The centralized grid as we understand currently will gradually transition from being main source of power supply to a flexible reserve for banking surplus energy from decentralized RE systems. C&I consumers will find decentralized renewable energy (DRE) solutions integrated with storage more competitive in the immediate future. Electric utilities across generation, transmission and distribution (GT&D) segments, will be on the front line bracing the impact of this transition. Turning disruption into growth opportunities, testing new and innovative business models, reforms and restructuring focusing on the clean energy transition must become key imperatives for the survival of electric utilities.

3 Promote third party owned business models for accelerated RTPV capacity addition in the domestic category

Under the Grid connected Rooftop Solar Program - phase 2 component A, most of the DISCOMs have largely adopted the consumer owned model with utility acting as an aggregator to implement the sanctioned RTPV capacity. Going forward, DISCOMs must look beyond consumer owned models to attract more households, especially in the lower slabs of consumption (less than 100 units per month).

Kerala State Electricity Board (KSEB) has successfully aggregated over 200 MW of RTPV demand from households in the lower slabs of consumption by offering compensation for access to roof space in the form of monthly energy credit. DISCOMs in other states must take a cue from this success and act fast to unlock value in the RTPV market. Perceived threats from revenue loss can be turned into a growth opportunity if DISCOMs channel their CAPEX into supplying RTPV electricity to individual households.

The Government of India through MNRE must initiate a massive capacity building program for DISCOMs in order to build capabilities for the delivery of new functionalities required for the RTPV market. Recognizing the future investment opportunities emerging from the transition, new service-oriented utility centric business models must be tested continuously.

The Grid connected Rooftop Solar Program could provide incentives NOT just for RTPV capacity addition but for making DISCOM's own investment / CAPEX toward promoting RTPV energy for residential consumers.

4 Promote contactless digital platforms for reducing transaction costs and enhancing consumer experience of ease of doing rooftop solar

Ease of doing rooftop solar at state level is one of the principal bottlenecks for achieving the 18 GW capacity addition target under MNRE Phase 2 scheme.

We believe the following factors determine the ease of doing rooftop solar along the project lifecycle and directly translates into transaction cost for all market participants including consumer, state nodal agency, vendor and financial institution.

- Consumer access to information about fundamentals of rooftop solar technology, vendors and products available in the market, total cost of ownership and benefits, subsidy availing process from state nodal agency, installation, operation and maintenance practices
- Consumer acquisition / demand aggregation – lead generation, consumer identification and professional site level assessment of rooftop solar system yield, size and cost etc.
- Consumer access to cost effective retail debt financing products equivalent to home loan products
- Vendor access to cost effective working capital loans
- Grant of net metering and grid interconnection for proposed rooftop solar systems from grid operators
- Enforcing post installation protocols for system performance monitoring, operation and maintenance

All of the above factors are largely managed with significant human intervention in most of the states. This entails a significant transaction cost (approx. INR 5,000–10,000 per consumer) for all the market participants, which is unaccounted for in the current MNRE benchmark costs for availing subsidy and other regulated cost frameworks.

In this scenario, contactless digital platforms can play a crucial role of seamlessly integrating these activities and reducing the overall transaction cost for market participants. The consumer experience of availing rooftop solar will significantly improve thereby unlocking huge value for next generation solutions and services from DISCOMs.

If we can consider a total of 45 DISCOMs in the country, the total cost for setting up contactless digital platforms can be approximately INR 45 crores. In contrast, the present transaction cost with human intervention is estimated INR ~500 crores for all market participants if we consider only the 4 GW target for the residential sector.

PM-KUSUM: 10 GW of decentralized grid connected renewable energy capacity addition under Component A

Introduction

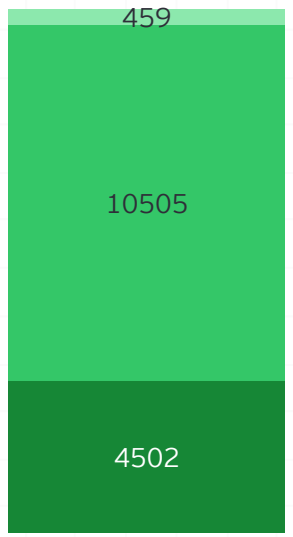
MNRE, Govt. of India, has notified the guidelines for implementation of 'PM-KUSUM' (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan) Scheme for implementation of DRE systems, solar agriculture water pumps and solarization of existing grid connected agriculture pumps. The scheme is structured under three separate components serving different market segments including but not limited to marginal farmers, landowning farmers and grid connected agriculture consumers.

