement of state in this sector. The modern laws harmonized with EU regulations will be

key in enabling Bosnia to attract foreign investments in this sector. Furthermore, NGOs and governmental agencies will need to educate themselves in order to be able to apply for various funds available in EU. Hundreds of millions of euros are available, but the projects proposal must be of high quality and skillful people are key in bidding for these funds. Overall, Bosnia and Herzegovina must continue the same way but should accelerate reforms and adjust its market to more easily accommodate foreign investments in green energy and sustainable development sector.

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