COORDINATING MINISTRY FOR ECONOMIC AFFAIRS
THE REPUBLIC OF INDONESIA

NATIONAL ECONOMIC COUNCIL
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How Distributed Renewable Energy (DREs) Empower Inclusive Energy Access: India Experience

Cross-Regional Learning from South Asia

10–12 February 2026 • Jakarta, Indonesia

In collaboration with UNOPS, The University of Melbourne, NOSSAL INSTITUTE

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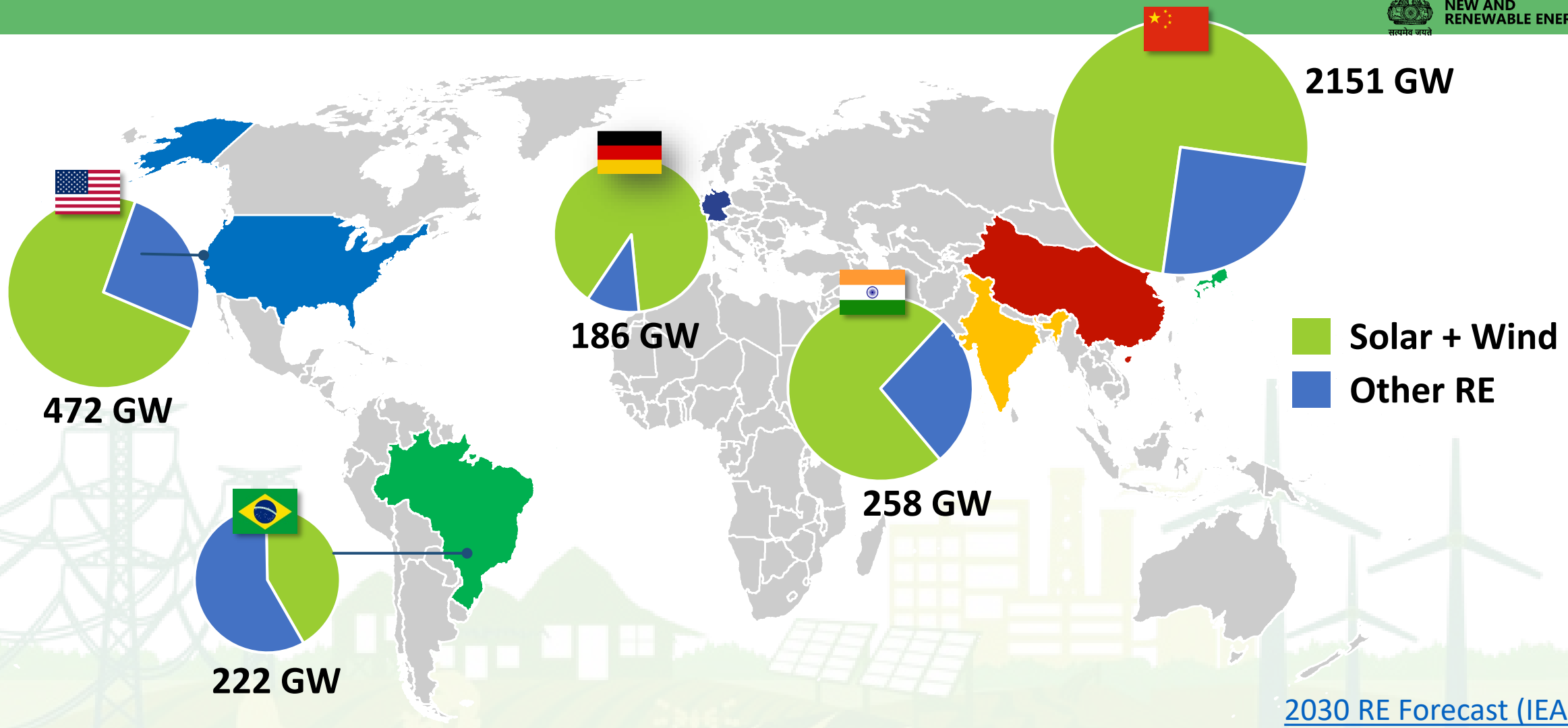
Global RE Scenario – India ranks 3rd

