



ACHINTYA

Achintya Securities Limited

India's Energy Journey

Deep Dive into Solar Manufacturing
& Renewable Energy Boom



Introduction

India's energy journey has evolved rapidly over the past decade, as the country gradually moves from a traditional fuel-based system towards a cleaner and more sustainable energy model. Rising industrialisation, urbanisation, and the expansion of the digital economy have consistently increased energy demand. To meet this demand, India has made significant investments in renewable energy, especially in the solar and wind sectors, while also expanding capacity at scale.



The Shift in Energy Policy

Key Policies and Initiatives

Over the last 10 years, a clear shift has been seen in India's energy policy, with a stronger focus on goals such as energy security, reducing import dependency, and achieving lowcarbon growth. Key policies and initiatives that have driven this shift include:

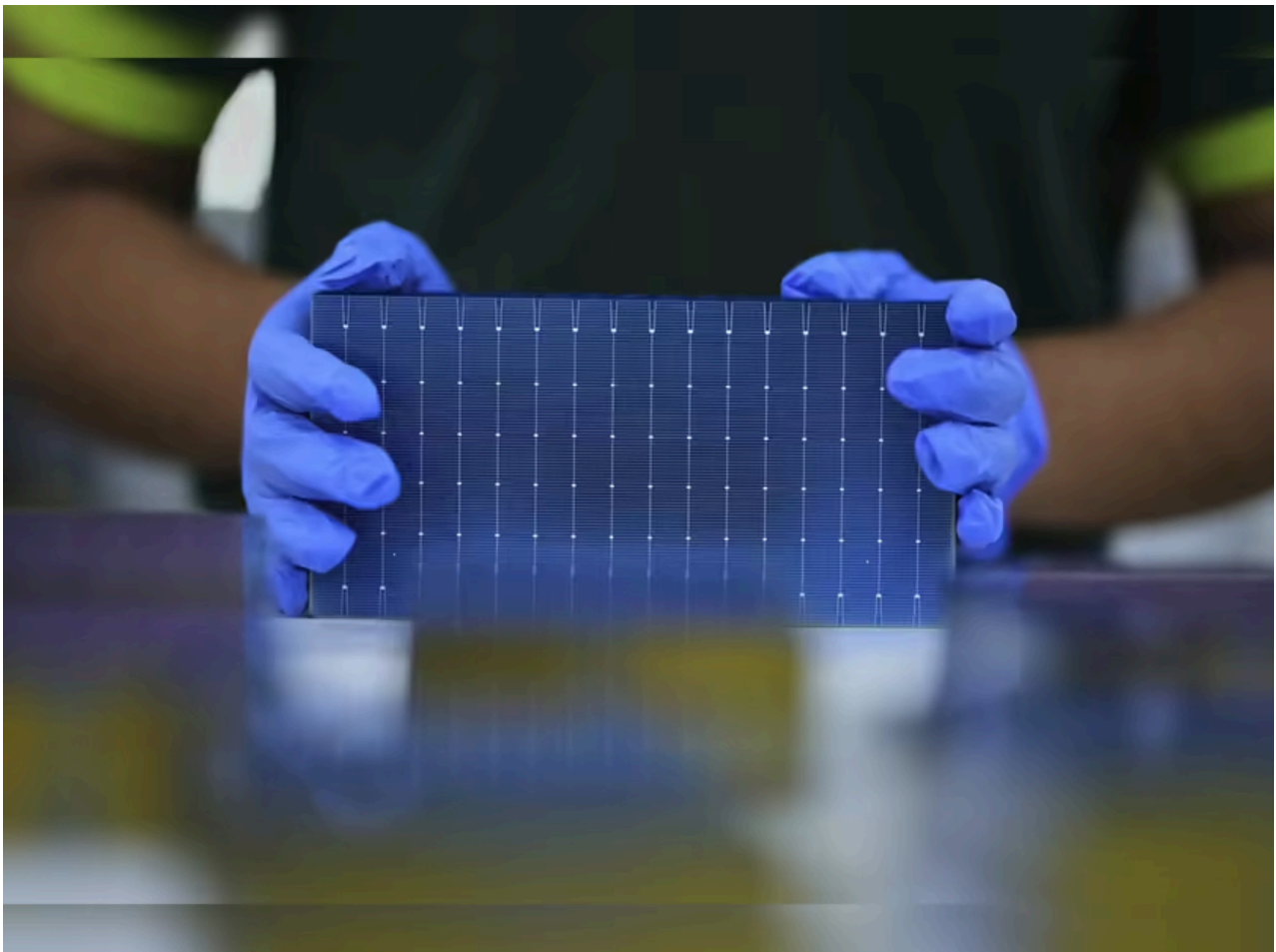
- **National Solar Mission:** Launched in 2010, this mission aims to establish India as a global leader in solar energy by promoting the use of solar power for various applications.
- **Approved List of Models and Manufacturers (ALMM):** This policy promotes domestic manufacturing by mandating the use of domestically manufactured solar modules in government projects.
- **PM Surya Ghar Muft Bijli Yojana:** This scheme aims to provide free electricity to households through rooftop solar installations.



Impact on Energy Imports, Domestic Production & International Influence

These policies have had a significant impact on reducing India's dependency on energy imports. For instance, the share of coal in India's Total Primary Energy Supply (TPES) has decreased from 60.21% in FY 2023-24 to around 55% in recent years. This shift has been accompanied by an increase in domestic production of renewable energy.