The Component-A of the KUSUM supports setting up of 10 GW of decentralized ground mounted grid connected renewable energy power plants for providing additional source of income for land owning farmers. MNRE will provide procurement based incentive (PBI) to the DISCOMs @ 40 paise/kWh or Rs.6.60 lakhs/MW/year, whichever is lower, for buying renewable power under this scheme. The PBI will be given to the DISCOMs for a period of five years from the commercial operation date of the plant.

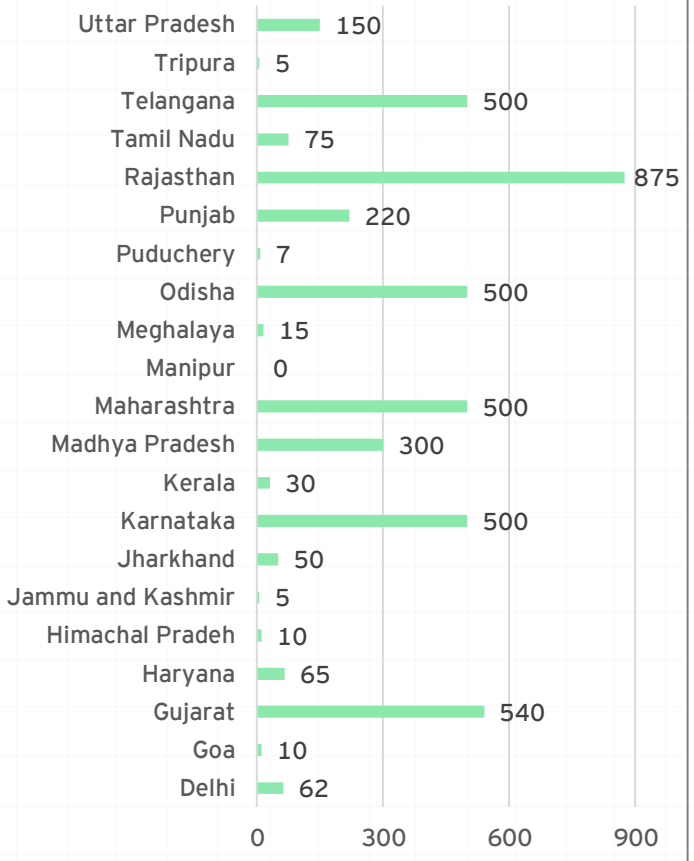
Shovel ready projects for implementation

4.4 GW capacity of decentralized ground mounted grid connected renewable energy power projects are currently sanctioned by MNRE to various state nodal agencies (mostly DISCOMs) for implementation under component A. A majority of these projects are still under development with nodal agencies inviting landowners/farmers, Solar EPC companies and developers to gauge their interest in project financing and development. Both CAPEX and OPEX models are allowed for maximum participation from stakeholders. Landowners are allowed to develop ground mounted grid connected Solar PV power projects on agriculture farmlands for dual use of power generation and farming.

Investment mobilization for sanctioned capacity (INR crores) – Component A



State wise sanctioned capacity in MW



Source: EY analysis from MNRE allocations to various states

Investment mobilization

In the prevailing conditions, we expect the program to spill over until 2022 post COVID. This is because the state nodal agencies for implementation (DISCOMs) would test and streamline the process for solicitation of market participants, capacity allocation, PPA execution, construction and commissioning, monitoring and evaluation before rapidly scaling up capacity addition. For the sanctioned capacity already under development, a total of INR 15,005 crores (US$ ~2 billion) of capital investment will be mobilized in 2020–21 from the landowners and other project developers. Further, another INR ~19,100 crores (US$ ~2.6 billion) is expected to be mobilized for building the remaining capacity announced under the program. Private sector funds will be largely utilized to meet this massive capital expenditure.

Capital Investment - Equity

~INR 10,230 crores

For 10 GW of ground mounted solar PV projects announced under KUSUM-A

Capital Investment - Debt

~INR 23,875 crores

For 10 GW of ground mounted solar PV projects announced under KUSUM-A

Item	2021	2022	Total
Annual Installed Capacity (GW)	4.4	5.6	**10**
Equity mobilization (INR crores)	4,500	5,730	**10,230**
Debt mobilization (INR crores)	10,505	13,370	**23,875**
Capital subsidy (INR crores)	460	585	**1,045**

Source: EY analysis

Socio economic benefits

~90,900 fresh jobs will be created in building 10 GW capacity of decentralized ground mounted grid connected renewable power projects announced under KUSUM component A. For the sanctioned capacity already under development, about ~40,000 jobs will be created in 2020–21. These jobs will emerge in rural areas with private sector investments along the value chain of project development, construction and commissioning, operations and maintenance of solar PV systems all across the country.