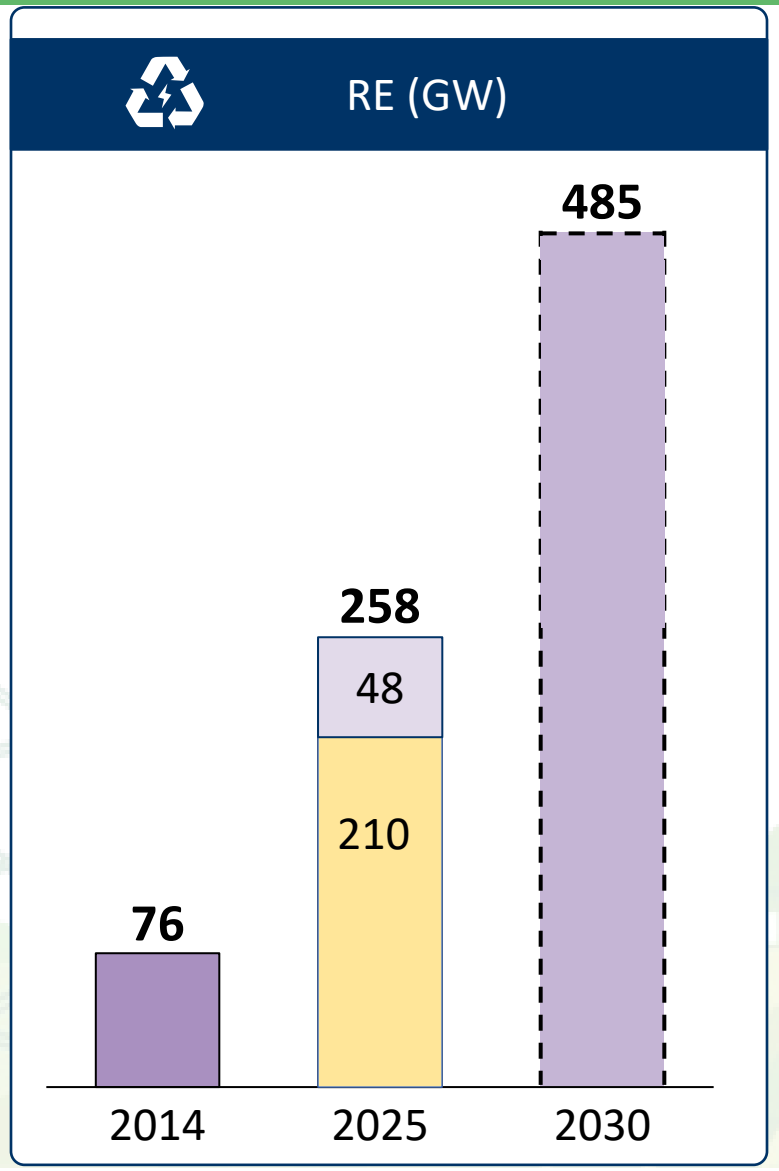


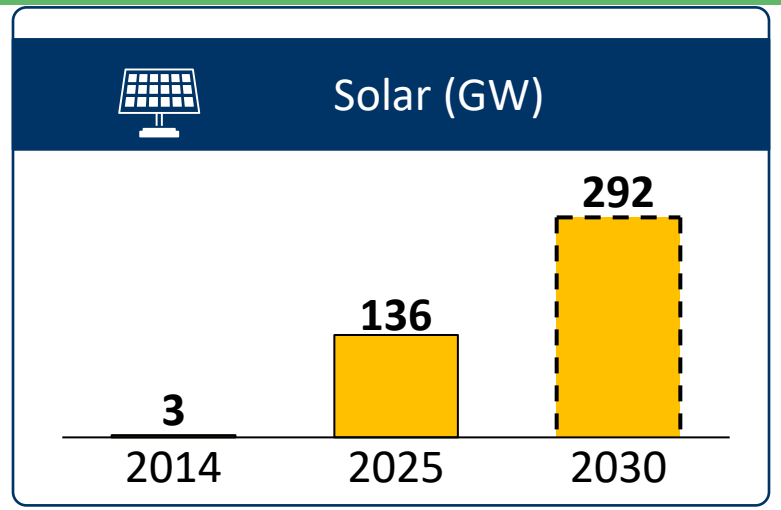
2030 RE Forecast (IEA)

