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STUDY ON RENEWABLE ENERGY AND ITS EFFECT ON REDUCING POWER SHORTAGE OF BANGLADESH

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Abstract

Growth of population and industrialization has resulted in increasing demand for energy worldwide. Most of this energy is derived from fossil fuel (coal, gas, oil), which is available in limited quantities and unable to meet the demand of the future generations. On the other hand, the conversion of fossil fuel into consumable energy, like electricity continues to cause irreparable damages to the nature and environment due to Green House Gas emission. This has necessitated increased demand on Renewable Energy Technologies (RET) for all countries of the world.These include solar, biomass, wind, micro-hydro and other technologies as available in each country. In Bangladesh the most abundantly available renewable resource are solar and biomass. There is some possibility of wind and micro hydro based energy development although they are very little in quantity and specific to some locations only.The objective of the study is to analyze the present scenario of energy sector in Bangladesh and find out the prospects of renewable energy in Bangladesh. To identify the existing power shortage of Bangladesh and to provide some policy recommendation for the development of power sector in Bangladesh.

1. Introduction:

Energy is one of the basic ingredients required to alleviate poverty and expedite socio-economic development. GOB has issued its Vision and Policy Statement in February 2000, to bring the entire country under electricity service by the year 2020 in phases, in line with the direction of the Article 16 of 'The Constitution of the People's Republic of Bangladesh,' to remove the disparity in the standards of living between the urban and rural areas through rural electrification and development. The energy prospect is generally assessed on the basis of available commercial sources of energy i.e., fossil fuel- like gas, coal, oil etc. There is a major transition underway in the energy sector worldwide. It is happening due to the following three major reasons:

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(i) A decline in fossil fuel availability, their predicted gradual extinction in the next few decades and the resultant price volatility due to demand-supply gap.

(ii) The need to drastically cut global emissions for mitigating climate change (80% reduction by 2050).

(iii) The need for energy security.

In Bangladesh efficient utilization of renewable energy resources is yet to assume commercial dimensions and hence rational policy dissemination on renewable energy usage is essential. The renewable energy includes solar, wind, biomass, hydro, geothermal, tidal wave etc. Renewable energy in the form of traditional biomass is the main source of primary energy in the country comprising some 35-60% percent of total primary energy use. The size and economic potential of the renewable energy resources (e.g., solar photovoltaic, solar thermal power, wind power, biogas, etc.) in Bangladesh are yet to be determined and the capacity of renewable energy development is presently low. Although investment costs of renewable are generally higher compared to fossil fuel alternatives, this option becomes economically viable when all externalities (e.g. environmental cost, health hazards etc.) and lower operating cost are taken into consideration.

Renewable energy is natural energy which does not have a limited supply. Renewable energy can be used again and again, and will never run out.

Table:1 Summery of Renewable Energy in Bangladesh Technology

Technology	Installed Capacity (approximate estimation)
Solar Photovoltaic	800 kWp / 15,000 SHS
Wind Turbine	20 kW
Wind Pump	6 nos.
Micro Hydro	10 kW
Biogas Plants	10,000 nos.

Source: Mazharul Islam.2012.

Government of Bangladesh has taken a systematic approach towards renewable energy development. In line with the Government approach Bangladesh Power Development Board formed the *Directorate of Renewable Energy and Research & Development* in 2010. Since the very beginning of establishment the directorate is dedicated to keep a sign for the enhancement of Renewable Energy use in power sector. There is a good scope for solar, wind, biomass, micro/mini hydro power generation in Bangladesh. BPDB has taken systematic steps for developing Renewable Energy projects as well as implement and promote Energy Efficiency Measures for the last few years to achieve the target of the Renewable Energy Policy 2008. The directorate is established for feasibility study, planning, evaluation, examination, monitoring of such projects and to perform necessary research based implementation in relative fields. Present manpower of the directorate consists of the director, two deputy director, five assistant engineers and six staffs.

Table: 2 Fertilizer productivity from biogas plant

Fertilizer	Paddy	Wheat	Maze	Cotton
Compost Fertilizer	100	100	100	100
Biogas Residue	110	112.5	128	124.7

Source: BCSIR. 2013

Since the current status of the technology, 4-5 cattle heads are needed for a family size plant, therefore only the well-to-do families of rural areas can be incorporated in biogas programme. Only upper 20% of the rural households own more than four cattle head.

