

Uttar Pradesh Market Entry: A Guide to Supplying Government Solar Tenders

Educational analysis of entry-scale manufacturing opportunities for agricultural solar applications.

Redefining Industrial Stability: A Comprehensive Review of Integrated Turnkey Manufacturing Frameworks by J.v.G. Technology GmbH.





Analysis Framework

Created as part of the
PVKnowHow Knowledge
Network

Prepared by J.v.G.
Technology GmbH

European specialists in
proven turnkey solar
manufacturing concepts

Key Project Data

20-50MW

Factory Scale

Entry scale capacity

\$3-5M

Investment

USD (20 MW reference)

10-14

Ramp-up Period

Months to full production

- **Target market:** Government solar tenders (PM-KUSUM)
- **Line type:** Robust, climate-adapted module production
- **Certifications:** BIS required
- **Region:** Uttar Pradesh, India
- **Source:** PVKnowHow / European turnkey provider

Agricultural Power Deficit Context



Agricultural Dependency

Uttar Pradesh's economy is deeply intertwined with agriculture, with 47% of the population directly dependent on agriculture for livelihood.



Power Supply Crisis

Unreliable grid electricity forces millions of farmers to depend on expensive and polluting diesel-powered water pumps for irrigation due to erratic and inadequate power supply.



Government Response

The most significant and reliable driver is the government's PM-KUSUM scheme, which aims to solarize the state's massive agricultural sector.

PM-KUSUM Scheme Structure

01

Component A: Grid-Connected Plants

Setting up of 10,000 MW of Decentralized Ground/ Stilt Mounted Grid-Connected Solar or other Renewable Energy based Power Plants

02

Component B: Standalone Pumps

Installation of 14 Lakh Stand-alone Solar Agriculture Pumps - Primary market opportunity for manufacturers

03

Component C: Grid Pump Solarization

Solarisation of 35 Lakh Grid Connected Agriculture Pumps including Feeder Level Solarization

Solar Pump Demand Analysis

Market Scale

- Government target: 2.15 million new solar water pumps by 2026-27 fiscal year
- Current installation: Only around 58,000 pumps as of early 2024
- Enormous gap between current supply and official goal

Financial Support

- 30% cost coverage from central government
- Additional 30% from state government
- 60% subsidy makes transition highly attractive for farmers
- Creates reliable, high-volume market for module suppliers

Government Procurement Requirements

Tender Navigation

Successfully navigating the complex government tender process - Primary challenge for new manufacturers

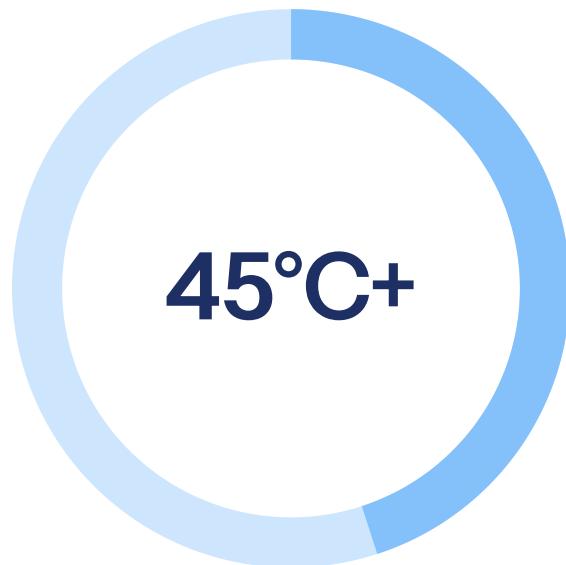
BIS Certification

Meeting mandatory BIS quality certifications - Essential compliance requirement

Performance Guarantees

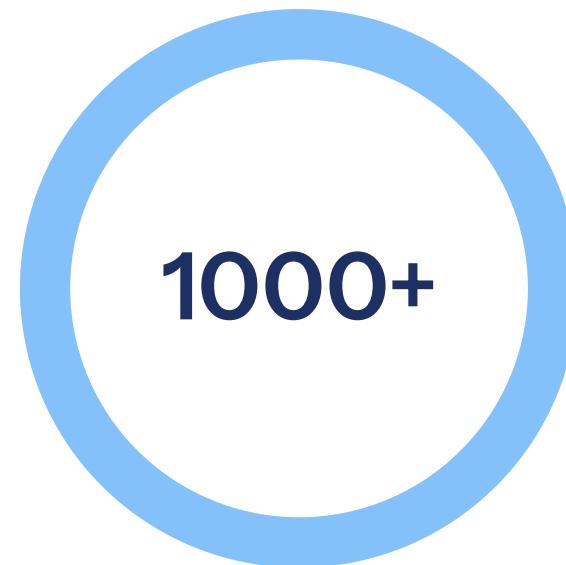
Producing modules that can withstand harsh North Indian climate for long-term performance guarantees

Climate-Driven Degradation Risks



Extreme Heat

North Indian summer temperatures
causing module stress



UV Radiation

W/m² peak irradiance levels requiring
robust materials



Performance Guarantee

Years required for government tender
compliance

Robust Module Technology Importance

Material Selection

UV-resistant backsheets

High-grade aluminum frames

Temperature-resilient cells

Climate Testing

Accelerated aging protocols

Thermal cycling validation

Humidity freeze testing

1

2

3

4

Manufacturing Quality

Proven turnkey manufacturing concept

European engineering standards

Automated quality control

Field Performance

25-year output guarantees

Minimal degradation rates

Agricultural environment durability

Local Manufacturing Advantages

1

Cost Competitiveness

Lower labor costs for manufacturing

Reduced import duties and tariffs

Proximity to end-user market

2

Supply Chain Benefits

Faster delivery to government projects

Local sourcing of basic components

Service network establishment

3

Policy Alignment

PLI scheme benefits for domestic manufacturers

Government preference for local production

Job creation in manufacturing sector

Strategic Market Entry Framework

Entry Scale Approach

- Small to medium-sized factory with 20–50 MW annual capacity is effective and manageable starting point, sufficient to compete for tenders
- Lower initial capital investment requirement
- Focus on quality over volume initially

Market Positioning

- Target Component B standalone pump market
- Build expertise in agricultural applications
- Develop government tender capabilities
- Scale based on proven demand

Investment Structure for Entry Scale



Capital Requirements

\$3-5M for 20-50 MW capacity

Proven turnkey equipment
platform



Risk Mitigation

Government-backed demand
through PM-KUSUM

Established subsidy framework



Scalability Path

Modular expansion based on
market success

Technology upgrade capability

Investor FAQs

Market Demand Risk

Clear and quantifiable demand for locally produced solar modules over coming years

Government-backed procurement through PM-KUSUM

Technical Requirements

Proven turnkey manufacturing concept from European specialist
Climate-adapted design for North Indian conditions

Financial Viability

Entry-scale 20-50 MW factory sufficient for tender competition without excessive capital investment

Strategic Conclusion

Analysis of entry-scale solar module manufacturing opportunity for PM-KUSUM market:

- Millions of farmers dependent on expensive diesel pumps due to unreliable grid power
- Government target of 2.15 million pumps with massive supply gap
- Robust module technology essential for harsh climate conditions
- Reliable, high-volume market through 60% government subsidies

 Proven turnkey manufacturing concept offers strategic entry into India's government-backed agricultural solar market

Source & Authorship

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