

Understanding India's ALMM: A Guide for New Solar Module Manufacturers

A Strategic Guide for New Solar Module Manufacturers

Content Partner: J. v. G. technology GmbH

Turnkey solar module production lines — since 1997

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Technical Overview: India's ALMM for New Solar Module Manufacturers



Created as part of the PVKnowHow Knowledge Network



Prepared by J.v.G. Technology GmbH



European specialists in turnkey solar module production lines

The Market Entry Problem

The Core Barrier

- India's solar market is among the largest and fastest-growing globally
- Government and large-scale projects represent the most stable demand segment
- Access to this segment is governed by a single regulatory gate: ALMM
- Without ALMM listing, a new factory is effectively excluded from the primary market

Why New Manufacturers Are at Risk

- ALMM compliance is not intuitive — it requires structured preparation from day one
- Many new entrants underestimate the timeline and documentation burden
- Delays in listing directly delay revenue generation
- Competitors already listed have a decisive first-mover advantage

What Is ALMM?

Definition

- ALMM = Approved List of Models and Manufacturers
- Maintained by India's Ministry of New and Renewable Energy (MNRE)
- List-I: approved solar PV module models and manufacturers
- List-II: approved solar PV cell manufacturers (recently introduced)
- Fully reinstated on April 1, 2024 — compliance is now mandatory

Regulatory Objective

- Reduce India's dependence on imported solar modules
- Promote domestic manufacturing under Atmanirbhar Bharat policy
- Ensure only quality-verified modules reach government-backed projects
- Physical factory inspection by NISE is a mandatory component

Why ALMM Is Critical for New Manufacturers

Market Access

- Mandatory for all government projects, schemes, and subsidized installations
- Applies to PM-KUSUM, solar parks, open-access tenders, and net-metering projects
- Non-listed modules cannot be procured for these segments — no exceptions

Bankability Signal

- ALMM listing is a recognized quality signal to project developers and financiers
- Unlisted manufacturers face higher scrutiny in private project procurement
- Lenders and EPCs increasingly treat ALMM as a baseline due-diligence criterion

Commercial Viability

- Failure to get listed severely limits a new factory's addressable market
- India targets 500 GW non-fossil capacity by 2030 — government projects dominate the pipeline
- Listing is the gateway to the most stable and high-volume demand segment

Market Access Limitations Without ALMM

Excluded Project Categories

- All central and state government-funded solar projects
- Projects under MNRE schemes and programmes
- Open-access and net-metering projects connected to government offtake
- Projects selling power under Section 63 of the Electricity Act, 2003

Competitive Displacement

- Listed competitors automatically capture tendered government demand
- Unlisted manufacturer cedes major market share by default
- Any project violating ALMM norms faces penalties and withheld approvals

Permitted Segments (Limited)

- Behind-the-meter captive projects without subsidy may use non-listed modules
- Private commercial/industrial rooftop without scheme obligation — limited exemption
- These segments represent a significantly smaller share of total market volume

Bankability & Credibility Impact

For Project Financing

- Banks and DFIs increasingly require ALMM-listed modules as a loan condition
- Non-listed modules introduce procurement risk that lenders price into terms
- ALMM listing reduces technology risk perception in project financial models
- Accelerates due diligence and credit approval timelines

For EPC & Developer Relationships

- EPCs working on government tenders cannot source from unlisted manufacturers
- ALMM listing is used as a pre-qualification criterion in large procurement tenders
- Listing signals factory is operational, inspected, and quality-verified
- Supports long-term supply agreements and repeat business relationships

Strategic Disadvantage Without ALMM

1

Delayed Revenue

Every month without ALMM listing is a month of foregone access to the highest-volume procurement segment

2

Market Share Loss

Listed competitors establish customer relationships and supply track records that are difficult to displace later

3

Investor Confidence Risk

Factory investors and lenders expect ALMM as a milestone — delays undermine the business case and project returns

- ❏ A proven turnkey manufacturing concept integrates ALMM readiness into factory planning from day one — reducing risk and accelerating listing timelines for new manufacturers.