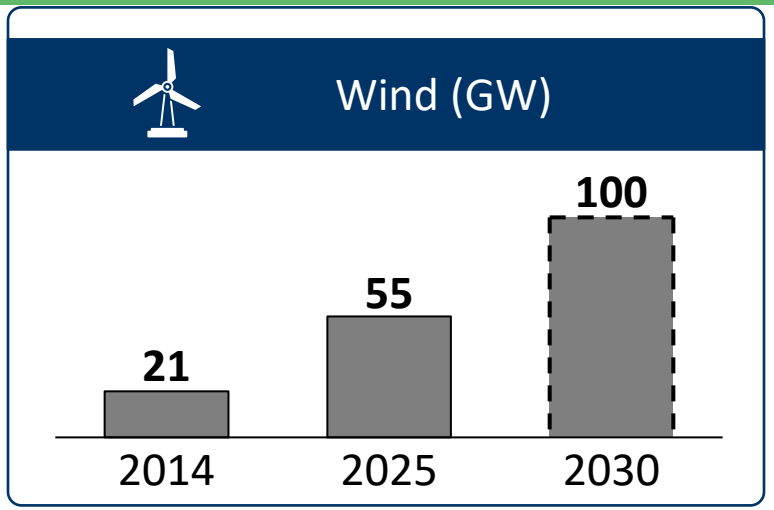
India is 3rd in Solar and 4th in Wind

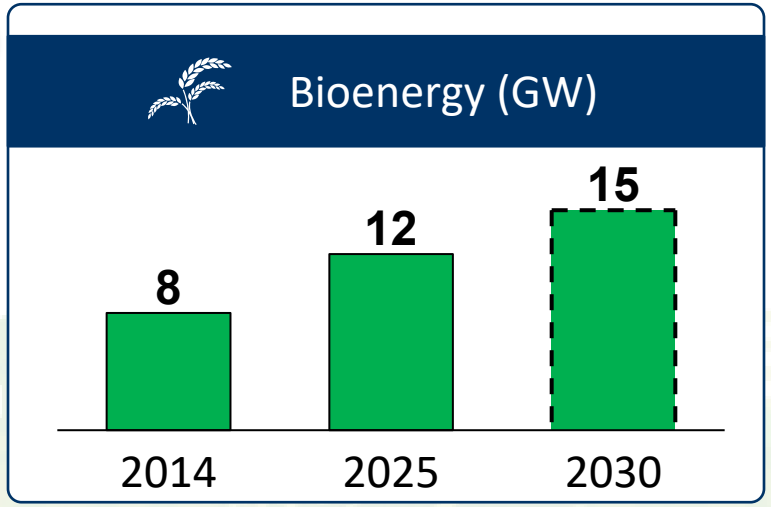
Global RE Installed Capacity: 4,443 GW

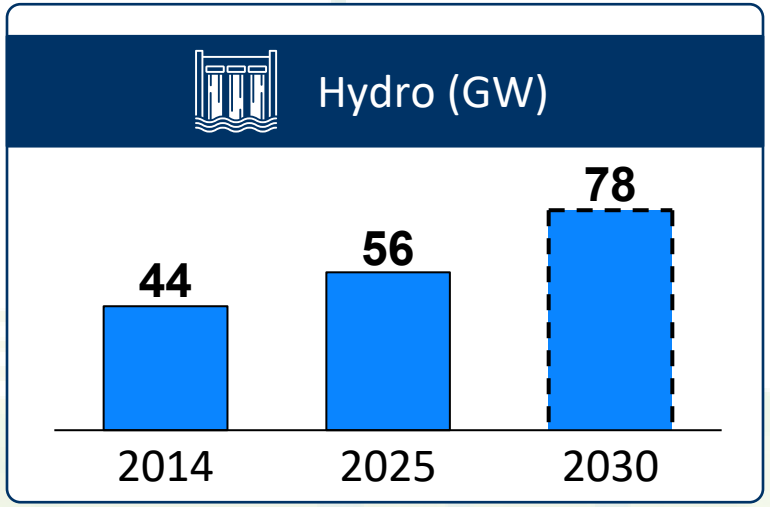
India's RE – Growth and Target











Solar Wind Hydro Bioenergy

Installation data till 31.12.2025

PM- Surya Ghar- World's Largest Rooftop Scheme

10 Million

Households to be provided rooftop solar systems

INR 750 Billion (~9Billion USD)

Financial outlay

Upto **300 units** free electricity every month

Upto **INR 78,000 (~917 USD)**

per consumer subsidy for 3 kW system

6% interest rate: Easy and Affordable Loan

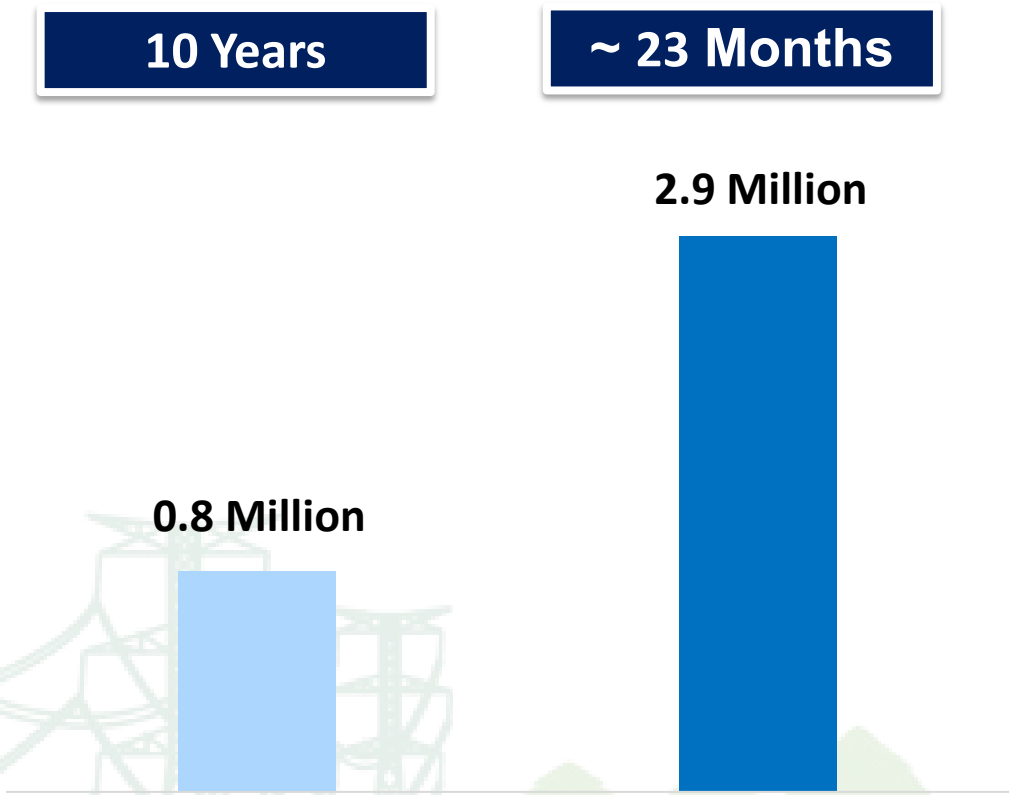
100% online process for approvals and subsidy

