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Bangladesh Leading The Way In Green Energy

Recently a report by the International Renewable Energy Agency (IRENA) highlighted Bangladesh's successes in creating substantial employment in the renewable energy sector. In the last ten years, Bangladesh, which currently boasts the sixth largest energy related workforce, saw the number of solar powered homes increase from 25,000 to 3.2 million.

150,000 jobs were created as a result of the industry which has grown up in the manufacturing, installation and repair of solar panels and related accessories. The number of solar powered jobs nearly doubled between 2011 and 2013. The report further stated that the numbers are set to increase further due to high installation rates.

The current government has plans to enhance national power generation capacity to 16000 MW by 2016 to meet expected energy demands of that time. The government envisages that at least 800 MW of such power should come from solar sources. To that end, they have embarked on a comprehensive program, which sets out how they plan to make the best possible use of solar energy between the years 2012 and 2016. Works are currently underway on Bangladesh's largest solar power plant at Sulla Upazila of Sunamganj district. This 400 KW capacity plant will supply power to 400 homes and will be built by funding from the Climate Trust Fund and government of Bangladesh.

Consumers benefiting too

It is not only that Bangladesh is taking significant strides in making effective use of renewable energy sources, but the end consumers too, are also being immensely benefited by the move towards green energy. In a survey conducted by the government's Implementation, Monitoring and Evaluation Department (IMED), it was found that about 98.8% of the solar home systems (SHSs) under a project have been able to reduce their expenses significantly than kerosene, candle or torchlight while 89% found SHSs to be more environment and human health friendly.

The current major solar energy projects which the government of Bangladesh is implementing include:

- 8 MWGrid Connected Solar PV Power Plant at Kaptai Hydro Power Station,at Rangamati on turnkey basis;
- 3 MWGrid Connected Solar PV Power Plant at Sharishabari, Jamalpur on IPP basis;
- 30 MWSolar Park Project adjacent to new Dhorola Bridge, Kurigram on IPP basis;
- Solar Street Lighting Projects in seven (7) City Corporations of the country

Public private cooperation – Key to success

Building an effective partnership between the public and private sectors has been one of the principal reasons behind Bangladesh's remarkable success in this emerging field. For instance the Infrastructure Development Company Limited (IDCOL), which was established by the government of Bangladesh as a non-bank financial institution in 1997, has played a

major role in distributing the benefits of solar energy under their Solar Energy Program. IDCOL's target is to finance 6 millions solar home systems (SHSs) by 2016.

Wind not far behind

However, it is not only solar energy where Bangladesh is making its mark. Other forms of renewable energy (such as wind power, biomass based electricity, biogas based electricity, hydropower etc) are also being harnessed to meet the green power generation needs of Bangladesh. Very recently, Bangladesh Power Development Board (BPDB) signed a deal with US DK Energy (BD) Ltd for construction of a 60 MW wind power plant at Cox's Bazar district. Wind mapping are ongoing for the regions of Cox's Bazar, Kutubdia, Khepupara, Feni and Chittagong to better enable us to find the right geographical location to tap into further wind energy.

It is estimated that the country's 740 square kilometer coastal belt can produce as much as 20,000 MW of electricity if the potential of wind can be harnessed by adopting requisite measures. It is believed that the aforementioned wind mapping, once done, will open up the potential that wind holds for power generation in Bangladesh.

The government is also looking at hybrid technology whereby the powers of wind and solar combine to help people obtain electricity. One such ongoing project is a 7.5 MW off Grid wind-solar hybrid system at Hatiya Island, Noakhali.

Biogas- A cost effective green solution

Biogas is a fuel gas, a mixture consisting of 65% methane (CH4) and of 35% CO2. It is a renewable energy resulting from biomass. In Bangladesh, people in rural areas are making use of this cost effective solution to energy needs in their kitchens and fields. Currently, Bangladesh receives 2 MW power from biogas and biomass technologies. For instance, for the last couple of years, people in several rural areas of Gaibandha district have been using biogas for cooking purposes, and the slurry, the main effluent of the biogas plant, as organic fertilizer for boosting agriculture production. it should be noted that the production and use of bio-fuel instead of fossil fuel reduces the emission of greenhouse gas that causes global warming.

