RESOURCE RICH
OCTOBER 2014
RENEWABLE WATCH

STATE FOCUS

Resource Rich

Maharashtra aims to tap its vast renewable energy potential

By Meera Bhalla

Maharashtra, one of the largest states in the country, has the highest installed power generation capacity of more than 35 GW as of August 2014. However, with rapid industrialisation, the power demand-supply gap in the state is rising, leading to frequent incidences of load shedding in many areas. In August 2014, peak power demand reached 17,624 MW, as against availability of about 16,938 MW, leading to a power deficit of 3.9 per cent.

During 2013-14, the power deficit in the state stood at about 8.6 per cent. This is likely to increase, given the recent Supreme Court stay order on a ruling by the appellate authority allowing power generators to seek increased power tariffs to compensate for the high cost of imported coal. This has affected about 3,000 MW of power generation in the state, the majority of which is produced by Adani Power (2,000 MW), Tata Power (400 MW) and Indiabulls (150 MW). According to industry experts, power demand in the state is expected to rise further, which will put additional pressure on the power network. In this scenario, the state's huge renewable energy potential can help ensure reliable power supply.

With about 10 per cent of India's total renewable energy potential, Maharashtra occupies fifth position in the country. The state has the fifth highest potential in terms of wind energy and the second highest biomass potential. This has helped it attract private investments, which augmented the total installed renewable energy capacity to 5.6 GW, the second highest in the country, as of August 2014. Almost all the renewable energy resources have reached grid parity in the state, for both commercial and industrial consumers, owing to the high grid power tariffs for these users. At present, industrial consumers are paying Rs 7.45 per unit, whereas the net levellised tariff for solar (the most expensive renewable energy source in the state) has been set at Rs 6.63 per kWh for power from utility-scale solar photovoltaic (PV) projects and Rs 7.29 per kWh from solar rooftop projects, as per the recent tariff order of the Maharashtra Electricity Regulatory Commission (MERC). According to Arul Shanmugasundram, executive vice-president, projects, and chief technology officer, Tata Power Solar, "Due to the high industrial and commercial tariffs, the viability of solar projects, even without subsidies is quite high in Maharashtra."

The state has also set an ambitious annual renewable purchase obligation (RPO) target of 9 per cent for the period 2013-14 to 2015-16, including 0.5 per cent annual solar purchase obligation (SPO) targets. The distribution licensees have also been mandated to meet 0.1 per cent of their annual non-solar RPO for the period 2010-11 to 2012-13 and up to 0.2 per cent of their non-solar RPO obligation for the period 2013-14 to 2015-16 through power purchase from mini- or micro-hydro projects.

The performance of Maharashtra State Electricity Distribution Company Limited (MSEDCL) in meeting its non-solar RPO targets during 2010-11 and 2012-13 was satisfactory, with a compliance rate of 98 per cent. However, for its solar RPO, the compliance level was only 6 per cent. In August 2013, the commission declared that all distribution firms were to meet their RPO targets for the past four years (2010-11 to 2013-14) by March 2014, or face a heavy penalty. This has been the strongest decision taken regarding RPOs by any state or central authority since the guidelines were issued. The MERC announced the setting up of a committee for the timely collection and review of data regarding the compliance level of various entities in the state. A panel under the committee is liable to maintain a record of all open access consumers and captive users, and the trading of their renewable energy certificates (RECs). However, in its March 2014 decision, the commission

RPO carry-forward as per MERC's March 2014 order

	2010-11		2011-12		2012-13		2010-13
	Carry-forward (%)	Carry-forward (MUs)	Carry-forward (%)	Carry-forward (MUs)	Carry-forward (%)	Carry-forward (MUs)	Cumulative shortfall (MUs)
Solar RPO target	0.25	213.39	0.25	237.42	0.25	233.16	683.97
Solar RPO met	0.00	1.13	0.01	10.89	0.03	27.74	39.76
Solar RPO to be carried forward	0.25	212.26	0.24	226.53	0.22	205.42	644.22
Non-solar RPO target	5.75	4,908.05	6.75	6410.30	7.75	7,228.00	18,546.35
Non-solar RPO met	5.77	4,926.42	7.14	6,778.45	7.02	6,542.26	18,247.98
Non-solar RPO to be carried forward	(0.02)	(18.37)	(0.39)	(368.15)	0.73	684.89	298.37

Source: MERC

allowed MSEDCL to carry forward its RPO compliance shortfall for the period 2010-11 to 2012 without imposing any penalty.