Source: EY analysis

Environmental benefits

Over ~400 million tonnes of CO2e emissions are expected to be avoided over the operating lifetime of 10 GW capacity of grid connected ground mounted solar PV projects commissioned under the program.

Fresh jobs created

~90,900 jobs

For 10 GW of ground mounted solar PV projects announced under KUSUM-A

Avoided emissions (cumulative over project lifetime)

~400 million tonnes CO_2e

For 10 GW of ground mounted solar PV projects announced under KUSUM-A

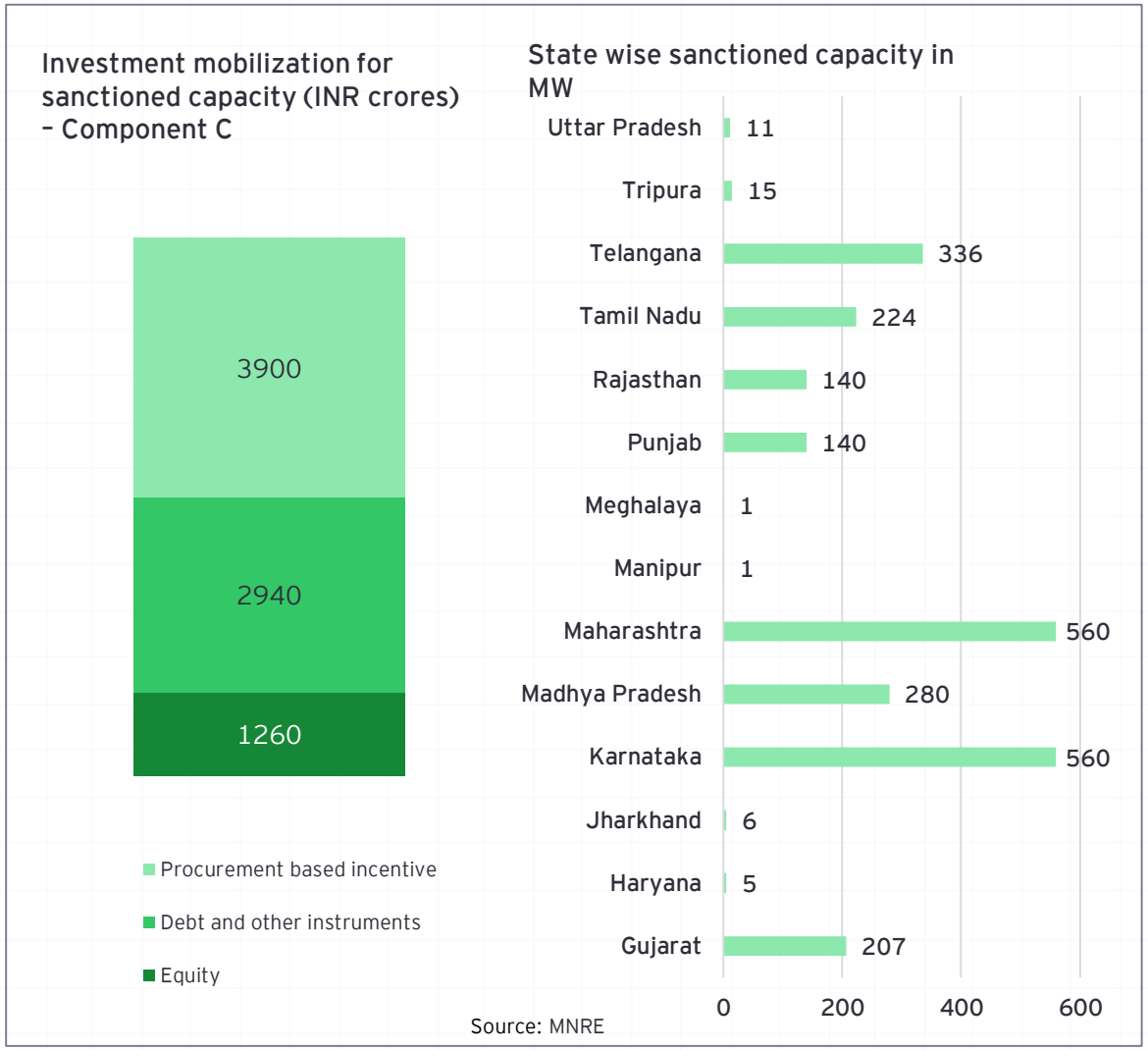
PM-KUSUM: 2.24 GW of decentralized grid connected renewable energy capacity addition under Component C

