INDIA FACTS

Laying the Foundation for a Bright Future: India's National Solar Mission

India's National Solar Mission, launched in 2010, seeks to catalyze widely accessible and affordable breakthrough solar technologies to power India's rapidly growing economy. The Mission aims to install 20,000 megawatts (MW) of grid-connected solar power and 2,000 MW of off-grid solar power projects by 2022. The Mission encourages both solar photovoltaic (PV) and solar thermal technologies, and promotes solar energy in diverse applications like lighting and cooking.

WHY SOLAR ENERGY?

Abundant potential. India has nearly 300 sunny days in most regions, and average incident solar radiation ranges between four to seven kilowatt hours per day/per square meter — much higher than most other countries.[1] Case-in-point: the largest state in India, Rajasthan, is roughly the same size as Germany, yet it receives twice the intensity of solar radiation for more than twice the number of days as Germany, which is the world's current solar power leader.

Energy security. India's power consumption has grown faster than its gross domestic product for the past 20 years. Oil and coal account for 70 percent of India's primary energy supply. With rapidly-urbanizing cities demanding more power, renewable energy, including solar, is critical to provide electricity while reducing dependence on imported fuels.

Clean energy. Solar technologies have limited environmental impacts and can contribute significantly to India's target of reducing greenhouse gas emissions from 2005 levels by 20 to 25 percent by 2020. Solar power has the potential to save 95 million tons of CO2 emissions annually by 2022.[2]

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India's National Solar Mission 2010-2022			
Solar Technology	**Phase I (2010-2013)**	**Phase II (2013-2017)**	**Phase III (2017-2022)**
Grid-connected/rooftop	1,000-2,000 MW	4,000-10,000 MW	20,000 MW
Off-grid solar applications	200 MW	1,000 MW	2,000 MW
Solar hot water collectors	7 million square miles	15 million square miles	20 million square miles
Solar lantern/lighting systems	N/A	N/A	20 million systems

INSTITUTIONAL SUPPORT AND INCENTIVES

Government agencies. The Ministry of New and Renewable Energy (MNRE) is implementing the Mission, the Indian Renewable Energy Development Agency (IREDA) focuses on renewable energy financing, and the National Thermal Power Corporation (NTPC) Vidyut Vyapar Nigam facilitates Power Purchase Agreements.

Government incentives include:

- **Feed-in tariffs.** Utility-scale solar projects are guaranteed grid access for 25 years with feed-in tariffs higher than the cost of conventional electricity.
- **Generation-based incentives.** IREDA provides incentives to states and utilities for every unit of power purchased from rooftop PV and small-scale solar power plants.
- **Manufacturing incentives.** Special incentives provide capital subsidies, low-interest loans, and tax incentives for integrated manufacturing facilities.
- **Off-grid incentives.** Capital subsidies ranging from 30 to 90 percent are available for solar lighting and other solar energy uses in rural communities.
- **Creating demand.** State utilities must purchase 0.25 percent of their annual power from solar projects under India's Renewable Purchase Obligation (RPO), which is expected to increase to 3 percent by 2022. State utilities can also purchase solar-specific Renewable Energy Certificates (RECs) from projects.

HOW BIG IS THE TARGET?

In 2010, India's solar power capacity was less than 20 MW and the 2020 target was larger than the 19,000 MW of existing solar power worldwide. Now global solar capacity has doubled to 40,000 MW and continues to be one of the world's fastest growing power technologies.[3] India could aim even higher, given the potential and growing demand for clean energy.

EARLY PROGRESS

Indian industries have responded positively to the Mission. There were over 400 projects applications in the first government auction, though only 37 projects were selected. India's largest industrial conglomerates (Reliance, Tata, and Birla) are increasing solar investments, new players have emerged, and government entities (Oil and Natural Gas Commission, NTPC, and Bharat Heavy Electricals Limited) are implementing large-scale projects. Several states have also launched policies to promote solar projects.

LOOKING FORWARD

The key to scaling up solar power lies in its ability to be cost competitive. KPMG-India predicts that with policy support and investment, solar energy could achieve grid-parity with fossil fuels by 2019-20. The Mission has the potential to transform India's energy sector and help power its rapid economic growth while building a sustainable future. India needs continued government and private sector support, increased investment in manufacturing, and more technology sharing to unleash this potential.

About the Council on Energy, Environment, and Water and the Natural Resources Defense Council

The Council on Energy, Environment, and Water (CEEW) and Natural Resources Defense Council (NRDC) are partnering to conduct an assessment of the National Solar Mission to accelerate clean energy solutions in India.

CEEW is an independent, not-for-profit policy research institution that works to promote dialogue and common understanding on energy, environment, and water issues in India and elsewhere. www.ceew.in.

NRDC, a leading U.S.-based environmental organization, is working with partners in India on efforts to solve our shared challenges of climate change and clean energy. www.nrdc.org/international/india.

Sources

1 Sharma, Atul. A comprehensive study of solar power in India and World. Renewable & Sustainable Energy Reviews (2011). http://www.sciencedirect.com/science/article/pii/S1364032110004521.

2 KPMG-India. The Rising Sun: A Point of View on the Solar Energy Sector in India (2011). kpmg.com/IN/en/IssuesAndInsights/ThoughtLeadership/The_Rising_Sun_full.pdf.

3 REN21. Renewables 2011: Global Status Report (2011). ren21.net/Portals/97/documents/GSR/GSR2011_Master18.pdf.