1.7 Million

Expected direct employment

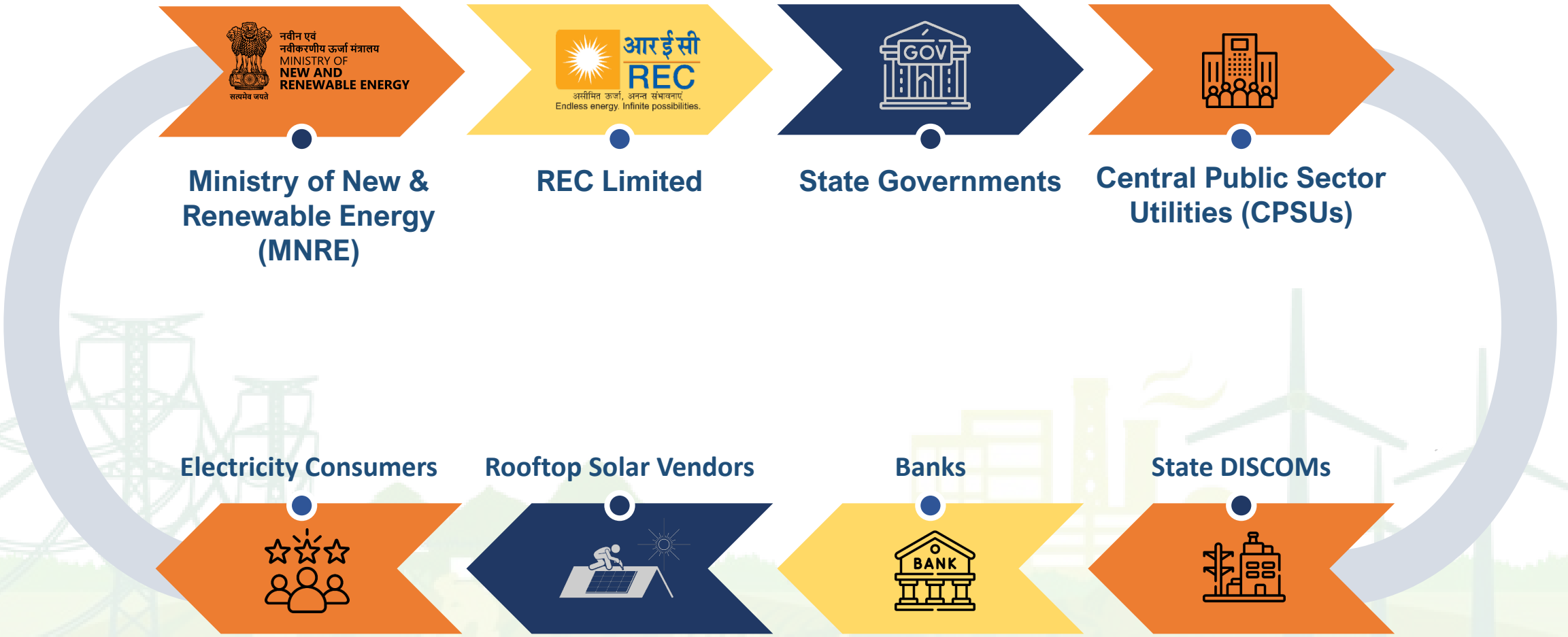
720 million tonnes: Total CO_2 emissions saved

PM- Surya Ghar- India's Roof Top Solar Scheme



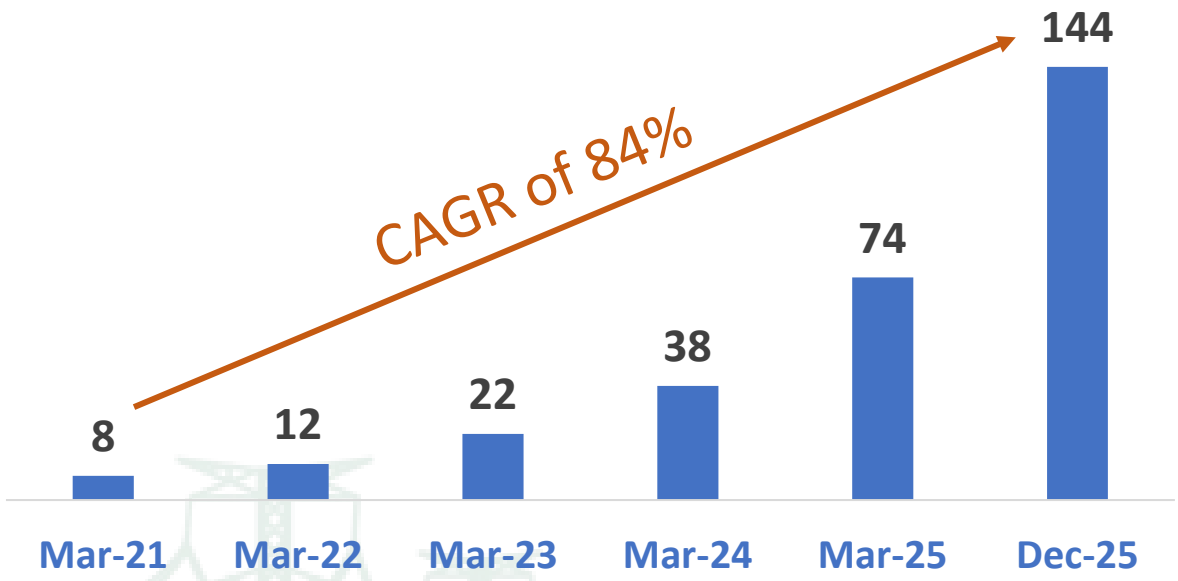
India's Overall RTS Capacity has reached staggering ~24GW (including 8.5 GW installed under scheme)

