Renewable electricity bangladesh

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In the case of Bangladesh, the principal barriers with biomass are; the price is high and collecting large quantities is difficult, hence expensive. Wind has always been a problematic resource to evaluate in the context of Bangladesh. A group of experts believe that the wind potential in Bangladesh, especially onshore, is limited. The offshore potential is unknown, even though one does hear of unsubstantiated claims of huge potential. In financial terms, it is difficult to comment on this in the absence of comprehensive environmental and technical investment grade studies on offshore wind potential.

Solar energy is the single most dependable RE resource that can be resourced on a large scale. This expectation is turning out to be true with local and foreign investments occurring in grid-tied utility scale solar parks and industrial rooftop projects. According to the Chairman of SREDA, more than 1,000 MW of utility scale solar parks and 500 MW of commercial/industrial rooftop solar PV projects under the net metering scheme are on the horizon.

Agricultural land and solar projectsThe single biggest barrier to the large-scale deployment of solar PV electricity is the acute shortage of land. The problem is more connected with the policy--total ban on use of agricultural land for solar projects--than land availability. In Bangladesh, land is very fragmented, and it is very difficult to find contiguous land to construct even a 50 MW solar park without encroaching onto agricultural land. Thus, instead of a total ban, a policy could be formulated that permits a certain amount of agricultural land; say 25 percent of the land of a single solar park, to a maximum of 200 acres per project.

The use of only one percent of the total agricultural land of Bangladesh can facilitate the construction of approximately 50,000 MW of solar power plants. Using the average capacity factor of 4.5 hours per day for Bangladesh, the electricity output from the one percent agricultural land is approximately 82,000 GWh, which is more than the total consumption in the year 2020. If the cost of fuel saved is compared with the output of even three-cropped land, the financial benefits will be more than five times. The lost agricultural output of the one percent land can be easily made up by preventing spoilage that occurs due to the lack of cold storages and other processing facilities.

Optimal dual usage of land and Floating Solar Farms ("floatovoltaics")Since land is very expensive in Bangladesh, dual use of land can make many solar projects viable. There are over 2.83 million hectares of low-lying land in Bangladesh (roughly 20 percent of the total area of the country). Using such low-lying land combined with fisheries is one such innovative solution. A 50 MW solar-fisheries project has been approved and project implementation is underway.

"Floatovoltaics" are photovoltaic (PV) solar power systems designed for floating on reservoirs, lakes, rivers, and other water bodies. Floating solar farms can generate huge amounts of electricity without using valuable land. Bangladesh, being a riverine country, is ideal for floatovoltaics deployment. A comprehensive study and

pilot projects are required to harness this potential. Numerous lakes and reservoirs are under the jurisdiction of WASA can be developed as private-public joint venture projects.

There are many other innovative solar technologies being researched and commercially developed. One very promising technology for Bangladesh is "Agrivoltaics", where crops can be grown beneath the solar panels. A standard conventional solar panel is largely opaque to sunlight. Therefore, underneath the PV panels most crops will not grow. Panels require only a small portion of the solar bandwidth; therefore, technologies are being developed that can filter this for electricity production and pass through the infrared and ultraviolet rays needed by plants, i.e., a translucent/transparent solar panel. If this technology achieves full commercial application, the land constraint that Bangladesh is facing will be removed.

Electricity transmission network

Despite the fact that Bangladesh is a small country in terms of area; electricity grid coverage is very poor. Inexpensive land is invariably located far from the existing electricity infrastructure. The Bangladesh government needs to undertake a massive grid modernisation initiative. The carrying capacity of the national network of transmission lines needs to be made smart and expanded throughout the country. Being geographically small, no matter where the solar plant is located the grid should be able to deliver power anywhere in the country with minimal losses. With a smart, integrated transmission network connected regionally, the intermittent nature of renewable energy can be made more reliable and robust.

Solar combined with Battery Energy Storage System (BESS)Solar PV electricity is already the cheapest source of electricity in many places, but it is only available when the sun is shining. To make solar PV electricity available at other times and make it a source that can truly replace fossil fuels, one has to store the electricity for later use. At the present time, the most promising technology is battery. BESS is one of several technology options that can enhance power system flexibility, reliability, and enable high levels of renewable energy integration. Due to technological innovations and improved manufacturing capacity, lithium-ion chemistries have experienced a steep price decline of over 70 percent from 2010-2016, and prices are projected to decline further.

Technological advancements and cost reduction

Fraunhofer Institute for Solar Energy Systems ISE has presented the newest edition of their study on the levelized cost of electricity (LCOE) of renewable power plants as shown. Even though the information contained is applicable for Germany, where wind and solar are very cheap and coal is expensive because of a carbon tax, it nevertheless provides good indications of how renewables especially solar PV is gaining in cost advantage against conventional fuel-based electricity.

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