

# Raw Material Supply for Solar Manufacturing in Indonesia: A Strategic Comparison of Importing vs. Local Sourcing

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Content Partner: J. v. G. technology GmbH

*Turnkey solar module production lines — since 1997*

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# Technical Overview: Importing vs. Local Raw Materials for Indonesian Solar Manufacturing



Created as part of the PVKnowHow Knowledge Network



Prepared by J.v.G. Technology GmbH



European specialists in turnkey solar module production lines

# Key Project Data

**50 MW**

## Project Scale

Reference capacity for this strategic comparison

**~\$25M**

## Estimated Investment

Typical capex range for a semi-automated 50 MW turnkey line

**2 Types**

## Line Configuration

Semi-automated (Phase 1) and fully automated (Phase 2)

**12–18 ...**

## Ramp-Up Period

Estimated time from commissioning to full production capacity

 Region: Indonesia · Line Type: Semi-automated / Automated · Source: PVKnowHow / J.v.G. Technology GmbH

# The Core Strategic Question

## Import Strategy

- Source all key raw materials internationally
- Access lowest global spot prices (primarily from Asia)
- High dependency on supply chain continuity
- Simpler procurement — established vendor networks
- Risk: TKDN non-compliance, import duties, logistics costs

## Local Sourcing Strategy

- Procure components from Indonesian domestic suppliers
- Supports TKDN compliance and market access eligibility
- Stronger supply chain resilience and shorter lead times
- Higher unit cost for some components vs. global benchmarks
- Risk: quality consistency and supplier maturity

# TKDN Policy: The Regulatory Framework

## What Is TKDN?

- Tingkat Komponen Dalam Negeri – Indonesia's Local Content Requirement (LCR)
- Mandatory for participation in government-sponsored solar projects and PLN tenders
- Calculated on a cost-based methodology: materials + local labor + production overhead

## Historical Thresholds

- Previous requirement: up to 60% TKDN for solar modules (rooftop) / 40% (ground-mount)
- 2024 relaxation: minimum threshold reduced to 20% under MEMR Regulation 11/2024
- Temporary relaxation: applies to projects with PPAs signed by end of 2024, COD by June 2026

## Strategic Implication

- TKDN compliance is not optional – it determines market access
- Non-compliant manufacturers are excluded from public tenders and PLN contracts
- Compliance converts a regulatory burden into a defensible competitive position

# Raw Material Categories: Import vs. Local Availability

Component	Import Availability	Local Availability (ID)	TKDN Impact
Solar Cells (c-Si)	High – global supply (primarily Asia)	Very limited domestically	Counts as foreign content
Tempered Glass (low-iron)	Available, competitive price	Growing local capacity	Local sourcing boosts TKDN
Aluminum Frame	Widely imported	Local suppliers available	Significant TKDN contributor
EVA Encapsulant	Standard import (Asia)	Limited local production	Mostly foreign content
Backsheet	Standard import	Not produced locally at scale	Foreign content
Junction Box / Cable	Available globally	Local options exist	TKDN compliance lever

❑ Key insight: Solar cells – the highest-value input – remain largely imported. TKDN strategy must maximize local content in all other components to compensate.

# Cost Structure: Imported vs. Locally Sourced Materials

## Landed Cost — Import Scenario

- Global spot price + sea freight + port handling
- Import duties (0–12% depending on HS code and origin)
- Currency exposure (USD-denominated supply chain)
- Lead time: 6–14 weeks from order to factory
- Inventory buffer required — increases working capital

## Landed Cost — Local Sourcing

- Domestic pricing — may carry a 5–20% premium vs. imports for some components
- No import duties; reduced logistics exposure
- IDR-denominated: natural hedge against currency fluctuation
- Lead time: 1–3 weeks — lower buffer stock needed
- Supports TKDN score — indirect commercial value

## Total Cost of Supply Chain

- Import scenario may appear cheaper at unit level
- Full landed cost analysis must include: duties, forex, working capital, TKDN penalty (market exclusion)
- Local sourcing premium often justified by market access value


# Supply Chain Resilience: Risk Comparison

## Import-Dependent Risks

- Geopolitical disruptions — port closures, trade conflicts
- Global logistics volatility (freight rates, container shortages)
- Single-source dependency on key upstream suppliers
- Extended lead times reduce production flexibility
- Exchange rate exposure on USD-denominated materials

## Local Sourcing Strengths

- Shorter, more controllable supply chain
- Lower exposure to global logistics disruptions
- Better supplier relationship management possible
- Faster response to demand fluctuations
- Supports regulatory resilience (TKDN buffer)

 Challenge: Local supplier quality consistency and volume scalability remain key risks. Rigorous incoming quality control (IQC) is non-negotiable.

# Hybrid Sourcing Strategy: A Two-Phase Approach

1

## Phase 1 — Market Entry (Import-Led)

Import high-value / locally unavailable inputs: cells, EVA, backsheet

Establish factory operations; qualify product with PLN under temporary TKDN relaxation

Begin local supplier development for frames, glass, junction boxes

2

## Phase 2 — TKDN Optimization (Hybrid)

Shift eligible components (frame, glass, J-box, cable) to qualified local suppliers

Maximize local labor and overhead contribution to TKDN score

Target  $\geq 40\%$  TKDN for sustained access to government and PLN tenders

3

## Phase 3 — Full Compliance (Strategic Position)

Certified TKDN-compliant manufacturer — protected market segment

Transition to fully automated line to reduce cost/module at scale

Explore local cell sourcing as Indonesian upstream capacity develops

# TKDN Compliance as a Competitive Lever

1

## Market Access Gate

TKDN compliance is the entry requirement for PLN tenders and government-backed solar projects — non-compliance means exclusion

2

## Protected Segment

Compliant manufacturers do not compete directly with low-cost imports in public procurement — they operate in a protected, higher-value market segment

3

## Strategic Positioning

A TKDN-compliant factory signals national industrial commitment — building credibility with government, PLN, and private-sector clients

- ❏ A proven turnkey manufacturing concept integrates TKDN strategy into production line design from Day 1 — reducing compliance risk for new manufacturers entering the Indonesian market.

# Semi-Automated vs. Fully Automated Line: Decision Framework

Criterion	Semi-Automated (Phase 1)	Fully Automated (Phase 2)
Capex	Lower upfront investment	Higher capex — justified at volume
Throughput	~100–300 modules/hour	Up to ~600 modules/hour
TKDN — Labor	Higher local labor content → TKDN benefit	Lower labor cost, reduced TKDN contribution
Best Suited For	Market entry; TKDN qualification; ramp-up	Scale-up phase; cost optimization
Cost/Module	Higher at volume due to labor intensity	Lower at scale — strong unit economics
Strategic Fit	Phase 1: compliance and market access	Phase 2: volume and profitability

# Strategic Recommendations

## Start Hybrid

- Import cells and critical encapsulants in Phase 1
- Source frames, glass, and J-boxes locally from Day 1
- Use local labor and overhead to build TKDN score

## Certify Early

- Engage PTSI or Sucofindo for TKDN audit immediately after commissioning
- PLN certification is a parallel track — plan 6–9 months ahead
- TKDN certificate is the primary commercial asset

## Scale Strategically

- Semi-automated entry → fully automated at 100+ MW/yr volume
- Renegotiate local supply contracts as volume grows
- Target government and PLN tenders as primary offtake channel

# 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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