This ambiguity regarding the decisions of the state regulators on enforcement of the RPO mechanism is affecting the REC market, which has crashed due to the dearth of buyers. As of October 13, 2014, the number of unsold RECs stood at 10,234,746. With about 999 MW, Maharashtra has the second highest capacity registered under the REC mechanism in the country, the majority of it being wind based. The rising inventory of unsold RECs is also affecting the financial viability of the 407 REC-based projects in the state.

Another major challenge hindering the development of renewable energy projects in Maharashtra is the weak implementation of the open access regime. According to Shanmugasundram, "Delays in getting the required approval from various utilities for open access is a major challenge being faced by renewable energy developers in the state." The state attempted to address this issue in July 2014 with MERC directing MSEDCL to allow open access through solar generators as the single source of power purchase. However, the recent increase in the cross-subsidy surcharge (CSS) by MERC has also affected the viability of the open access regime in the state. As per industry experts, after accounting for the revised CSS, wheeling charges and administrative charges as well as transmission and distribution losses, open access power is likely to cost more than Rs 3.60 per kWh, over and above the cost of purchasing power in the state. For extra-high voltage (EHV) express feeder consumers, the CSS in open access has been increased from Rs 1.63 per unit to Rs 2.75 per unit; for EHV non-express feeder consumers, it has been increased from Rs 1.20 per unit to Rs 2.26 per unit. In the case of high tension express feeder consumers, the CSS has been increased from Rs 1.18 to Rs 2.30 per unit and for high tension non-express feeder consumers, it has been increased from Re 0.76 to Rs 1.82 per unit.

MERC, in April 2014, rejected the application of 29 industries that had sought permission to buy power from the Indian Electricity Exchange or had made complaints against the state discom for not granting open access, considering its probable impact on the operational and financial strength of MSEDCL. As per industry experts, such moves are against the provisions of the Electricity Act, 2003 and the National Tariff Policy. Both regulations mandate a progressive reduction in surcharges and cross-subsidy surcharges, and recommend that state electricity regulators set a road map for the same. However, MERC has not yet formulated a road map, which defeats the purpose of the open access regime. Other issues hindering the growth of renewable energy capacity in the state are challenges related to land acquisition, power evacuation and securing right of way. Shanmugasundram points out that in terms of these issues, Maharashtra is among the toughest states.

Renewable Watch takes a look at Maharashtra's renewable energy initiatives and future plans…

Strong on wind

Wind power development in Maharashtra has gained momentum rapidly in the past two years. With a total installed wind power capacity of 3,472 MW, the state stands second in the country after Tamil Nadu. Maharashtra has among the highest wind power tariffs in the country and was one of the few states to introduce zone-based tariffs. In order to harness the state's 6 GW of wind potential, in July 2014, the regulator announced a separate policy for wind projects commissioned 2014-15 onwards. The policy has set a time limit of 15 months for the development of wind projects of up to 50 MW capacity, 21 months for projects of 50 MW-150 MW capacity, and 30 months for projects of above 150 MW capacity. In all three categories, a six-month extension has been provided to developers. For grid connectivity, the policy requires wind project developers to submit a performance bank guarantee of Rs 500,000 and a non-refundable processing fee of Rs 100,000 per MW. However, no specific wind installation target has been set by the state regulator under the policy. Considering the high wind repowering potential of the state, MERC has also suggested the formulation of a policy for the same and the promotion of pumped storage and energy storage schemes.

In April 2014, MERC also issued an order to address several issues hindering the development of wind projects in Maharashtra, including issues related to power purchase agreements (PPAs), obsolescence of technology and repowering of wind projects. The commission granted permission for extending the tenure of the existing PPAs to the project lifetime, if both parties were willing to do so.