Roof Top Solar Scheme- Key Stakeholders

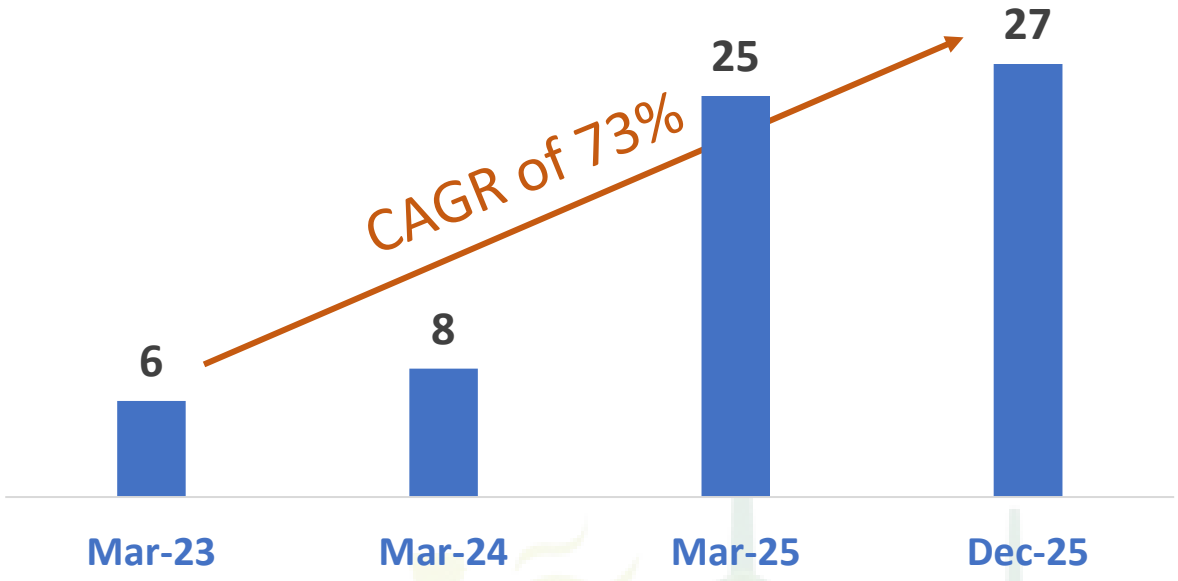


Cleantech Manufacturing of Solar Modules and Cells

India Solar Module Capacity (GW)



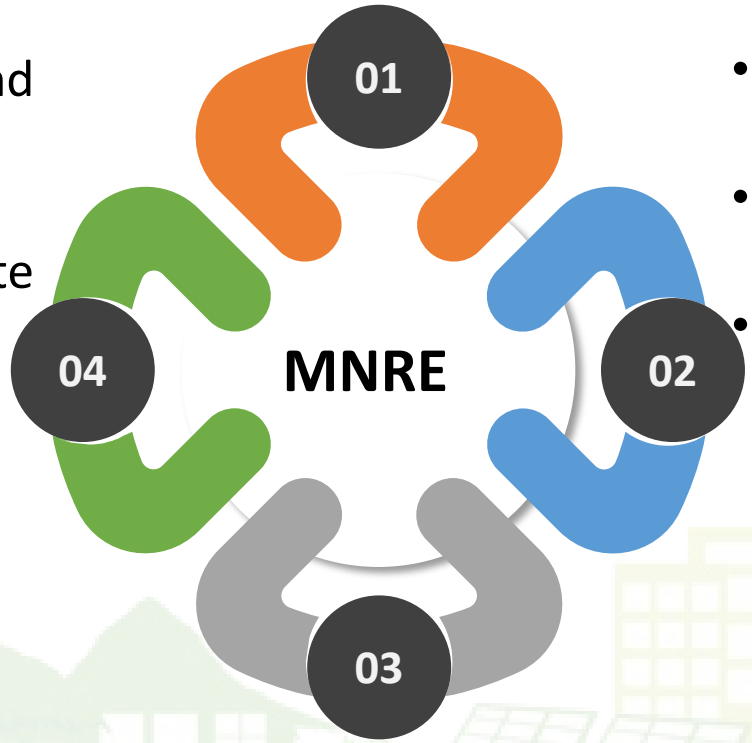
India Solar Cell Capacity (GW)



- India's solar module and cell manufacturing capacity has scaled up rapidly, signaling strong investor confidence and a maturing domestic supply chain
- India's Viability Gap Funding (VGF) for Battery Energy Storage Systems (BESS) is enabling grid-scale renewable integration while catalysing domestic manufacturing and private investment.

