Investment Dynamics

Balancing Opportunities and Risks In India's Energy Transition

India has witnessed remarkable growth in the solar sector over the last decade. According to the Ministry of New and Renewable Energy, the overall installed capacity has increased from 2.82 GW in March 2014 to 87.2 GW in July 2024. This can be attributed to aggressive government targets, supportive policy frameworks, decreasing technology costs, and increasing awareness about climate change. While the sector is attracting significant investments from foreign and domestic sources, it also has inherent risks. Contrasting views prevail regarding the future of the solar market, and several factors suggest both opportunities and risks.

Opportunities

- **Government target and support:**

  The solar sector will play a crucial role in achieving India's revised target of 500 GW of renewable capacity by 2030. With the launch of the PM Surya Ghar: Muft Bijli Yojana—with a target of 1 crore households and the mandate for government buildings across India to achieve 100% rooftop solar saturation—there is vast potential for investments in solar projects. Land-neutral technologies, such as floating PV, are becoming increasingly viable in states with land constraints.

- **Domestic manufacturing:**

  With emphasis on domestic manufacturing through the reinstatement of the approved list of models and manufacturers (ALMM), there is an increased demand for domestic cells and modules. Associated equipment, such as floating structures for floating PV, also opens doors for manufacturing in India.

- **Energy demand:**

  To deliver a sustained GDP growth rate of 8% until the year 2031–32, there is a need to increase installed electricity capacity by six to seven times. Solar power can address these rising energy needs by reducing dependence on coal and mitigating environmental impacts.

Risks

- **Infrastructure limitations:**

  To accommodate increased capacity, substantial government funding is required for upgrading grid infrastructure and developing energy storage capabilities.

- **Policy ambiguity:**

  Regulatory changes and policy shifts can considerably impact investor confidence. Variability in state-level policies can disrupt investment plans and project timelines.

- **Economic viability:**

  Solar projects require considerable upfront investment, making viable long-term financing options and the financial health of power purchasing entities critical factors. The lack of tariff revisions in long-term power purchase agreements and delay in payments from power purchasing entities or delay in receiving central financial assistance can pose risks to project viability.

- **Land procurement and environmental concerns:**

  Acquiring land for large-scale solar projects is riddled with challenges, including competing land uses, regulatory barriers, and the potential for social and environmental conflicts that can escalate costs and timelines.

Despite these challenges, India's solar market continues to attract investments because of its long-term growth potential. Over the past decade, the solar energy sector has observed an incredible compound annual growth rate of ~35%. The sector generated a revenue of USD 10.4 billion in 2023 and is expected to reach approximately USD 25 billion by 2030. Innovative solar applications, such as agrivoltaics, building-integrated PV, and floating PV, can unlock fresh investment avenues and mitigate land-use conflicts. Although there are short-term uncertainties, the potential for long-term investment is encouraging. Cost optimisation, effective risk management, and securing profitable power purchase agreements can define success for investors.

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