Current power generation capacity of renewable energy

Category	Achievement
Solar Home Systems	130 MW
Other Solar PV Applications including Solar Irrigation	5 MW
Wind Energy	2 MW
Biomass based electricity	2 MW
Biogas based electricity	1 MW
Total	140 MW

Governmental support

Here is a brief look at some, but not all, of the principal steps/actions taken by the current government so far to encourage and/or promote the use of power acquired from renewable sources:

Formulation and amendment of Renewable Energy Policy: The government formulated the Renewable Energy Policy in 2009. According to the policy, Bangladesh has set itself the target of achieving 5% of its total energy production from renewable energy sources by 2015 and 10% by 2020.

More recently, the government has taken the initiative to revise the Energy Policy to provide incentives to the renewable energy sectors. The incentives will be provided in two separate schemes for the urban and rural areas.

Incentives for investors: The draft revised policy will also allow waiving of income taxes of foreign and local investors in these sectors for 15 years. Foreign investors will enjoy waiver of taxes on the earnings from technical know-how, technical assistance, royalty, and the tax on the interest on foreign loans. They would also be able to transfer investment, income and profit to other countries. Furthermore, entrepreneurs would be waived from taking licenses from the Bangladesh Energy Regulatory Commission for installation and operation of a renewable power plant with less than 5MW capacity.

Institutional development: Recently, the government established the Sustainable and Renewable Energy Authority (SREDA) under the SREDA Act 2013. This organization will work as the nodal agency and coordinator for all kinds of activities regarding renewable and sustainable energy sources. It will act as a coordination body for the development of renewable energy in the country.

Government agencies and departments like IDCOC, Bangladesh Power Development Board (BPDB), Rural Electrification Board (REB), Local Government Engineering Directorate (LGED) and others are involved in renewable energy development in Bangladesh. Noted Public Universities and their affiliated Institutes are involved in research and development of Renewable Energy Applications.

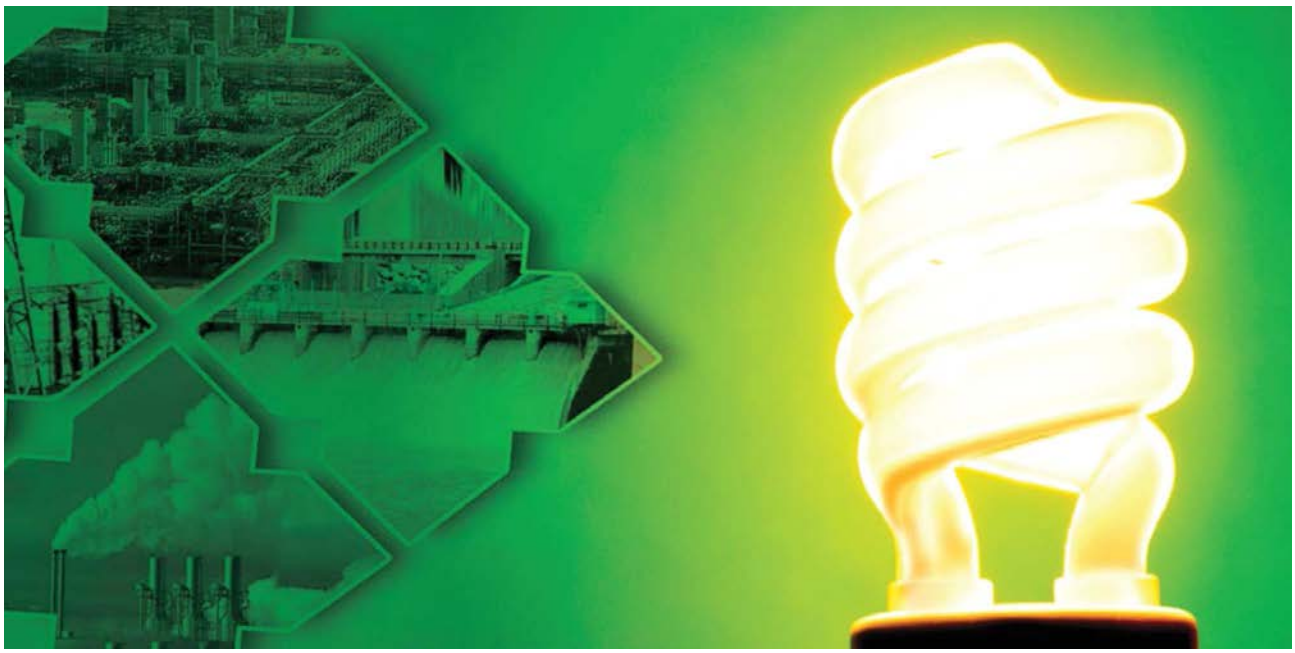
A new wing on Sustainable Energy has been set up under Power Cell, the technical unit of Power Division. The wing comprises of one Director, one Deputy Director and one Assistant Director is extending technical support to Power Division in formulation of relevant program and policy.