4. DISCOM

- Ensure Timely inspection and commissioning
- Grievance Redressal within time
- Mobilize consumers and complete net metering agreements



1. Consumer

- Identify key target households (say >200 units)
- Engage through multiple channels for collecting applications on Portal
- Conduct Bank Vendor Melas

3. Bank

- Review loans saction in DLBCs
- Assign branchwise targets
- Ensure ease of financing at 6.0%

2. Vendor

- Identify and add Local Active Vendors
- Ensure fair competition- Vendor Rating
- Redress Consumer Grievances
- Bank vendor coordination

Prime Minister Surya Ghar; Muft Bijli Yojna

2.9 Million
Households Benefited

1.2 Million
beneficiaries received Zero Electricity Bills

$47 Million
beneficiaries earned through surplus generation

800K
beneficiaries received approval for collateral-free loans

170K
persons trained as Solar Technicians/ Helpers

92,000
Government Buildings Solarized

$1.8 Billion
Subsidy Directly transferred to Beneficiaries

97%
Grievances resolved via the Grievance Mgmt. System

Government of India's: Flagship DRE programs

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

Energy Transition --- "Driven by Equity and Inclusion"

PM Surya Ghar

To support 10 million low- and middle-income consumers

नवीन एवं नवीकरणीय ऊर्जा मंत्रालय
MINISTRY OF NEW AND RENEWABLE ENERGY
सत्यमेव जयते

PM- KUSUM

About 22% Electricity is consumed for agriculture (Irrigation)

Rooftop solar 1-3 kW

Agricultural Solarization

Overview of PM-KUSUM Scheme (Agri- Solar Program)

Components under the scheme	Targets	Incentives/ Govt. assistance
 **Component A:** Setting up of Decentralized Ground/Stilt Mounted Grid Connected Solar or other Renewable Energy based Power Plants on barren/uncultivable lands.	• Solar capacity target: 10 GW • Each plant capacity is 500 kW to 2 MW.	• PBI to DISCOM- Lesser of ₹0.4/kWh or ₹6.6 lakhs/MW /year for 5 years from COD.
 **Component B:** Installation of off-grid standalone solar-powered agricultural pumps of individual capacity up to 7.5 HP for off-grid areas and to replace diesel pumps.	• Solar capacity target: 9.6 GW • Installation of 20 lakh standalone solar-powered agricultural pumps	• Central Govt. assistance - 30% • State Govt. assistance - 30% • Farmer's contribution- 40% (30% loan, 10% equity)
 **Component C1:** Pump level solarization of grid-connected agricultural pumps of individual capacity up to 7.5 HP.	• Solar capacity target: 11.2 GW	• Central Govt. assistance - 30% • State Govt. assistance - 30% • Farmer's contribution- 40% (30% loan, 10% equity)
 **Component C2:** Feeder level solarization after aggregating the grid-connected agricultural pumps and feeding excess power to the grid.	• Solarization of 15 lakh grid-connected agricultural pumps	• Central Govt. assistance - 30% • Feeder Capex – 70% loan by Discom • Feeder RESCO – State Govt VGF &remaining cost by developer

However, the progress was slow due to various challenges faced by farmers, Discoms and developers.

Government of Maharashtra: Need for KUSUM

Maharashtra is home to more than 10 million farmers, who contribute to 30% of the state's electricity consumption

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

10 million
Farmers

4.5 million
Agri. Electricity Connections

12 %
Contribution GSDP

16,000 MW
Connected load

Maharashtra has the highest Agriculture demand in India (39,000 MUs)

Agriculture sector highly subsidized & the Major cause of Revenue losses to Discom ($800 million to $1 billion / year -Subsidies)

Sector issues: Constraints to Agriculture Solarization

(Agriculture solarization in Maharashtra faces fundamental development problems)

Most farmers are marginal & financially constrained

Socio-economic barriers

Only 10-20% of the workers are locally hired

Limited Community Involvement

Inadequate and aged Distribution assets in Rural areas

Poor Distribution Network

High Electricity Subsidies – no incentive for farmers to switch to Solar

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

Seasonal and Intermittent Pump Usage- Irrigation pumps are not required all year

Challenges Addressed by MSEDCL through Design

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Maharashtra State Electricity Distribution Co. Ltd.

Small Project Size + Aged Rural Grids	Land Availability	Delay in Permissions / NoCs	No Data Availability to Developers	Delay in Payments to SPDs
Aggregation by Utility (0.5 MW to 15 MW) Viability Gap financing Modernize the Rural network Distributed BESS avoid curtailment **Economics of Scale for Solar Power Developer**	Identification of Govt. land within 5-10 km radius from of 33/11 KV Sub-Station. **40,000 Acres Govt. Land identified in 3 months.** **Extensive use of Govt Land Portals.**	• Advance Clearance • Advance Grid Connectivity **More than 6,000 NoCs and Grid Connectivity Permissions issued.**	Data Room With GIS Layered details of each land parcel **Geo Tagged Substations & land parcel details**	• Creation of revolving fund mechanism • Provision for Deemed Generation • Nodal Agency to extend (MSEDCL) • **Provision of $12.5 million / 1000MW from Green Cess Fund**