Step-by-Step ALMM Process

- 1 — Step 1 — Obtain BIS Certification**

BIS (Bureau of Indian Standards) certification is the mandatory prerequisite

Modules must meet specified safety, performance, and minimum efficiency thresholds
- 2 — Step 2 — Prepare MNRE Application**

Submit online application to MNRE with full documentation package

Includes company registration, facility details, BIS certificates, and QC process reports
- 3 — Step 3 — NISE Factory Inspection**

National Institute of Solar Energy (NISE) conducts physical audit of manufacturing facility

Factory must be fully commissioned and in active production at time of inspection
- 4 — Step 4 — MNRE Approval**

MNRE reviews inspection findings and approves the application

Manufacturer and module models added to official ALMM List-I
- 5 — Step 5 — Listing Maintenance & Renewal**

Listing valid for approximately two years; renewal requires re-inspection

BIS certification must remain valid — expiry triggers automatic delisting

Factory Inspection: What NISE Audits

Manufacturing Equipment

- Quality and condition of production line machinery
- Equipment must match specifications declared in the MNRE application
- Capability to produce modules at declared annual capacity

Quality Systems

- In-process quality checks and laboratory testing capabilities
- Component traceability throughout the production cycle
- Maintenance of clear, well-documented production records

Production Readiness


- Factory must be fully operational – not a pilot or theoretical line
- Consistent production capability must be demonstrated during audit
- Module output must match BIS-certified model specifications

Documentation & Records

- Valid BIS registration for each module model under application
- Organized QC documentation – a well-documented system is critical for success
- Financial and legal company registration documentation

Timeline & Planning Considerations

Phase	Activity	Indicative Duration
BIS Certification	Module testing, application, and registration	2–4 months
MNRE Application Preparation	Documentation assembly and submission	4–8 weeks
NISE Inspection Scheduling	Awaiting audit appointment after submission	Variable
Inspection to Approval	MNRE review and official listing	Weeks to months
Total Realistic Timeline	From factory commissioning to ALMM listing	~6–9 months

 Any delay in ALMM approval directly translates to a delay in revenue from the primary market segment. Build this timeline into the factory business plan from the outset.

Investment in Quality Systems

Quality Over Cost-Cutting

- The ALMM process is fundamentally a quality audit
- Cutting corners on machinery or testing equipment is a false economy
- Investing in a robust production line is a prerequisite — not an option

Laboratory & Testing Capability

- In-house testing lab strengthens NISE audit outcome
- Electroluminescence (EL), flash testing, and peel force testing are key
- Traceability systems for raw materials and finished modules are expected

Process Documentation

- Well-maintained production records are critical for audit success
- SOP documentation for each manufacturing step supports consistent output
- QMS alignment with BIS and IEC standards reduces re-inspection risk

Key Project Data

100–5...

Factory Scale

Typical capacity range for new greenfield module manufacturing facilities

BIS + A...

Certification Required

Both certifications are mandatory to access government and large-scale project markets

~6–9 Mo

Approval Timeline

Realistic end-to-end timeline from factory commissioning to ALMM listing

NISE

Inspection Body

National Institute of Solar Energy conducts the mandatory factory audit under MNRE

📄 Market: India (government + large-scale projects) · Process: ALMM List-I (PV Modules) · Source: PVKnowHow / J.v.G. Technology GmbH

FAQ Highlights

Is ALMM mandatory for all solar projects?

- Mandatory for all government-funded, subsidized, and scheme-based projects
- Applies to open-access and net-metering projects under government offtake
- Behind-the-meter captive projects without subsidy may be exempt

Can a foreign manufacturer apply for ALMM?

- As of current policy, ALMM List-I is restricted to domestic manufacturers
- Foreign entities must establish a manufacturing presence in India to qualify
- This makes a turnkey factory setup in India the only viable route to listing

What happens if BIS certification expires?

- Expired BIS registration triggers automatic delisting from ALMM
- Manufacturers must proactively manage renewal timelines
- Re-listing after delisting may require a new inspection cycle

Strategic Conclusion

1 ALMM is not optional – it is the primary market access condition for India

Plan for it from day one of factory development, not as an afterthought

2 Quality investment drives NISE audit success

A robust production line and documented QMS are the most reliable path to approval

3 Timeline discipline protects business case integrity

A realistic 6–9 month ALMM timeline must be embedded in the investor plan

4 Experienced turnkey partners reduce execution risk significantly

A proven turnkey manufacturing concept delivers factory readiness aligned with NISE audit requirements

✔ Source: PVKnowHow / J.v.G. Technology GmbH – An experienced European turnkey provider for solar module manufacturing lines since 1997.

About the Content Partner

J. v. G. technology GmbH – The DESERT Company

Founded in 1997 in Bavaria, Germany. Family-owned engineering company specializing in turnkey solar module production lines.

More than 90 factory projects delivered worldwide.

On-site team training included – no prior manufacturing experience required.

Key areas:

Turnkey PV manufacturing lines | DESERT Technology® |
TÜV-certified module designs | Factory planning to production

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