



MR SAMUJJAL GANGULY
VICE PRESIDENT PROJECTS,
VIKRAM SOLAR

Renewable Energy and Floating Solar Power Plants

One of the biggest challenges before India today is the power crisis. According to World Bank data, more than 300 million Indians have no access to regular electricity. In 2012-13, India's power sector could supply just 124,000 megawatts for a country of more than 1.2 billion people. By contrast, Britain generated a maximum of 55,000 megawatts for a country of just 60 million. Even for those who have access to electricity in India, the supply is not regular. Blackouts and load-shedding interrupts irrigation and manufacturing across the country. States like Bihar, where only agriculture is the source of revenue for a majority of its population, bears most of the brunt.

Electricity crisis is one of the major reasons behind the backwardness of Bihar. Industries are not willing to set up shop there because of lack of power to run plants. Bihar doesn't have enough coal to run thermal power plants. Thermal power plants account for over 65 per cent of India's generated electricity and India's electricity sector consumes about 80 per cent of the coal produced in the country. It is high time India moves away from coal-intensive electricity production and explores renewable energy resources like solar energy.

With India being the seventh largest country in terms of area and gifted with fairly well sunshine for almost 300 days in a year, solar power has lots of potential in store for us.

Because of high initial cost, need for space to install the panels and limited electricity production has handicapped the people from using it at home. Small solar systems of Rs. 45,000 can run only three lights, a couple of fans and a TV.

Even commercial electricity production using solar energy (as percentage of total electricity produced) stands in single digits. However, the Central Government has big plans for this sector.

While presenting the Union Budget for 2014, Finance Minister Arun Jaitley said, "New and renewable energy deserves a very high priority. It is proposed to take up ultra-mega solar power projects in Rajasthan, Gujarat, Tamil Nadu, and Ladakh in Jammu & Kashmir. I have set aside a sum of Rs. 500 crore for this." He said the Government is also planning to launch a \$74 million scheme for solar power-driven agricultural water pumping stations for 100,000 pumps and to spend a further \$18.5 million on developing 1 MW Solar Parks on canal banks.

The International Scenario

Transferring our focus to a completely different geography, in Queensland, Australia, at times, the price of electricity becomes negative (producers pay people to use their output) because of the newest, biggest power source in the State – rooftop solar. In South-East Queensland, more than 2, 50,000 homes have solar installations which amount to 11 per cent of total residential power consumption in the area.

As per a Guardian story, "negative pricing" usually occurs at night, when most of the population is asleep and demand is down. Operators of coal fired genera-

tors are reluctant to switch off. So they pay others to pick up their output.

Floating Solar Power and India

A floating solar power station would prove to be a revolutionary step as it could solve the perennial problem of land. Such pilot projects are also going on in a few countries such as France and Australia.

Studies have also shown that if the rear surfaces of solar panels are kept cooler, then their ability to generate power goes up by 16%. As these solar panels would be floating on water, they are expected to stay cool and hence we can generate more power than those set up on land.

As even the best is not perfect, currently, land earmarked for solar development in India is rapidly increasing in value with prices jumping around 10 to 20 per cent. By building out capacity over water, Government and energy company developers can save both cash and valuable real estate. India is planning to install a 50 megawatt solar power plant on a 1.27 million square metre floating platform by the end of the year, according to Science Alert.

The floating solar power technology was developed by India's Renewable Energy College. The chairman of the Renewable

Energy College SP Gon Choudhury had this to say on this initiative “The ecology of the water body is not likely to be affected much and it will also reduce evaporation, thus helping preserve water levels during extreme summer. Solar panels installed on land face reduction of yield as the ground heats up. When such panels are installed on a floating platform, the heating problem is solved to a great extent.”

The panels will be installed on floating platforms that are anchored tightly so that they do not move too much if the weather gets bad. By being on top of the water the solar panels will be able to cool themselves more efficiently than if they were on land. This means that they will last longer, produce more energy, and help prevent evaporation in hot summers. India has already started to build 10 megawatt solar plants on top of several canals, and is planning to build a solar power station on large stretches of water in Kerala.

The Potential of the Floating Solar Power in India

India is currently making plans to build the world’s largest floating solar power plant. The plant is expected to produce 50 megawatts. A single megawatt from a conventional generator, like a coal plant, can theoretically power 400-900 homes. From a solar plant a single MW can be expected to power around 160 homes on average. This number can rise or shrink depending on factors like amount of sunlight it collects, how much energy the homes use, and the weather.

Even so, if the average holds then this plant can be expected to power over 8000 homes. The plan to build this massive floating power plant follows after the plans for a canal-top solar panel project. The project plans to build cover canals with solar panels that can get about 10 MW in the Indian state of Gujarat. This major project is expected to cost between 64-72 million dollars. It will be set up in bodies of water in the Southern state of Kerala by the National Hydro Power Corporation with assistance from Renewable Energy College.

The Future of Floating Solar Power Plants

Although, a floating solar power plant is good news and opens new avenues for



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the solar power sector, it is not as if we can cover the ocean with solar panels. Hence, for a vast country like India, solar power plants need to be developed on land, water bodies and on rooftops. With more solar power plants, there will be less dependence on coal and electricity production will not harm the environment. Every household/state will have power in the future despite unavailability of coal. Electricity will be cheaper which will eventually support a very robust economy.

The picture is also not all rosy and is rife with a lot of challenges. They include system problems arising due to high moisture content, corrosion as a result of adverse environmental conditions as well as stability in times of inclement weather. Besides, there are also challenges in safely transporting the power from the floating objects.

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Plenty of solar power projects were commissioned by the previous Government in last couple of years. However, only a few are operational. The new Government has prioritised the solar power sector in its Budget, but the implementation should be done on war footing.

Solar energy will only then prove to be the goose that lays the golden eggs ◀◀