Year-wise total installed renewable energy capacity in Maharashtra (MW)

	2011-12	2012-13	2013-14	As of August 2014
State	286.73	303.75	307.93	327.43
Private	3,343.32	3,853.07	4,460.87	5,302.76
Total	**3,630.05**	**4,156.82**	**4,768.80**	**5,630.19**

Source: Central Electricity Authority

Betting on solar

The state receives an average solar radiation of 4 kWh to 6 kWh per square metre each day. It has the capacity to generate 1.5 million kWh per MW annually through solar PV systems and up to 2.5 million kWh per MW annually through solar thermal systems. The state, however, does not have a solar-specific policy, and therefore promotes the segment under its Renewable Energy Policy, 2008.

In terms of harnessing its vast solar potential, Maharashtra is lagging behind, with only 284 MW of installed capacity as of September 2014. However, during the past couple of years, the state has witnessed a manifold increase in its installed solar capacity. The major contributor to this capacity addition is the Maharashtra State Power Generation Company, which established 125 MW of solar projects in 2013, the second largest in the country. Among private players, the biggest is Tata Power, with a total installed capacity of about 28 MW, followed by Welspun (20 MW) and Essel MP Energy Limited (20 MW). Although the Jawaharlal Nehru National Solar Mission provides the major impetus to solar industries in many states, most of the solar projects installed in Maharashtra are based on the REC mechanism.

Others resources

The state also possesses a high biomass- and bagasse-based cogeneration potential of about 1,887 MW (the second highest in the country) and 1,250 MW (the highest in the country) respectively. During 2012-13, Maharashtra was among the states that took the lead in installing biomass power projects. It is also among the few states that periodically revise tariffs for these projects according to market conditions, in order to make investments in these segments viable. However, there was not much escalation in tariffs for these projects between 2010-11 and 2012-13. For instance, tariffs for the Rankine cycle-based projects were not revised in 2011-12 and those for bagasse cogeneration projects were not revised in 2011-12 and in 2012-13. However, since these breaks, there have been considerable revisions in tariffs. At present, Maharashtra offers the third highest tariffs in the country for biomass- and bagasse-based cogeneration projects of Rs 6.41 and Rs 5.99 per kWh respectively.

However, the rate of harnessing the potential in the state has been very slow. As of March 2013, only 776.9 MW of biomass capacity and 623 MW of bagasse-based cogeneration capacity had been installed. This slow growth can be attributed to issues faced by the biomass industry across the country, including fuel shortages, price volatility and policy paralysis.

Currently, three waste-to-energy projects, with a cumulative capacity of 24 MW, are operational in the state. These are a 10 MW project by Rochem Separations Systems (India) Private Limited in Pune; a 4 MW plant by Organic Recycling Systems Private Limited in Solapur; and a 10 MW plant by Concord Blue Technology Private Limited in Pune.

Green initiatives

The presence of a large number of industrial consumers in the state offers a huge potential for energy conservation and could lead to annual electricity savings of about 726 MW. To this end, the Maharashtra Energy Development Agency (MEDA) has adopted strategies to develop a cost-effective mechanism for energy conservation that balances power demand and supply. MEDA is also working on the electrification of remote villages and hamlets under the Ministry of New and Renewable Energy's (MNRE) Remote Village Electrification Programme. As of June 2013, of the 353 villages covered under the programme, 340 villages had already been electrified.

Also, MEDA is promoting wind-solar hybrid systems for electrifying remote villages. The latest data on these projects has not been published yet by MEDA. According to the last update, as of July 2012, 28 projects aggregating 516 kW had been set up in the state and proposals for 50 projects with a cumulative capacity of 763.1 kW had been submitted to the MNRE.

The way forward

Given the state's high potential and various policy initiatives, Maharashtra's renewable energy segment is growing at a significant rate. During 2014-15 to 2016-17, MEDA plans to install 1,730 MW of renewable energy capacity, the majority of which will be wind energy based. The recent reintroduction of the accelerated depreciation benefit and the announcement of a new generation-based incentive scheme are likely to help the state achieve its wind installation target. However, a separate state-level policy is required to promote various renewable energy projects since the majority of the current installed renewable energy capacity in the state is REC based. ■