Single Window Portal for Private Sector Developers

MSKVY 2.0

Result: 16,000MW Solar Capacity Awarded in 10 months

(Aggregation and utility led development helped to address issues)

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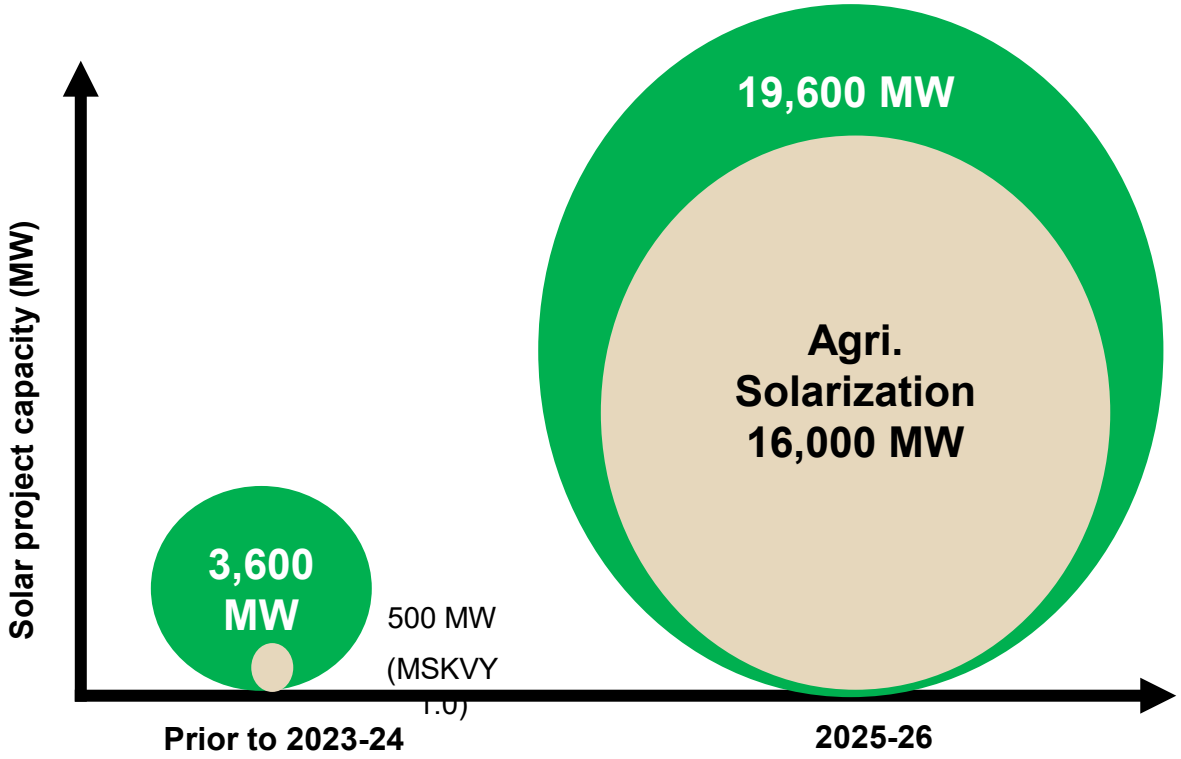


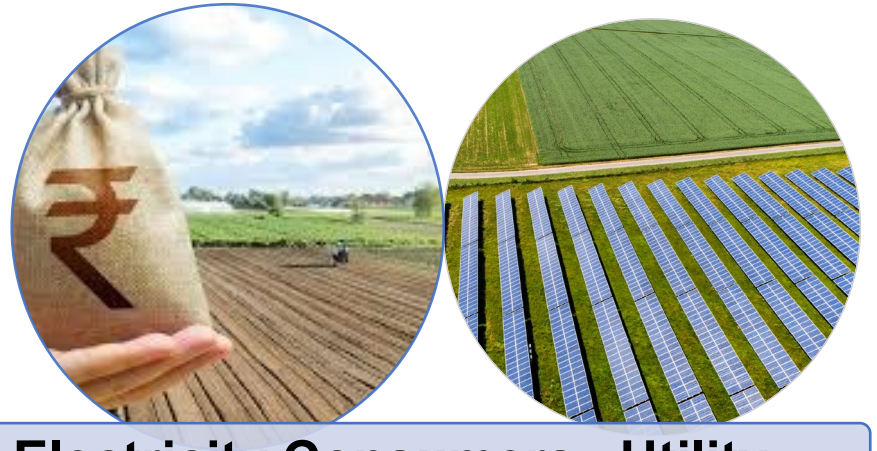
- Transparent **e-bidding** process
- Cater to **more than 90%** of agriculture demand across **27 districts** in the state
- Average tariff discovered **Rs. 3.08/kWh**

vs average power purchase cost **Rs. 6.00 /kWh**

- All **regulatory approvals** in place along with tariff adoption
- Over **30% of the projects** commissioned in within **12 month** of award of LoA.

