

Solar Photovoltaic (SPV) Power

Karnataka is rich in solar energy resource with substantial amounts of barren and uncultivable land. Solar irradiation are in the range of 5.5 to 6 kWh/m²/day. As per NISE estimates, the State has a solar power potential of ~25 GW. The State has a very progressive solar policy, which substantially incentivizes solar energy development while minimizing the red tape associated with regulations and permissions. Although the growth of solar in the state has been modest in the recent past, growing to around 2 GW by 2017, the State has firm plans to add substantial amounts of solar capacity into its system. Unlike many other states, Karnataka has followed taluka-wise setting-up of solar capacity. The state has auctioned total bids of ~2 GW in two rounds. Under Karnataka's Power Sector Roadmap for 2021-22, state is planning to mandate ESCOMs to adhere to minimum levels of evacuation, to strictly enforce solar RPO, to site future PV plants in areas with alternate water supply and to conduct regular knowledge sharing and technical training sessions for engineers/technical staff in State. In 2016, KERC also came out with regulations for Forecasting, Scheduling and Deviation settlement framework for solar and wind generation in Karnataka which would provide a mechanism for integrating the RE capacity addition. KPTCL has also commenced construction of Renewable Energy Management Centre (REMC). Karnataka has target to add around 3.4 GW of ground mounted solar capacity by FY22 to meet its RPO and contribute to the national target of 100 GW. Under Vision 2025, state also plans to install 7.5 GW ground mounted solar capacity by 2025.

Level 1

Level 1 assumes that solar PV capacity addition will be significantly slower as compared to targets set for the State. Large scale integration of solar power could continue to remain a challenge and environment related externalities of conventional power will be un-priced. Capacity will reach around 4 GW by 2025 and then will gradually increase to 12 GW by 2050.

Level 2

Level 2 assumes that the state will achieve its target to add around 3.4 GW of ground mounted solar capacity by FY22. Thereafter, the capacity addition would follow the same trajectory and capacity will increase and reach up to 14 GW by 2040 and 18 GW by 2050. Full potential of 35.7 GW will still not be realized, which could be owing to challenges related to large scale integration of solar power.

Level 3

Level 3 assumes that prices of solar modules could further decrease due to increased efforts of the government for integration of solar power. The state will capacity addition will achieve its vision to add around 7.5 GW of ground mounted solar capacity by 2025. Thereafter, trend will continue and installed capacity will reach 17 GW in 2040 and 22 GW by 2050.

Level 4

Level 4 is a more aggressive scenario assuming a large increase in solar capacity, which could be likely if technology costs continue to fall, fossil fuel prices increase, or supportive government policies. This level assumes no barriers to capacity additions in solar power. Ancillary markets will be developed to support large scale grid integration of renewable energy. The State will achieve 13 GW by 2030 and will reach its potential of 25 GW by 2045.

