

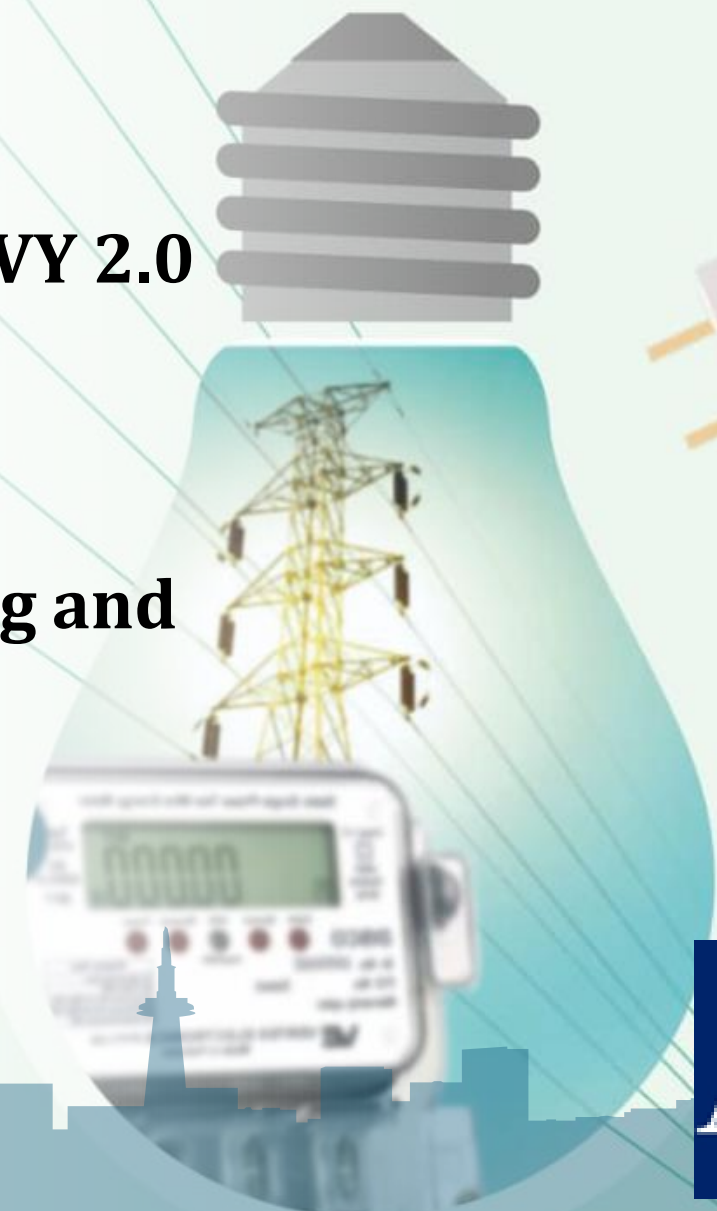


Maharashtra Power Distribution Enhancement Program for Facilitating Agriculture Solarization

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Mukhyamantri Saur Krushi Vahini Yojana (MSKVY) 2.0

About MSKVY 2.0: Innovative and ambitious

Distributed solar power for agriculture consumption, modality similar to feeder level solarization under Component C of PM-KUSUM. Developers paid under RESCO mode

Innovative

- Builds upon learnings from MSKVY and Feeder Level Solarization under Component-C of PM-KUSUM
- MNRE has praised features of MSKVY 2.0 including land pooling, development of land portal and obtaining pre-clearance before award of the project and included the same in PM-KUSUM guideline (January 2024)
- Separate funds allotted for:
 - Payment security for IPPs (Rs 100 crore per GW) thereby reducing their risks
 - Strengthening of substations where solar power would be injected (Rs 25 lakh per sub-stations)
 - Developing Gram Panchayats where solar plants would be set-up (Rs. 5 Lakhs for 3 years)

Ambitious

- **Target:** 7000 MW distributed solar to be set-up in Phase-I (till 2025) and 17000 MW overall. MSEDCL has already issued LoA for 9,155 MW against target of 7 GW
- 30% agriculture feeders (connected to 2,752 sub-stations) to be solarized by December 2025

MSKVY 2.0: Benefits for farmers, DISCOM, Environment and Government

Farmers

- Farmers to get reliable, daytime power supply at desired voltage level
- Compensation for land they want to sell for setting-up solar plant
- Earlier nighttime supply for pumps affected 'Ease-of-living' of farmers

DISCOM

- Reduction in AT & C losses due to generation near consumption point
- Reduction in power procurement cost (Average Rs 3.05/kWh)
- Meeting RPO targets (Distributed Renewables)

Environment

- Green Power for Agriculture – Reduction in Carbon footprint
- Reduced water consumption during day-time
- Reduction in man-animal encounters during nighttime

Government

- Reduction in subsidies to the tune of Rs. 10,000 Cr.
- Reduction in tariff for Industries & Commerce
- Investment and Employment Generation

Interventions required for success of MSKVY 2.0

Interventions Required for success of MSKVY 2.0

Viability Gap Funding

- MERC approved ceiling tariff for MSKVY is Rs 3.10/kWh
- Without VGF, tariff discovered was in range of Rs 4 to 4.10/kWh
- MNRE sanctioned 7.75 lakh pumps for providing CFA against 17.1 lakh pumps to be covered under first half of MSKVY 2.0

Distribution System Strengthening

- linking solar power with agricultural consumption means agricultural pumps would be served during daytime when system loading is already high
- Load flow studies have indicated that many sub-station and distribution lines would become overloaded during daytime.