India's energy policy is also influenced by its international commitments, such as the Paris Agreement. The country has pledged to reduce its carbon intensity by 33-35% by 2030 compared to 2005 levels and to achieve 40% of its installed electricity capacity from non-fossil fuel sources by 2030.



Solar Manufacturing Capacity: A Decade of Growth

Key Policies and Initiatives

India's solar module manufacturing capacity has increased from 3 GW to 172 GW over the past decade, reflecting a major shift in the country's clean energy transition. Currently, India's domestic solar cell manufacturing capacity stands at 27 GW, which is an important step towards developing the entire value chain.

Technological Advancements in Solar Manufacturing

Technological advancements have played a crucial role in the growth of India's solar manufacturing sector. Innovations in solar panel efficiency, energy storage solutions, and smart grid technologies have made solar energy more accessible and affordable.

Key Players in the Solar Manufacturing Sector

Some of the key players in India's solar manufacturing sector include:

- **Tata Power Solar:** One of the largest solar manufacturers in India, with a capacity of over 1 GW.
- **Adani Solar:** A major player in the solar manufacturing sector, with a capacity of 1.5 GW.
- **Vikram Solar:** A leading manufacturer of solar modules, with a capacity of 1 GW.

Rooftop Solar Installations: A Rapidly Growing Segment

PM Surya Ghar Muft Bijli Yojana: Targets and Achievements

Under the PM Surya Ghar Muft Bijli Yojana, around 10,000 rooftop solar units are being installed every day, and so far, 40 lakh rooftop installations have been completed. This scheme aims to provide free electricity to households and reduce their energy bills.

Impact on Household Energy Consumption and Costs

Rooftop solar installations have had a significant impact on household energy consumption and costs. Households with rooftop solar installations have seen a reduction in their electricity bills by up to 50%.

Challenges and Opportunities in Scaling Up

Despite the rapid growth, there are challenges in scaling up rooftop solar installations, including:

- **High Initial Costs:** The initial cost of installing rooftop solar systems can be high, although government subsidies help mitigate this.
- **Lack of Awareness:** Many households are not aware of the benefits of rooftop solar installations.
- **Regulatory Hurdles:** There are regulatory hurdles that need to be addressed to streamline the installation process.

India's Energy Demand and the Renewable Shift

In FY 2023-24, India's Total Primary Energy Supply (TPES) reached 9,03,158 KToE, of which coal accounted for 60.21%, crude oil for 29.83%, and natural gas for 6.99%. The contribution of renewable energy is also steadily increasing. From 17,682 KToE in FY 2014-15, renewable energy supply rose to 31,847 KToE in FY 2023-24, reflecting strong growth over the last decade.

While solar energy has seen significant growth, other renewable energy sources such as wind and hydro also play a crucial role in India's energy mix. As of March 2024, India's total renewable energy potential has been estimated at 21,09,655 MW, with wind energy accounting for 11,63,856 MW (55%) and solar energy for 7,48,990 MW (around 36%).

Energy storage solutions are critical for the integration of renewable energy into the grid. Advances in battery technology and energy storage systems are helping to address the intermittency issues associated with renewable energy sources.



Policy Support and the Manufacturing Ecosystem

The Approved List of Models and Manufacturers (ALMM) and Its Impact

The ALMM policy has been instrumental in promoting domestic manufacturing. As of March 2026, a total solar module manufacturing capacity of 1,72,592 MW has been recorded across 17 states. This policy has helped reduce import dependency and promoted the growth of the domestic solar manufacturing sector.

State-Level Initiatives and Contributions

At the state level, several states have emerged as major manufacturing hubs:

- **Gujarat:** 80,060 MW
- **Rajasthan:** 21,779 MW
- **Tamil Nadu:** 15,199 MW
- **Maharashtra:** 11,414 MW
- **Haryana:** 9,749 MW

The growth of the solar manufacturing sector has led to significant job creation and economic benefits. The sector has created thousands of jobs in manufacturing, installation, and maintenance, contributing to the overall economic growth of the country.

Implications for Investors

The Investment Climate in the Renewable Energy Sector

India's rapidly growing electricity demand and increasing focus on renewable energy could make the solar sector a long-term growth theme. In FY 2023-24, Total Final Consumption (TFC) reached 6,13,605 KToE, which is 38% higher compared to FY2014-15.

Recent investments in the renewable energy sector have shown promising returns. For example, investments in solar manufacturing companies have seen significant returns due to the growing demand for solar modules and the government's focus on domestic manufacturing.

Key Companies and Startups in the Solar Energy Sector

Some of the key companies and startups in the solar energy sector that are attracting investment include:

- **ReNew Power:** One of the largest renewable energy companies in India, with a focus on solar and wind energy.
- **Azure Power:** A leading solar power producer in India, with a portfolio of over 7 GW.
- **Oorja Energy:** A startup focused on providing solar energy solutions for rural and off-grid communities.

Future Plans and Conclusions

India aims to expand clean energy capacity to ensure long-term energy security. The growth in solar manufacturing from 3 GW to 172 GW indicates that the country is steadily moving towards a self-reliant energy ecosystem.

The government plans to mandate the use of domestically manufactured cells in all solar projects from June 2026 and aims to develop 42 GW of domestic solar cell manufacturing capacity by 2026. This move can further strengthen domestic manufacturing and support the entire value chain.





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