

Alternative Energy in West Bengal

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West Bengal Renewable Energy Development Agency (WBREDA), formed in 1993, aims to promote renewable energy technologies and create an environment, suitable for the commercialization of these alternative energy through various innovative projects. The WBREDA is the State Nodal Agency for implementation of non-conventional energy programmes in West Bengal. WBREDA has implemented many programmes related to solar energy, wind energy, mini and micro hydel, bio-energy, etc. WBREDA has a group of experts in the field of renewable sources of energy, who are responsible for formulation, design and proper implementation of the projects related to renewable energy sources.

IMI Konnect: *West Bengal has an alternative energy policy since 2012 in place. What is the main focus – wind, solar, tidal, biomass or waste?*

SB: WBREDA is the State Nodal Agency (SNA) for West Bengal and is responsible to promote all facets of alternative energy in the state of West Bengal. As of now, I would reckon that our main focus is on solar energy. The Government of India has fixed a target to install 175 GW of Grid connected Renewable Energy by 2022. Out of this, 100 GW is earmarked for Solar PV. Further, as per the National Energy Policy, 2018, the Government has aimed for solar power at 275 GW by 2027. West Bengal, like other states, has to adhere to the national Renewable Power Obligation (RPO) which itself is skewed towards solar in its target for West Bengal. So evidently, solar energy is at the focal point of the renewable energy space both at the national and at the state level.

In addition to solar energy, we are working with wind energy too. There is a 2 MW wind farm project of WBREDA at Frasersganj. WBREDA is formulating a programme for its capacity enhancement and replication of a similar type of project at Mousuni Island and at Gangasagar Island. The activities at tidal, biomass and waste to energy space are also gathering pace with the emergence of new technology ideas and are becoming more interesting.

IMI Konnect: *What are the challenges of using alternative energy in West Bengal? Do you think use of alternative energy is going to change the energy scenario in our state in the next 15-20 years?*

SB: West Bengal has traditionally been a coal rich and power surplus state. Thermal power has been the mainstay of its energy portfolio since inception. In such a position, the aggressive penetration of renewable energy

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and its integration poses several challenges in terms of grid integration, load balancing, managing kinks in peak-trough demand curve as alternative sources of energy are mainly intermittent in nature – diurnal for solar and seasonal for wind/tidal.

However, with rapid progress of battery storage technologies, these supply side problems would progressively cease to be deterrent for long. Further, emergence of cost cutting techniques in flue gas effluents for environmental concerns and flexibility in operations of thermal power plants in the quest for clean coal technologies, may pose a challenge to use of alternative energy.

In West Bengal, insolation¹ index is not as high as in the western parts of the country; resulting in relative inefficiencies – leading to possibilities of import of renewable energy from more solar efficient states. Wind and tidal energy potential is also limited by geography. Again, since willingness and ability to pay more for clean energy is limited for now in our state, price elasticity of demand is high in the energy space. Renewable energy combined with battery storage has to be price competitive to thermal energy to meet the challenge comprehensively. In effect, if we are to see a significant shift in energy mix scenario in favour of alternative energy in the coming decade or two; technologies to harness alternative sources have to evolve at cost competitive rates backed by effective storage to address demand side management issues.

IMI Konnect: *Please highlight the successful projects of WBREDA in the recent past.*

SB: The recently completed successful projects of WBREDA are installation of Rooftop Photovoltaic Power Plants at remotely located rural health centres in Sundarbans with battery; efforts are on for the installation of Rooftop Grid Connected PV Power Plants at 1000 schools across the state of cumulative capacity 10 MW which is near completion- installation at further 900 schools and 100 colleges is currently underway as the first project was extremely well-received by the schools; installation of similar power plants at different Government buildings under Alohree programme of cumulative capacity 2 MW where several iconic buildings have been covered under this, like St. Xavier's and Lady Brabourne College, Jadavpur and Burdwan University, several District Courts, Judicial Academy, Police Training School at Barrackpore, several District Correctional Homes etc; installation of several Solar Trees in areas where free land is scarce; installation of Solar Water Heating System at student hostels of Backward Class Department, Government of West Bengal.