Introduction

MNRE, Govt. of India, has notified the guidelines for implementation of 'PM-KUSUM' scheme. Scheme is for implementation of DRE systems, solar agriculture water pumps and solarization of existing grid connected agriculture pumps. The Component-C of the KUSUM targets solarization of 4 lakh grid connected pumps by 2020–21. A total of 50% pumps are to be solarized as feeder level while remaining 50% shall be solarized as an individual pump solarization. The scheme supports setting up of 4.48 GW of decentralized ground mounted grid connected renewable energy power plants for providing additional source of income for land owning farmers. This component will be implemented initially on pilot mode for 2,484 MW capacity and later scaled up based on the learnings. MNRE will provide a Central Financial Assistance (CFA) of 30% of estimated cost for feeder level solarized pump, however an additional 30% state subsidy will be provided only for individual pump solarization. The feeder solarization capacity can be twice as much as the installed pump capacity. The estimated cost shall be worked out based on maximum agricultural pump capacity of 7.5 HP.

Shovel ready projects for implementation

2.48 GW capacity of decentralized ground mounted grid connected renewable energy power projects are currently sanctioned by MNRE to various state nodal agencies (mostly DISCOMs) for implementation under component C. A majority of these projects are still under development with nodal agencies inviting landowners/farmers, Solar EPC companies and developers to gauge their interest in project financing and development. Both CAPEX and OPEX models are allowed for maximum participation from stakeholders. Landowners are allowed to develop ground mounted grid connected Solar PV power projects on agriculture farmlands for dual use of power generation and farming.



Source: MNRE

Investment mobilization

In the prevailing conditions, we expect the program to spill over until 2022 post COVID. This is because the state nodal agencies for implementation (DISCOMs) would test and streamline the process for solicitation of market participants, capacity allocation, PPA execution, construction and commissioning, monitoring and evaluation before rapidly scaling up capacity addition. For the sanctioned capacity already under development, a total of INR 4,200 crores (US$ ~0.6 billion) of capital investment will be mobilized in 2020–21 from the landowners and other project developers. Further, another INR ~3,400 crores (US$ ~0.5 billion) is expected to be mobilized for building the remaining capacity announced under the KUSUM-C program. Private sector funds will be largely utilized to meet this massive capital expenditure.

Capital Investment - Equity

~INR 2,260 crores

For 4.48 GW of ground mounted solar PV projects announced under KUSUM-C

Capital Investment - Debt

~INR 5,340 crores

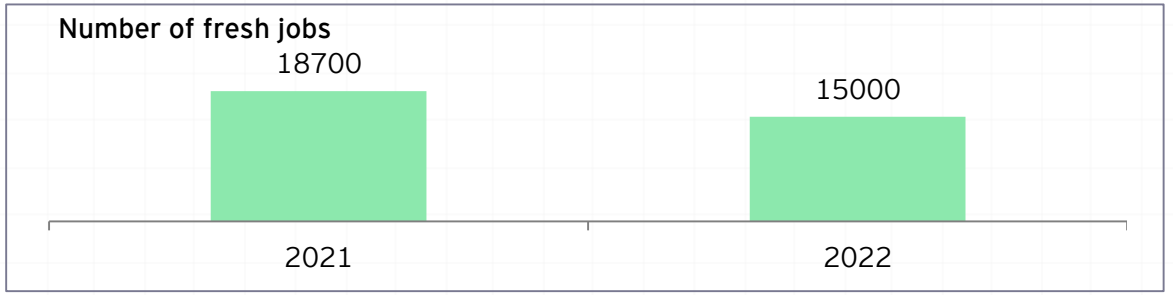
For 4.48 GW of ground mounted solar PV projects announced under KUSUM-C

Item	2021	2022	Total
Annual Installed Capacity (GW)	2.48	2	4.48
Equity mobilization (INR crores)	1,260	1,000	2,260
Debt mobilization (INR crores)	2,940	2,400	5,340
Capital subsidy (INR crores)	3,900	3,150	7,050

Source: EY analysis

Socio economic benefits

~33,700 fresh jobs will be created in building 4.48 GW capacity of decentralized ground mounted grid connected renewable power projects announced under KUSUM component C. For the sanctioned capacity already under development, about ~18,700 jobs will be created in 2020–21. These jobs will emerge in rural areas with private sector investments along the value chain of project development, construction and commissioning, operations and maintenance of solar PV systems all across the country.



Source: EY analysis

Environmental benefits

Over ~150 million tonnes of CO_2e emissions are expected to be avoided over the operating lifetime of 4.48 GW capacity of grid connected ground mounted solar PV projects commissioned under the program.

Fresh jobs created

~33,700 jobs

For 4.48 GW of ground mounted solar PV projects announced under KUSUM-C

Avoided emissions (cumulative over project lifetime)

~150 million tonnes CO_2e

For 4.48 GW of ground mounted solar PV projects announced under KUSUM-C