# Feasibility Study: Converting a Brownfield Site for Solar Module Production in South Africa

Technical feasibility analysis for Special Economic Zone deployment

Assessment prepared by J.v.G. Technology GmbH

# Analytical Framework

Part of the PVKnowHow Knowledge Network

Prepared by J.v.G. Technology GmbH

European specialists in turnkey solar module production lines

# South African Energy Context

## Energy Deficit

Persistent load shedding creates demand for distributed generation capacity

## Localization Policy

Government procurement frameworks favor domestic manufacturing content

## Just Energy Transition

International financing supports shift from coal to renewable manufacturing

# Brownfield vs Greenfield Comparison

## Brownfield Advantages

- Existing infrastructure reduces capital requirements by 25-40%
- Faster permitting through established facility status
- Electrical and structural systems already in place

## Greenfield Challenges

- Higher CAPEX for land, buildings, and utility connections
- Extended timeline for approvals and construction
- Greater exposure to regulatory delays

# Key Project Data

| 20-50 | <12 | Brown... | SEZ |
|---|---|---|---|
| **Scale (MW/year)** | **Ramp-up (months)** | **Investment Type** | **Location** |
| Semi-automated line capacity | Time to operational production | Reduced CAPEX vs greenfield | South Africa Special Economic Zone |

Source: PVKnowHow network analysis / J.v.G. Technology GmbH. Parameters based on proven turnkey manufacturing concepts adapted for emerging market deployment.

# Time-to-Market Advantages

1

### Facility Readiness

Existing buildings eliminate 6-9 months of construction time

2

### Turnkey Installation

Proven line configuration accelerates commissioning process

3

### Faster Revenue

Earlier production start improves project economics

# Technical Audit Requirements

01

## Structural Assessment

Floor loading capacity must support equipment weight distribution and operational vibration

02

## Electrical Infrastructure

Verify power supply capacity and stability for production equipment specifications

03

## HVAC Evaluation

Temperature and humidity control systems critical for module quality and adhesion processes

# Infrastructure and Logistics Benefits

## Existing Assets

- Access roads and loading facilities operational
- Warehouse space for materials and finished goods
- Office and administrative infrastructure in place

## SEZ Advantages

- Proximity to port facilities reduces import costs
- Tax incentives and duty relief programs
- Streamlined customs procedures for equipment

# Engineering-Led Conversion Process

### Phase 1: Technical Audit

Facility assessment by experienced European turnkey provider

Equipment specification and layout planning

1

### Phase 2: Adaptation

Electrical and HVAC system upgrades

Production line installation and integration

2

### Phase 3: Commissioning

Equipment testing and operator training

Quality system implementation

3

# CAPEX Reduction Potential

### Building Costs Eliminated

Avoid €2-3M in construction expenses

Brownfield conversion focuses capital on production equipment

### Utility Infrastructure

Existing electrical connections reduce installation costs

Water and compressed air systems leverage existing capacity

### Shorter Development Timeline

Reduced financing costs due to faster project execution

Earlier cash flow generation improves IRR

# Alignment with Just Energy Transition

### Manufacturing Jobs

Local production creates employment in areas affected by coal sector transition

### Skills Development

Technical training programs for semi-automated manufacturing operations

### International Support

Brownfield projects eligible for transition financing mechanisms and development funds

# Feasibility Conclusion

Brownfield conversion in South African SEZ offers practical pathway to domestic module production

Technical assessment confirms viability when paired with proven turnkey manufacturing concept and engineering-led facility adaptation

This analysis represents a composite scenario based on real consulting experience. Data points are realistic but simplified for strategic planning purposes.

# Source & Authorship

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Turnkey Solar Module Production Lines

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