1. Objectives of the Study

The key objectives of the study are:

a. To analyze the present scenario of energy sector in Bangladesh
b. To find out the prospects of renewable energy in Bangladesh
c. To identify the existing power shortage of Bangladesh
d. To provide some policy recommendation for the development of power sector in Bangladesh.

2. Materials and Methods

The study is basically based on secondary sources. The secondary data have been collected from different Government and Non-Government Organization's Annual Reports. Primary Information collected from the officials of DESA, DESCO, PDB, DPDC, DESCO, Ministry of power, Bangladesh energy regulatory commission and Rural Electrification Board. Different books, research articles, journals, relevant research reports, conference papers etc. were also reviewed to pursue the study.

3. Results and Discussions

Time-bound targets for mass dissemination of different renewable energy technology options have to be adopted by the Government of Bangladesh (GOB) for fulfilling its obligation of universal electrification program by the year 2020. GOB should take different Sustainable Energy Technologies (Renewable, Energy Efficiency etc.) very seriously for achieving this ambitious goal GOB should create the much talked about Renewable Energy Development Authority (REDA) immediately to act as a focal point in the renewable energy sector of Bangladesh. REDA should be engaged to remove the barriers prevailing in the RETs sector.

- It should be noted, in the context of access to modern energy sources, the discussion on renewable energy issues cannot be complete without the consideration of several key issues that are becoming central to local, regional and global energy policy arena. For example, while the commercial emission of greenhouse gases such as carbon dioxide is negligible in Bangladesh, from a global perspective, if the trend of widespread usage of solar home systems can be extended in all developing countries including Bangladesh, the emergent global environmental benefit of mitigating greenhouse gases could be quite significant. If such efforts do become reality, this will result in: i) avoidance of fossil fuel use for providing electricity in rural areas; and ii) lowering of solar photovoltaic costs in the global market, stimulating applications in both developed and developing countries that would otherwise have been delayed.
- Additionally, incomplete combustion of biomass fuels from indoor cooking stoves, resulting in indoor air pollution is a direct local environmental externality. While improved cooking stoves are yet to become widely accepted in Bangladesh, research shows that the exposure to solar home systems seem to have acted as a sort of catalyst to the women of solar home system households
- To achieve the very ambitious national vision of providing electricity to all by 2020 Bangladesh will need to achieve an effective power generation capacity of 17000 MW. Taking uncertainties of consistent generation and various losses, nation must provide for an installed capacity of 20,000 MW. The present Generation that is about 4000 MW with installed capacity inclusive of many de-rated plants is about 5000 MW. We have virtually a little over 6 years to achieve the target. If the democracy survives withstanding very intensive conspiracy by vested quarters there will be another term of democratic government. Between now and 2020 in 6 years we have to set up generation facility for 15000 MW.
- The present generation is 90% natural gas based. Coal, Hydro, furnace oil and diesel are other forms of generation. Wind, solar and bio fuels are making negligible contribution. When we consider that in the last seven years from 2001-2008 we managed to add only about 500 MW it is even impossible to dream to achieve the target to supply power for all by 2020. But the nation has to move on and try its level best to achieve as much as practicable.

4. Conclusion and Recommendation

The present report discusses the challenges in the energy sector of Bangladesh and makes a number of recommendations to overcome them. However, the challenges are more than non transparency in decision making, alleged interference by vested interests, scarcity of energy resources, and a lack of funds, technology, processes and institutions, enumerated here.

The recommendations are:

1. A comprehensive, holistic energy strategy should be developed to address the above shortcomings. These policies must be arrived at with a national dialog, free from vested agendas and external interference.

2. While existing institutions and frameworks must be strengthened, new institutions, such as a Center for Energy Excellence, should be set up to coherently arrive at economic, technical and policy options in the energy sector.
3. Policies to support the energy strategy must be based on expert, unbiased economic, geological and engineering assessment and not on speculation or rhetoric. These policies must utilize international best practices and promote greater self-reliance in energy exploration development and utilization.
4. It is recognized that foreign direct investment in the energy sector can infuse needed funds and technology but it must be considered within the context of the comprehensive energy strategy developed.
5. It must support the country's long-term interests, including the goal of greater self reliance in all aspects of energy sector activities. Partnerships with foreign entities must be based on a win-win proposition and only after a careful, transparent and unbiased consideration of proposals from such entities, as well as a careful assessment of their credentials. On specific energy source options, the panel recommends increased exploration for gas, a much greater attention to the rural sector including the use of modem cook stoves and a significant increase in research and utilization of modem renewable energy sources.

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