Sub-Station Monitoring System

- reduce risks of Solar Power Developers and encourage them to participate they have been assured payment for deemed generation
- ensure that sub-station maximize their availability to reduce financial penalty
- monitor data of solar-plants commissioned under MSKVY (as per MNRE Guidelines)
- control power supply to agriculture feeders to integrate with infirm solar power

Battery Energy Solar System

- Agriculture consumption is not constant throughout the year
- This makes it imperative for DISCOM to store energy generated by solar plant
- Energy storage for distributed solar is also a useful tool to regulate backwards flow of power (to EHV S/Stn) and prevent overloading/tripping of transmission network

Distribution System Strengthening , Substation Monitoring and BESS

Benefits of System Augmentation

DISCOM

- Reduction in technical loss by reducing loading of existing distribution system
- Reduction in system downtime due to optimum loading of power network
- Avoid payment to solar power developer for deemed generation
- Reduction in maintenance expenses and improved operational efficiency for MSEDCL

Farmers

- Reliable and quality supply to increase productivity
- Less damage to motors of agricultural pumps
- Reduce reliance on costly diesel pumps

Environment

- Reduction in thermal generation due to low distribution losses
- Less pollution from diesel pumps
- Reduced water consumption

Design, supply, and installation of substation monitoring system

Installation of monitoring equipment

Integration of solar ABT meter with central server and LDMS

Development and roll out of ADMS



Setup of Central Control Centre

Monitor RMS data of each solar-plant at central server

Cloud-based central software for data acquisition

Integration of central software with MSEDCL's systems

BESS:

- Installation of
 - Solar PV project of capacity 20MW; and
 - 20MWh Lithium-ion BESS to supply 5MW schedulable power
- Pilot project designed to devise optimum strategy for distributed generation
- Supply-demand gap; and Cost of power from power exchange
- Potential for future replication



Social and Gender Inclusive design using RE



Solutions

1

Engaging the private sector to increase the capacity of distributed solar generation

2

Strengthening and modernizing the rural distribution network to enable RE integration

3

Skill development for green jobs and creating green entrepreneurial opportunities

Output 1: Inclusive RE development through private sector and green-energy ready rural grids enhanced

Output 2: RE integration and green transition through digitalized operations and gender-inclusive livelihoods achieved

Socio-economic barriers

Limited Community Involvement

Poor Rural Distribution Grids

Seasonal use and High Subsidy

To support **Power Sector Vision 2030** and meet the decarbonization targets, the **investment program aims to enable the implementation of agriculture solarization initiatives through a holistic approach** for the development of rural distributed solar initiatives.

1) Green Skilling and Green Jobs:

- **Council for Energy Transition and Green Skills.**
- **Skill development** of 5000 -7000 participants (of which at least 2000-3000 women) **to facilitate green jobs with solar power developers.**
- **Facilitation support** to at least 300 beneficiaries (of which at least 150 women) **to link with government programs to pursue green-energy livelihoods options.**
- Support 200 beneficiaries (of which at least 100 women) through **rural green entrepreneurship financial facility to pursue green-energy entrepreneurship options.**

Social and Gender benefits

The project is uniquely designed to **deliver holistic social benefits** to the farmers, agriculture dependent households and rural communities



Energy and Water security to enhance agriculture productivity of the farmers as better irrigation is supported through daytime reliable electricity supply.

~40,000 long term decent jobs created¹ for participation by local rural population for operations and maintenance of the installed solar projects.



Rural livelihoods & community development supported through Social benefit grant to the Gram Panchayats who can take up targeted rural upliftment projects in their areas.

¹ As per Skill Council for Green Jobs, an estimated 3.26 million cumulative jobs will be created due to estimated installed capacity of 940 GW. Based on this ~31,000 job creation is estimated for the MSKVY 2.0. Jobs created are long term and decent as the job participant will be involved in project operations for a long term period with “skilled” income levels.

Social and Gender benefits (2/2)

The project design also **ensures participation of women and youth** to pursue clean energy based agri linked livelihoods that together will derive synergies and **contribute to meeting India's NDC targets.**

skill development programs, to be supported through ADB assistance, to empower rural population (esp. youth and women) to pursue clean energy based agriculture linked livelihoods.



Participation of women in agriculture sector improved as daytime electricity is being provided to the farms.



Contributes to India's Nationally Determined Contributions (NDCs) and State's decarbonization targets.



Thank you