Establishment of separate directorates among the public utilities can carry forward research and development of Renewable Energy Technologies. With this purview, independent renewable energy directorates have been set up under BPDB and REB. The directorates are functioning at full extent.

Central bank's assistance: The Bangladesh Bank, has issued various instruments to encourage investment and financing of green energy. They have formulated and issued "Environmental Risk Management Guidelines" and "Policy Guidelines for Green Banking" for all banks and financial institutions which provide instructions to finance solar energy, bio-gas plant, ETP and Hybrid Hoffman Kiln (HHK) in brick making sector under refinance programs. Another dozen plus green energy products are expected to be introduced shortly for encouraging investment in green energy sectors.

Conclusion

Given the policy and institutional supports this emerging sector is getting, the campaign for promoting renewable energy in Bangladesh surely looks as being on track to achieve the expected targets within a very short time. To know more about Bangladesh government's current activities and future plans on renewable energy please visit the websites of Bangladesh Power Division (www.powerdivision.gov.bd) and Power Cell (www.powercell.gov.bd).



Powering Bangladesh's Future: Story of Electricity

During the Awami League led grand coalition government's last tenure (from 2009 to 2013), all pledges made in the 2009 election manifesto were successfully implemented. In 2009, the power generation capacity of Bangladesh was 4931 MW. Within 5 years, the power generation capacity stood at 10681 MW with around 68% of the population having access to electricity. This spectacular success was achieved through immediate, short term, mid-term, long term and emergency measures adopted as part of the government's overall power and energy policies.

In the 2009 manifesto, Awami League pledged to increase electricity generation capacity in the country to 5000 MW by the year 2011 and 7000 MW by 2013. As the statistics clearly show, the government has been successful in meeting these targets and has even been able to achieve higher level of precedents. In this report, we look at the government's overall power generation policies and activities.

Power System Master Plan

Right after assuming office in 2009, in order to address the debilitating power shortages plaguing Bangladesh from 2001 onwards, the Awami League led government formulated the forward looking Power System Master Plan 2010 (PSMP-2010). This signified an improvement from the earlier PSMP formulated in 2005 which was based mainly on gas powered power plants. Due to uncertainty regarding the country's gas reserves, the earlier plan turned out to be inadequate.

The PSMP 2010 envisages coal as the dominant primary fuel for the attainment of stable power supply up to the year 2030 in consideration of the diversification of fuel resources. The PSMP 2010 was developed with the technical assistance of Japan International Cooperation Agency (JICA) and was approved by the government after a thorough sector experts' review and stakeholders' consultations.

According to the Plan, in 2030 the demand of power would be around 34,000 MW while the generation capacity would be about 39,000 MW. The 39,000 MW power by 2030 would be generated in the following proportions from various sources: domestic coal based plants (11,250 MW), imported coal power plants (8,400 MW), domestic gas fired power plants (8,850 MW), nuclear power plants (4,000 MW), regional grid (3,500 MW), and oil, hydro and renewable energy sources combined (2,700 MW).

