

# Business Case: A Solar Module Factory in Sumatra for the Palm Oil and Rubber Industries

A comprehensive assessment of turnkey manufacturing opportunities addressing energy challenges in Sumatra's palm oil and rubber plantations through local solar production.

Advancing the Turnkey Blueprint: Holistic Framework Analysis and Multi-Year Operational Analytics from J.v.G. Technology GmbH.





# Analysis Framework

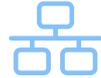
Created as part of the  
PVKnowHow Knowledge  
Network

Prepared by J.v.G.  
Technology GmbH

European specialists in  
turnkey solar module  
production lines



**Strategic analysis for captive solar manufacturing in remote agribusiness regions**



Created as part of the PVKnowHow Knowledge Network



Prepared by an experienced European turnkey provider

Specialists in semi-automated solar module production lines

# Energy Challenges in Remote Agribusiness

Palm oil and rubber plantations in Sumatra face critical energy security challenges. Remote locations lack reliable grid connections, creating dependence on costly diesel generators and exposing operations to fuel supply disruptions.



## Diesel Dependency Crisis

Remote plantations rely entirely on diesel generators, creating operational vulnerability and escalating energy costs in isolated locations



## Grid Instability Issues

Unreliable electrical infrastructure leaves agribusiness operations exposed to frequent power interruptions affecting processing schedules



## Supply Chain Vulnerability

Remote locations face logistical challenges in fuel delivery, creating operational risks during weather disruptions or supply shortages

# Strategic Rationale for Local Solar Manufacturing



## Captive Market Protection

TKDN creates a separate, protected market segment inaccessible to standard importers, offering unique opportunities for plantation-focused manufacturers



## Industrial Development

TKDN reduces reliance on imports, creates skilled jobs, and fosters robust domestic manufacturing ecosystems in agricultural regions



## Government Project Access

Participation in most government-sponsored projects hinges on manufacturers meeting minimum 40% TKDN for ground-mounted solar power plants

# Market Demand from Plantations and Mills

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 and uses a cost-based approach.

## Materials Component

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

## Labor & Overhead

- Cost of the local workforce involved in assembly and production contributes significantly to TKDN value
- Factory operational costs incurred within Indonesia
- Direct and indirect production expenses

# Factory Scale and Setup Logic

## Local Components (High TKDN Value)

- Aluminum Frames: Indonesia has a domestic aluminum extrusion industry capable of producing high-quality frames
- Solar Glass: Local glass manufacturers can supply tempered, low-iron glass
- Junction Boxes & Cables: Growing number of local suppliers
- Packaging Materials: Cartons, corner pieces, and pallets readily available locally

## Imported Components (Foreign Content)

- Solar Cells: Currently, high-efficiency solar cells are predominantly manufactured abroad. Importing them is standard practice
- EVA (Ethylene Vinyl Acetate) encapsulant
- Backsheet materials from international suppliers
- Specialized polymer films for module quality

# Financial and Operational Benefits

## Semi-Automated Production Line

Turnkey manufacturing line optimized for TKDN compliance with quality control systems and certification readiness

## Location Strategy

Site near Jakarta, Java, recommended for logistical advantages, including proximity to major ports and access to skilled labor pool

## Supply Chain Integration

Comprehensive supplier audit to identify and qualify Indonesian providers of aluminum frames, solar glass, junction boxes, and packaging materials

## Certification Readiness

Certification process managed by independent bodies like PT Surveyor Indonesia (PTSI) conducting thorough audit of production facility



# Risk Mitigation Through Captive Industrial Demand

1

## Infrastructure Development

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

2

## Technology Transfer Implementation

- An experienced European turnkey provider delivers equipment installation
- Comprehensive technical training programs
- TKDN compliance systems and local supplier integration

# FAQ Highlights

## TKDN Certification Steps

- Compliance with TKDN requirements must be verified by an independent entity. Results submitted to DGNRE
- Detailed audit of manufacturing process and cost structure
- Documentation of local supply chain and labor costs
- Verification of claimed TKDN percentage accuracy

## PLN Market Access

- Securing official PLN certification qualifies products for government projects through rigorous technical audits
- Product performance testing and quality verification
- Compliance with international standards
- Administrative sanctions apply for non-compliance

# Implementation Timeline

## Months 1-3: Foundation

Site preparation, regulatory compliance, and initial local supplier identification and qualification process

## Months 4-8: Installation

Turnkey line installation, comprehensive technical training programs, and quality systems implementation

## Months 9-12: Ramp-up

Production optimization, TKDN certification process, and transition to autonomous operation with ongoing support

## Months 12+: Certification

PLN certification process completion and full market access for government and private sector projects

# Competitive Positioning

## Protected Market Access

TKDN regulation creates a protected market for producers who can successfully navigate local sourcing and manufacturing complexities

## Supply Chain Advantage

Building a resilient, domestic-focused manufacturing ecosystem presents both challenge and opportunity

## Technology Leadership

European technical standards and quality systems with proven turnkey implementation methodology

## Regulatory Compliance

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

# Key Project Data

## MW

Capacity

Annual manufacturing output

**Line Type**

Semi-automated / automated  
turnkey manufacturing line

## Months

Ramp-up

Training to autonomous operation

**Region**

Sumatra, Indonesia

## Million

Investment

Typical for this scale

**Application**

Palm oil & rubber agribusiness

**Source:** PVKnowHow / An experienced European turnkey provider

# Strategic Conclusion

## Market Opportunity

Remote agribusiness energy challenges create substantial demand for local solar manufacturing addressing diesel dependency

## Protected Market Access

TKDN compliance creates sustainable competitive advantage with proven turnkey manufacturing reducing technology and operational risks

## Operational Excellence

Proven methodology enables autonomous operation within 12 months with comprehensive training and ongoing support framework

# Source & Authorship

J.v.G. Technology GmbH

Turnkey Solar Module Production Lines

PVKnowHow Knowledge Network

Website: [www.jvg-thoma.com](http://www.jvg-thoma.com)

Email: [info@jvgthoma.de](mailto:info@jvgthoma.de)

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