

Uttar Pradesh Solar Energy Policy 2022: Why ensuring successful execution is the key

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With India's commitment to achieving net zero by 2070, one of the milestones is attaining 500 GW capacity from non-fossil fuel-based sources by 2030. India has made significant progress in this regard, with installed [renewable](#) energy (RE) capacity reaching 120,900 MW as of 30 December 2022 ([solar power](#): 63,302 MW; wind power: 41,930 MW). However, more than 300 GW needs to be added to achieve the target by 2030.

Majority of this target is envisaged to be achieved through solar sources, owing to India's vast solar potential. As per the Central Electricity Authority National Electricity Plan 2022, India has around 748 GW of solar potential. To utilise this potential and thus aid India in spearheading the global climate commitments, determined efforts are needed from all states.

As per an assessment by the [National Institute of Solar Energy](#), [Uttar Pradesh](#) has a good solar potential of around 22.83 GWp. To harness this potential, the state released the UP [Solar Energy Policy](#) in November 2022.

Uttar Pradesh profile and solar policy

Uttar Pradesh is India's fourth-largest state and contributes to 16.2% of India's population. The state's climate and power sector initiatives are, thus, bound to have a significant impact on the national targets.

Uttar Pradesh has a total installed capacity of 29,858 MW. Around 72% of the installed capacity comes from thermal plants, which includes coal, gas, and diesel. Further, 16% comes from RE, 11% from hydro, and 1% from nuclear. Of 4,727 MW of RE capacity, 2,485 MW (53%) comes from solar, followed by 46% (2,193 MW) from bio-power. Remaining 1% is contributed by small hydro. The solar capacity installation vis-à-vis the potential is very low and requires major initiatives from all concerned stakeholders. The UP solar energy policy (2022) is a step in this direction and aims to accelerate the deployment of solar power and thus align with India's ambitious solar targets.

The policy aims to set up 22,000 MW Solar Power Projects by 2026–2027 in the state. Of this, around 14,000 MW capacity is to be added through utility-scale solar parks and the remaining 8000 MW through solar rooftop projects (4500 MW: solar rooftop [residential], 1500 MW: solar rooftop [non-residential], and 2000 MW: distributed solar generation [PM-KUSUM component C1 and C2]). The Uttar Pradesh New and [Renewable Energy](#) Development Agency ([UPNEDA](#)) will be the nodal agency for the implementation of this policy.

Action plan for the successful implementation of the policy

Uttar Pradesh has performed inadequately in terms of achieving solar targets over the past few years. The state could achieve only 23% (as of Dec 2022) of its 2022 solar target of 10,697 MW. One of the major constraints in meeting the desired target is land availability. Under the new policy, a land bank will be created by the UPNEDA that will be provided to state and central government undertakings and the private sector on lease at a rate of INR 1 per acre per year and INR 15,000 per acre per year, respectively, for a period of 30 years.

While this is a useful initiative, it is important that the land bank is accurately assessed to identify the solar potential of such lands. For this, a land parcel assessment with multi-criteria decision-making should be performed. Along with solar radiation, parameters such as land elevation, slope, and distance to substations and water bodies should be considered in the land parcel assessment.

The policy proposes to implement 'Saurya Uttar Pradesh Yojna' to promote the installation of grid-connected rooftop systems in the private residential sector. Under this scheme, the state government will provide a subsidy of INR 15,000/kW, up to a maximum limit of INR 30,000/- per consumer. This subsidy will be provided in addition to the central financial assistance available from the Government of India.

As of December 2022, the state has been able to set up only 259 MW of rooftop projects. To install 4,500 MW of residential rooftop systems, along with the subsidy, there is a need to generate accurate rooftop system potential and design using drone-based aerial photogrammetry for cities. Considering distribution companies (DISCOMs) in the state are cash-strapped, it is important to develop suitable business models, including third-party investment and rooftop lease, for specific consumer categories. This would ensure that there is no negative impact on DISCOM finances.

Further, under the [Solar City Programme](#), Ayodhya city will be developed as a model solar city (10% reduction in conventional energy demands). Overall, 16 municipal corporations of the state and Noida City will be developed as solar cities. For the successful execution of the programme, demand aggregation in a scientific and structured manner should be conducted to reduce capital costs and hence requisite tariffs. Multilateral financing institutions should be brought on board to provide low-cost and longer tenure financing for all consumer categories.

The policy proposes a capital state subsidy of INR 2.5 Crore/MW for utility-scale solar power projects set up with a 4-h battery storage system to promote round-the-clock power supply. Presently, the state DISCOMs obtain a major share of their electricity supply from coal sources (~75%) and only 3%–4% is sourced from solar. For the successful implementation of this initiative, DISCOMs will need to increase the supply share from such solar plants, in addition to scaling down coal plants. However, DISCOMs will still have to pay a fixed cost to the coal plants, owing to tied-up power purchase agreements. Thus, a techno-economic analysis involving coal plant generators, DISCOMs, and solar developers is necessary to promote this initiative and help supply clean power to consumers.

Moreover, the policy talks about constituting a high-level committee to resolve key bottlenecks during its implementation and to settle other inter-departmental issues that may arise. The solar policy, in this case, would require coordinated decision-making among various stakeholders such as consumers (residential, agricultural, etc.), DISCOMs, solar plant developers, and regulatory commissions. It is, therefore, critical that a representative from each of the concerned parties is part of the committee to voice their opinion and avoid any coordination-related challenges in the future.

The policy also mentions the creation of a corpus fund by the UPNEDA with the cooperation of the state and central governments and voluntary organisations working in the RE sector. This fund shall be utilised for the development of solar energy in the state. Notably, details on fund disbursement and utilisation should be publicly accessible to increase the accountability of the officials and ensure consumer awareness. Moreover, this would help in timely course correction of the initiatives.

Way forward

Growing concerns of global warming and climate change warrant emphasis on clean and green energy. The launch of the [Uttar Pradesh Solar Energy Policy](#) is a welcome move. To avoid any flaws in the execution of this new solar policy, accountability and responsibility of the concerned stakeholders should be ensured. A comprehensive roadmap outlining detailed activities/action plan for each of the stakeholders is required for the successful implementation of the policy. Further, timely assessment of the set targets through well-defined performance evaluation metrics is necessary.

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