

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

Scale (MW/year)

Semi-automated line
capacity

<12

Ramp-up (months)

Time to operational
production

Brown...

Investment Type

Reduced CAPEX vs
greenfield

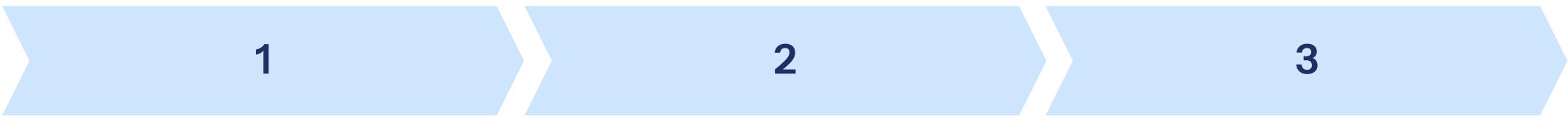
SEZ

Location

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

Phase 3: Commissioning

Equipment testing and operator training
Quality system implementation

1

2

3

Phase 2: Adaptation

Electrical and HVAC system upgrades

Production line installation and integration

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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