Solar energy capacity of Maharashtra will be ~6 times of the present solar capacity within next 30 Months

KUSUM / MSKVY 2.0: Game Changer for all Stakeholders



Electricity Consumers , Utility and Government

Reliable power supply

at desired voltage level

Reduced Subsidy Injection

by government

Reduced Cross Subsidy

by other consumers and no dependency on subsidy

Farmers in Maharashtra

Day Time Electricity

Additional income

1.25L ($1,500) per Ha per annum
from leasing of non-fertile land

Lower electricity tariff

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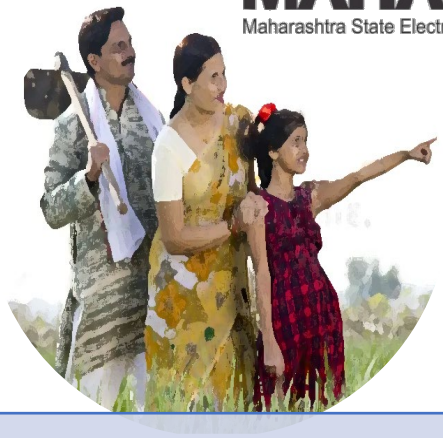

State of Maharashtra

Increased Participation of women workforce

Due to day-time availability of power

30 Lakhs women benefitted

Social Development Grant to Gram Panchayat

MahaSKY: Empowering Communities Through Solar

The Challenge: Solar installations without local skilled workforce = unsustainable future.

The Solution: **Maharashtra Saur Kaushal Yojana (MahaSKY)** - comprehensive training program for rural communities focused on solar project operations and maintenance.

The Focus:

Women: High dedication with community-wide economic empowerment effects.

Youth: Technology-ready, represent India's renewable energy future.

Local Talent: Reduced operational costs, faster maintenance response.

The Impact: ***Communities shift from passive beneficiaries to active stakeholders***

- ✓ MahaSKY targets skill development of **5,000 participants (30% women) -300+ participants trained till date**.
- ✓ Training program and certification aligned with government requirements.
- ✓ Practical, Hands-On Training - participants work with actual solar equipment.
- ✓ Zero Distance to Jobs - Direct employment pipeline to MSKVY 2.0 solar developers.
- ✓ Guide interested participants in setting up their own solar O&M businesses.

MahaSKY: *Technology empowers. Skills sustain. Together, they power India's green revolution.*

Launch of the MahaSKY program

First batch of MahaSKY program

Classroom Learning Lab

Practical, Hands-On Training

Learning Assessment and Practical Test

Certificates to MahaSKY participants

India: How DERs Empower Low-Income Energy Access

GOI's Approach for Social inclusion and low-Income Energy Access

1. PM Surya Ghar - Model Solar Villages which promotes 24x7 power targting rural population
2. Utility led aggregation (done by DISCOMs) to support most subsidized consumers, low-income, or rural households.
3. GOI developed a framework to promote DRE livelihood applications
4. Six-Step Framework (Assessing Demand, supporting Research and Development, Pilot and Up-scaling of DRE livelihood applications, Providing Access to Finance/ Capital, Supporting Skill Development & Capacity Building; and Public Information and Awareness)
4. Mapping Stakeholders (End users, Enterprises, and Ecosystem actors)

ADB Support

1. Enhancing institutional capacities of Govt agencies on Gender equality and inclusion (conducting gender assessment, preparing strategies/action plan to increase women participation in DRE based livelihoods)

2. Training and capacity building

3. Skills training for marginalized community incl. women in relevant technologies supported by TA and Grants
   - For e.g. Green livelihoods supported in Maharashtra [5,000 persons (1,500 women) provided skills training and certifications to support green livelihoods
   - Promoting entrepreneurship to pursue green-energy entrepreneurship options
   - promoting technology led development
   - Training community incl. Women collectives (SHGs) to take jobs in installation, operation, maintenance and repairing.

4. Support to diversify existing livelihoods (enhancing and supporting women vendors to improve their capacities and rating;

Impact for rural populations and women

A CEEW study covered 767 end-users across 19 Indian states and identified the following impacts – economic, social, increase on productivity, women and the environment.

Economic impact	• **71% of end-users experienced an increase in income.** • **35% increase in annual income was experienced by a typical user**
Social Impact	• 86% end users had improved confidence to earn and work. • 88% end-users experienced increased support of family members/spouses
Impact on productivity	• 2X increase in productivity of silk reeling users compared to earlier reeling practices. • For ex- increase in milk yield on using solar vertical fodder grow unit
Impact on women	Women end-users reported positive changes in their: • Reduced physical effort/drudgery (70%) • Enhanced knowledge and skills that made them more relevant in the workforce (92 per cent) • Enhanced Mobility (72 per cent) • Increased participation in community events (89 per cent) • Agency to make decisions (76 per cent)
Environmental Impact	• DRE-powered livelihood technologies helped to mitigate potential GHG emissions compared to a business-as-usual scenario in which conventional, inefficient, and fossil fuel-powered technologies are used • Cumulative emissions mitigated from over 7,000 deployments of the 6 technologies covered by the CEEW study during June 2020–April 2022 was around 660 metric tonnes of CO_2 emissions

THANK YOU!

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INCLUSIVE ENERGY TRANSITIONS IN SOUTHEAST ASIA AND BEYOND

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