

Feasibility Study: Launching a Small-Scale Solar Plant in Indonesia for Off-Grid Electrification

Expert assessment of turnkey manufacturing opportunities for institutional investors seeking infrastructure-style renewable energy investments with local content compliance.

Transforming Turnkey Solutions: In-Depth Framework Investigations and Comparative Operational Analytics from 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
turnkey solar module
production lines

Indonesia's Renewable Energy Investment Context

Indonesia's installed solar energy capacity had only reached 0.7 GW until August 2024, of its total potential of up to 3,200 GW. Solar PV globally dominates renewable energy contributions, reaching 73% of total installed renewable energy capacity by 2023.



Manufacturing Growth Opportunity

Massive gap between potential and current installation creates substantial manufacturing demand



TKDN Compliance Strategy

Meeting the TKDN threshold is the fundamental requirement for participating in government-backed projects



Strategic Market Position

Protected market access for manufacturers meeting local content requirements

Why Local Content Requirements Matter



Market Access Protection

TKDN creates a separate, protected market segment inaccessible to standard importers



Industrial Development

Reduces reliance on imports, creates skilled jobs, and fosters robust domestic manufacturing ecosystem



Government Project Access

Compliance with TKDN requirements must be verified by independent entity. Failure to comply may lead to administrative sanctions.

TKDN Definition and Calculation

TKDN (Tingkat Komponen Dalam Negeri) is a measure of the local components used in producing goods, services, or a combination of both. The calculation is managed by the Indonesian Ministry of Industry.

Materials Component

- Value of components sourced from Indonesian suppliers
- Aluminum frames, glass, junction boxes
- Imported components are foreign content

Labor & Overhead

- Cost of local workforce in assembly and production
- Factory operational costs within Indonesia
- Direct and indirect production expenses

Strategic Bill of Materials for TKDN Compliance

Local Components (High TKDN Value)

- Aluminum Frames: Domestic aluminum extrusion industry capability
- Solar Glass: Local tempered, low-iron glass manufacturers
- Junction Boxes & Cables: Growing local supplier base
- Packaging Materials: Readily available locally

Imported Components (Foreign Content)

- Solar Cells: High-efficiency cells from international suppliers
- EVA encapsulant materials
- Backsheet materials from established suppliers
- Specialized polymer films for module quality

Factory Configuration: Semi-Automated Production Line

Production Line Design

Turnkey manufacturing line optimized for TKDN compliance with quality control systems

Location Strategy

Site near Jakarta, Java, for logistical advantages and skilled labor pool access

Supply Chain Integration

Comprehensive supplier audit to identify and qualify Indonesian component providers

Certification Readiness

Independent certification process managed by entities like PT Surveyor Indonesia



Investment & Implementation Requirements

1

Infrastructure Development

- Factory site preparation and utilities
- Building construction and facility setup
- Initial workforce recruitment

2

Technology Transfer Implementation

- Experienced European turnkey provider equipment installation
- Comprehensive technical training programs
- TKDN compliance systems integration

Certification Process

TKDN Certification Steps

- Independent entity verification of TKDN requirements
- Detailed audit of manufacturing process
- Documentation of local supply chain costs
- Verification of claimed TKDN percentage

PLN Market Access

- Official PLN certification for government projects
- Product performance testing and verification
- International standards compliance
- Administrative sanctions for non-compliance

Timeline to Market

Months 1-3: Foundation

Site preparation, regulatory compliance, local supplier identification

Months 4-8: Installation

Turnkey line installation, technical training, quality systems implementation

Months 9-12: Ramp-up

Production optimization, TKDN certification process, autonomous operation transition

Months 12+: Certification

PLN certification completion and full market access

Key Project Data

20-50

Scale

MW per year production capacity

<12

Ramp-up

Months to autonomous operation

3-5M

Investment

USD typical small-scale line

Line Type

Semi-automated turnkey
manufacturing

Region

Indonesia

Source

PVKnowHow / European turnkey
provider analysis

Competitive Positioning

Protected Market Access

TKDN regulation creates protected market for compliant manufacturers

Supply Chain Advantage

Building resilient, domestic-focused manufacturing ecosystem

Technology Leadership

European technical standards with proven implementation methodology

Regulatory Compliance

Recent policy relaxations benefit manufacturers with investment commitment to locally produce by 2025

Source & Authorship

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Turnkey Solar Module Production Lines

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