IMI Konnect: *Please elaborate on the installation of Grid Connected Roof Top Solar PV System in 1000 schools in West Bengal.*

SB: WBREDA had started installing PV Power Plants at schools from 2010. Back then, it was at schools where grid electricity was

¹Insolation means the solar radiation that reaches the earth's surface.

either absent or not dependable. 100 schools were taken up for Solar rooftop modules in off-grid mode with battery backup. The objective of this programme was to provide solar power for daily fixed hours at those schools.

As grid power slowly reached different remote areas like Sagar Island, Gosaba, Hingaljanj etc between 2012-15, WBREDA started its second stage program with 200 schools in grid connected mode during 2014-15. The objective of this programme was to reduce the electricity bill of schools in Net Metering² mode by pushing excess (excess after the own consumption of the school) solar power to the grid and reducing both the quantity of conventional electricity consumption and lowering the tariff bracket of the schools.

During 2017-2018, during its expansion drive, WBREDA has taken up another 1000 school programme where such power plants have been installed (each 10 KW capacity) at the rooftops of 1000 Government aided schools across the state. The project is now nearing completion. It is expected that each school can save on an average 12000 units of electricity annually, worth ₹72,000. Inspired by its successful and excellent feedback from school authorities and local representatives, WBREDA has taken up its 1000 schools Phase II (900 schools and 100 colleges) in 2019-2020 and is being rolled out now with field level inspections being underway.

IMI Konnect: *What are the benefits of setting up of grid connected rooftop solar PV (GRTSPV) systems at the customers' premises under residential/institutional/social sector?*

SB: WBREDA installs Rooftop Solar PV Power Plant in net metering mode with no storage arrangements as of now. For such installation, three phase power supply from the concerned Distribution Company (WBSEDCL/CESC) is required at consumer premises with appropriate voltage level. For such a plant, minimum capacity of Solar Photovoltaic (SPV) installation requirement now is 5 kWp. For installation of each kWp of Solar PV Power Plant, effectively 10-12 sqm shadow free (roof) space is required.

With such a system, generated excess solar power goes to the grid of the DISCOM (Distribution Company/electricity provider like CESC/WBSEDCL) at the day time. With this system, the user will use the grid quality electricity from the distribution company and the generated solar power from its solar power plant. The user will pay the adjustment amount of electricity bill (consumption of electricity from the grid minus the excess solar power as it is pushed to the grid) to the CESC or WBSEDCL. So, this is a solar system which reduces the electricity bill of the consumer, through reduction of tariff slab and reduction of quantum of electricity.

²Net Metering is a billing mechanism that credits solar energy system owners for the electricity they add to the grid.

IMI Konnect: *What is your opinion on energy efficiency in West Bengal compared to other states?*

SB: The West Bengal State Electricity Distribution Company Ltd (WBSEDCL) is the State Designated Agency (SDA) for energy efficiency and energy conservation programs in West Bengal. The Department of Power and Non-conventional energy sources, Government of West Bengal is presently preparing an Energy Action Plan for the state through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the position will be clearer after the report is submitted. However, West Bengal remains amongst the best states in India in terms of energy efficiency and overall performance of its power utilities both functionally and financially. Several big impact investment intensive initiatives have been undertaken by WBSEDCL to increase efficiency like strong demand side management, enforcement of energy conservation building codes (ECBC) and wide spread dissemination of LED devices.

IMI Konnect: *Are you planning for any foreign collaboration, if needed?*

SB: WBREDA is in the process of implementing activities like capacity building of installers, development of vendors, awareness generation among potential buyers in the industry and commerce sector and single window clearance for grid connectivity by net metering etc through a European

Union (EU) programme. WBREDA is keen on implementing MW scale floating solar projects for which technology tie-up and funding may be sought from German KfW Bank.

IMI Konnect: *What is the future potential for the renewable energy sector in West Bengal?*

SB: The Renewable Energy Policy for West Bengal, 2012 has outlined the future projections for us in this regard. For the currently proven renewable technologies in the state, the future potential till the end of 13th Five Year Plan (2022) is a total of 2206 MW. Out of this total, wind power, mini and small hydro, cogeneration, biomass, waste to energy attained a fulfilment of 16.67 per cent, 55.83 per cent, 59.16 per cent, 36.25 per cent, 50 per cent respectively till the end of 12th Five Year Plan. However, at the end of the 13th Five Year Plan (2022), it is expected that the total cumulative capacity of solar energy will be 500 MW.