"Vision 2030: Long Term Power Development Strategy for Bangladesh"

In order to achieve this desired level of power generation, the PSMP 2010 contains the holistic "Vision 2030: Long Term Power Development Strategy for Bangladesh" which envisages delivering stable and high quality electricity to the people of Bangladesh via the creation of a power network that will help realize comfortable and affluent lifestyles for all. In order to realize this vision, the government has targeted:

- To actively develop domestic primary energy resources: The target in this regard is to maintain domestic primary energy supply over 50% and developing domestic natural gas and coal.

- To establish power system portfolio by fuel diversification: The target has been set to achieve the following fuel consumption ratio for 2030: Coal (50%); natural gas (25%); and others (25%). The following also will farther this aim: construction of coal power stations; introduction of liquefied natural gas (LNG) facilities; construction of oil fired power stations; importingelectricity generated by hydro power from neighbouring countries or joint development; development of domestic renewable energy (wind and solar).
- To realize a low carbon society by introducing high efficient power supply and low CO2 emission technology: The target is to improve 10 points thermal efficiency on average; developing highly efficient gas power stations; development of domestic coal power stations; reviewing O&M scheme; energy conservation and demand side management.
- To build an infrastructure necessary for stable power supply under joint coordinating by multiple sectors: This includes the target to jointly build a deep sea port facility by power, industry and commercial sector; improving the power transmission system; enhancing gas transmission lines; construction of fuel center; strengthening domestic waterway and railway systems.
- To build an efficient and effective mechanism, organizations and regulations for stable power supply: This targets establishing an organization for long term stable fuel supply security; formulating regulations for compulsory regular inspection of power stations by leadership of government; revising the tariff structure to recover maintenance costs and future investment for plants and equipments.

Manifesto 2014

Keeping in line with PSMP 2010, in their Election Manifesto for the 10th National Parliamentary Elections held on January 5, 2014, Awami League made a number of further commitments regarding the power sector of Bangladesh. The manifesto envisages electricity in every household of Bangladesh in the next five years. The target has been set to achieve 16000 MW power by 2016, and 20,000 MW power by 2021. Subsequently, the target was revised to 24,000 MW by 2021 in light of industrialization, increased demand for electricity and enhanced power generation capacity.

The manifesto further pledges:

- Taking initiatives for implementing the proposal for power-generation-sharing through bilateral, trilateral and sub-regional cooperation with neighbouring countries such as India, Nepal and Bhutan;
- Use of solar energy to be made easily available and extensive through the installation of 3 million solar panels;
- Constructing Rampal and Rooppur power plants within scheduled time;
- Ensuring proper economic use of coal resources and increasing share of coal based power generation to 50% by 2030;
- Reducing electricity waste by increasing efficiency in management;
- Importing LNG from abroad
- Establishing LNG terminal in Maheshkhali island.

Budget 2014-15

In his budget speech, the Honorable Finance Minister outlined the current government's plans regarding power sector to be achieved by 2017:

- To take initiatives, apart from increasing domestic production, to generate and allocate power through bilateral, trilateral and sub-regional agreements with neighboring India, Bhutan and Nepal;
- To raise generation capacity to 18,000 MW of electricity by 2017;
- To establish coal based power plants with a generation capacity of 1500 MW by 2019 which will shift the burden from gas which, at present, contributes to 78 percent of power generation in the country
- To establish two nuclear power plants at Rooppur with a total generation capacity of 2000 MW of electricity

Recent Developments

The government has already started implementing the following pledges made in the 2014 election manifesto of Awami League:

Power import from neighbours: Bangladesh is currently importing 500 MW of power from India. The power from India began to flow in Oct last year when the Baharampur-Bheramara cross-border power transmission link got connected. Presently, a joint feasibility study is being conducted by the two countries to facilitate Bangladesh's import of a further 100 MW electricity from gas-fired Palatana power plant in India's Tripura state. The import of 500 MW from India is saving Bangladesh TK 40 billion a year. Discussion is going on to import another 500 MW through Bheramara-Baharampur intersection.

