



Solarizing India's Irrigation: Can PM-KUSUM live up to its promise?

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PM-KUSUM

PM-KUSUM: The targets

Component-wise revised solar capacity and financial support is given below:

Component	Revised target	Solar capacity (GW)
A	10000 MW	10.0
B	20 lakh Pumps	9.6
C	15 lakh Pumps	11.2
Total		30.8

Year-wise revised target under the three components are as given below:

Year	Component-A (Commissioning target in MW)	Component-B (Sanction target in Nos.)	Component-C (Sanction target in Nos.)	
			Individual pump solarization	Feeder level solarization
2019-20	0	1,50,000	82,000	0
2020-21	500	5,50,000	1,18,000	2,00,000
2021-22	4,500	6,00,000	2,00,000	2,50,000
2022-23	5,000	7,00,000	3,50,000	3,00,000
Total	10,000	20,00,000	7,50,000	7,50,000

The progress so far

Component A

9 : States have made some progress
5 : Reached the tender stage
1 : Have issued LoA

Component B

7 lakh : Pumps tendered so far

Component C

10 : States have made some progress
5 : Reached the tender stage
1 : Have issued work orders



Deep-dive

Component A

Component A: On-ground views and challenges (1/2)

- **State-level coordination**

- Most States have discoms as the implementation agency. Punjab and Rajasthan are exceptions
- Inter-departmental coordination could be a cause of concern.
 - Pilots in Karnataka are delayed by up to 2 years – delay in approvals for land diversion and construction of evacuation infrastructure

- **Discoms' perspective**

- **Money matters:** Generally interested, if there's commercial viability
- **Long-term view:** Need integration with long-term planning
 - Maharashtra included feeder solarisation in its solar policy
 - States with excess contracted capacity are reluctant
- **RPOs are not doing the magic**
 - Many states are already fulfilling, looking at other pipeline
 - Difficulty in registering farmers' for RECs (AP and KN)

Component A: On-ground views and challenges (2/2)

- **Commercial viability**

- Most SERCs determining tariffs (LCOEs) inline with large-scale projects
 - Limited economies of scale, cost of dedicated evacuation bay, etc. are not particularly considered
 - In MSKVY, a ceiling tariff ₹3.1 fetched limited bids. Only 1,800/7,000 MW received bids

States	Notified ceiling tariff
Rajasthan	₹ 3.14
Telangana	₹ 3.13
Punjab	₹ 2.75
Odisha	₹ 3.08
Haryana	₹ 3.11
Jharkhand	₹ 3.09

- **Financing**

- **Farmers' finding it challenging to source equity:**
 - In Rajasthan, banks not accepting farm land as collateral
 - Karnataka worked around the issue by allowing SPVs by farmer and the developer

- **Component A vs C?**

- One may sabotage the other



Deep-dive

Component C

Component C: On-ground views and challenges (1/3)

- **The experience so far:**
 - States, which piloted solarisation of individual pumps, are not (bullish about) scaling-up
 - Karnataka – Surya Raitha scheme
 - Andhra Pradesh – Grid-connected BLDC project
 - Gujarat – SKY scheme
- **State-level coordination**
 - SNAs are the implementation agencies in many states, leading to coordination issues
 - Discom's operational concerns are not adequately addressed
 - Leading to multiple petitions and rejoinders in SERCs. e.g. Tamil Nadu, Punjab
- **Discoms' perspective**
 - Feeder solarisation is emerging as their favourite

Component C: On-ground views and challenges (2/3)

- **Commercial viability**

- Lack of farmers' interest in States with free and reliable power
 - Tamil Nadu: Zero farmer investment. SNA to own the asset. Incentive for farmer to conserve water.
 - Karnataka: At ₹1/unit tariff, farmers opted to sell water. Discoms unable to recover loan in stipulated period
- High infrastructure upgrade cost to discoms
 - Discoms with limited feeder segregation are not in a position to take-up additional loans (e.g. Chhattisgarh)
 - Gujarat: Retrofitting with 'Smart Energy Management' devices

- **Regulatory issues**

- SERCs recognize the importance of ensuring a remunerative FiT to the farmers, but lack of a standardised approach to arrive at the Feed-in-Tariff
 - Punjab calculated LCOE of ₹1.2 for farmer, then revised it to ₹2.6
 - Rajasthan fixed it ₹3.44 on the merit of supporting farmers

Component C: On-ground views and challenges (3/3)

- **Operational experience**
 - **Metering and billing:** logistics and trust issues
 - All pilot states experimented farmer groups.
 - Karnataka: Cooperatives are dysfunctional. Farmers are not paid yet.
 - Andhra Pradesh: 3 persons involved in meter reading (discom, cooperative, farmer). Not a scalable model.
 - **Free-riding:** non-participating farmers
 - Karnataka could not solve the problem. Unauthorised connections were rampant.
 - Gujarat using watchdog device.
 - Andhra Pradesh implemented only after 100% farmers agreed. Delayed the project for 2 years.
 - **Technology:**
 - Some states are struggling to meet the **must-run status** for 11 kV lines. Prone to tripping.
 - Network connectivity: Karnataka's experimented with a mini-SCADA system fell through.
 - **Securing land:** a challenge
 - In MSKVY, both the discom and developers found it difficult to get land near substations at viable price.

What can be done?

- **Get real**
 - **Make it demand-driven**
 - May not meet the target as per current timeline
 - **Engage discoms**
 - Create a forum for regular engagement and feedback
 - **Understand ‘incentives’**
 - For all parties involved: farmers, discoms, developers
 - **Iterate**
 - Continue making regular improvements
- **Look beyond targets**
 - Who is getting the support? Are pumps adequately sized?
 - Is the asset getting utilised? Is the irrigation access improving? Is the water getting conserved?

Thank you

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