IMI Konnect: *WBREDA is operating few electric vehicles for last couple of years. What are future plans and growth possibilities in this sector?*

SB: WBREDA had done it as a pioneering Technology Demonstration Program with the help of the MNRE, Government of India. Recently, Government of India has announced the Electric Mobility mission, which envisages from 2030, no new vehicle without electrical charging system will be on road in India. Initiatives in this sector are now

being looked after by the transport department, Government of West Bengal. The Power Distribution companies (WBSEDCL/CESC) have been presently mandated to set up Electric Vehicle (EV) charging stations evenly throughout the State before the EVs are rolled out in large numbers. Other relevant factors would be affordable pricing, increased mileage per charge and attractive models of the EVs for higher customer satisfaction.

IMI Konnect: *WBREDA has undertaken the Rabi Rashmi Project, first of its kind in India. Which section of people is this meant for?*

SB: It is a pilot project to showcase integrated and wholesome application of solar energy in the residential sector. The standalone bungalow buildings have Rooftop Solar PV Power plant, Building Integrated Photovoltaic (BIPV), Solar Water Heating System and Solar Passive Cooling arrangements to name a few. It was a much vaunted successful venture and the housing units were immediately sold on offer to progressive minded customers as an environment friendly option and life style statement.

IMI Konnect: *Please share your thoughts on the Municipal Solid Waste to Energy project. How much have we progressed in this?*

SB: This sector is presently being driven by the initiatives of the Municipal Affairs Department, Government of West Bengal. The main challenge here is to organize and

educate the society about the necessity and benefits of waste segregation, being able to effectively collect the waste through organized municipal teams by providing suitable tipping fees and delivering the waste timely to the enabled power plant for due conversion to energy. Several projects have been formulated under this Municipal Solid Waste to Energy conversion concept with 1-2 MW capacity power plants. Quality standard of the waste and the cost of generation in comparison to coal power are the two main issues that needs to be monitored to make further progress in this field.

IMI Konnect: *Do you think that there is a rise in the interest/awareness of common people towards alternative energy usage?*

SB: Yes, the perception level of the common people has certainly improved in last ten years significantly, due to sizable reduction in the price of solar PV rooftop equipments, solar agriculture pumps and increased visibility of such systems in almost all cities, towns and blocks in West Bengal. The school rooftop solar project has acted as an outreach program in the rural areas. Media attention towards electric vehicles is significant now. There is widespread global concern on environmental issues and copious literature and extensive debate on use of alternative energy which all of us are aware of.

IMI Konnect: *Apart from household or schools, do you have any programme targeted to a specific industrial sector?*

SB: Yes, WBREDA had played a pivotal role in making fishermen aware about using PV system with battery backup for lighting, mobile charging, operating radio etc at fishing trawlers when these are in operation at deep sea. Such programs were organized by WBREDA at Digha and adjoining coastal areas in 2011 and is now institutionalized and executed by the concerned district administration and Disaster Management Department, Government of West Bengal.

IMI Konnect: *Government of India has launched a programme styled as Special Area Demonstration Programme (SADP). WBREDA has already undertaken certain initiatives for implementation of the same. How far have it progressed?*

SB: Under SADP, WBREDA has installed Solar PV Home Lighting system with LED lighting fixtures in hundreds of tribal households in three districts of West Bengal - Bankura, Purulia and West Midnapur.

IMI Konnect: *How is the future ahead for development of the renewable energy sector in West Bengal?*

SB: WBREDA has undertaken several projects which are being implemented. Apart from installing solar power plants in different parts of the state, the future agenda also includes encouraging and implementing tidal, biomass and waste to energy projects in a viable manner with concerned departments. Also, the long run objective is to assist in expansion of electric vehicles, promote all

facets of renewable energy and coordinate between Central and State policies and execution as state nodal agency.