Bhutan has numerous prospects for hydroelectricity power generation and to that end Bangladesh's State Minister for Foreign Affairs recently met with the

Bhutanese ambassador to express Bangladesh's interest in importing their surplus electricity. Bangladesh is eyeing Nepal as a potential source for power import. Bangladesh has submitted official proposals to Nepal for importing 500 MW of electricity from Nepal's Upper Karnali Hydroelectric Project and 600 MW from Upper Marsyangdi-2. Gail Energy, the developer of the project is keen to supply the power to Bangladesh.

Solar and wind power: Bangladesh has embarked on a comprehensive programme to boost power generated from the sun's energy between 2012 and 2016. Works are currently underway to build a 400 KW capacity plant at Sulla Upazila of Sunamganj district. Also under construction is a 30 MW PV power plant at Dhorola River Side, Kurigram, Bangladesh. Recently, the government has announced plans to build the country's largest single solar energy project, 60 MW solar park, at Raozan Upazila of Chittagong.

Bangladesh has also achieved the fastest growth rate for installing solar home systems (SHS) in the world, 70,000 systems every month. 3.2 million systems have already been installed with support from development partners. Owing to the success of the programme, Bangladesh received an additional $78.4 million from the World Bank as soft loan. Bangladesh has undertaken 500MW solar system which includes solar park, solar mini-grid, solar irrigator, solar roof top.

Moving ahead with solar with a landmark success in Solar Home System, Bangladesh is exploring its wind power potential as well Wind mapping is going on in various probable potential sites

Very recently, Bangladesh signed a deal for building the country's largest ever wind power plant, of 60 MW generation capacity, at Cox's Bazar with US DK Green Energy (BD) Ltd, a joint venture between Bangladesh, Denmark and USA.

Coal fired power plants: Bangladesh is going to build its first coal fired power plant at Matabari, Cox's Bazar. The 1200 MW power plant will be built using ultra super critical technology and funding from both the Bangladesh government and Japan International Cooperation Agency (JICA). The project will be built by Coal Power Generation Company Bangladesh Limited (CPGCBL), a government enterprise, at a cost of more than TK 400 billion.

Bangladesh is going to start work on a 1,320 MW coal fired power plant, "Maitree Super Thermal Power Project" at Rampal, Bagerhat from next year. The project is being built as a joint venture between India and Bangladesh at a cost of TK 145.84 billion. A company named Bangladesh-India Friendship Power Company has been set up to build this project using "ultra super critical technology".

Bangladesh has recently signed a memorandum of understanding (MoU) with China Huadian Hong Kong Co. Ltd, a subsidiary of China Huadian Corporation, for setting up a coal-fired power plant of 1,320-MW capacity at Maheshkhali island in the southeastern coast of the country under a joint venture agreement. BPDB and China Huadian will set up a joint venture company soon for implementing the project by 2019.

Nuclear power: Bangladesh has initiated the process to have two nuclear power plants, each of 1000 MW generation capacity, at Rooppur, Pabna with the technical assistance of Russia. The two plants are expected to supply 2000 MW power to the national grid by the year 2020. Additionally, Bangladesh has started discussions with Japan for their assistance in building the country's second nuclear power plant in the country's southern region.

Liquefied natural gas (LNG): The government has set in motion the process to build two liquefied natural gas (LNG) terminals for importing LNG from other countries to fulfill its energy needs for power generation, as envisaged in the PSMP. On June 26, Bangladesh signed a preliminary agreement with US Astra Oil and Excelerate Energy to build the country's first offshore LNG terminal at Moheshkhali island in Cox's Bazar. Another terminal would be built onshore for which fifteen companies have already submitted expression of interest (EoI) to the Ministry of Power.

Looking Towards Future

The Awami League led government was successful in fulfilling all of its pledges for the power sector in its last tenure. If past performance is an indicator, then it can safely be hoped that the current government will achieve its future targets too, for the power sector within the stipulated timeframe, if not earlier. The day does not look far away when Bangladeshis will look back at power outages as a thing of the past.

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