Establishing a Specialized Bifacial Solar Module Production Line in Ma’an: A Turnkey Solution by a Specialized EU Engineering Partner for Jordan’s Utility-Scale Solar Parks

Technical analysis of a specialized bifacial solar module production facility designed for Middle Eastern market conditions.

Educational case study based on turnkey manufacturing concepts - Source: J.v.G. Technology GmbH.

Technical case study for Middle Eastern solar manufacturing

Created as part of the PVKnowHow Knowledge Network

Prepared by J.v.G. Technology GmbH

An experienced European turnkey engineering partner

Jordan Manufacturing Context

The Ma'an Development Area was specifically designed as a hub for renewable energy and energy-intensive industries, offering cost-leadership advantages for MENA/Europe markets. This location presents a strategic business case for establishing specialized solar module manufacturing focused on high-performance bifacial modules, designed to be commercially viable while aligning with Jordan's national energy goals.

Industrial Infrastructure

Specialized electricity tariff of JOD 0.075 per kilowatt-hour for energy-intensive industries

Technical Advantage

Desert albedo of 30-40% enables high reflectivity for bifacial module optimization

Skilled Workforce

Local projects demonstrate capacity for technical training with 40,000 man-hours workforce development

Bifacial Technology Advantages

Enhanced Performance

Captures light from both front and rear surfaces, utilizing direct sunlight and ground-reflected energy

Regional Optimization

10-25% energy yield increase compared to monofacial modules in high-albedo environments

Market Position

Local production of specialized modules offers technically superior products for regional solar development

Manufacturing Specifications

Technical Capabilities

- Bifacial solar module assembly
- Semi-automated production line
- International quality standards

Production Systems

- Cell stringer, laminator, framing equipment
- Electroluminescence testing systems
- Final classification equipment
- Quality control procedures

Implementation Challenges

Technical Requirements

- Specialized equipment procurement
- International certification processes
- Quality system implementation

Infrastructure Development

- Production facility construction
- Utility connections and setup
- Supply chain establishment

Operational Setup

- Workforce training programs
- Process optimization
- Market development

Turnkey Partnership Benefits

Technology Integration

Proven manufacturing processes and equipment specifications from experienced providers

Technical Training

Comprehensive workforce development programs delivered by specialized engineering partners

Operational Support

Technical assistance throughout commissioning and ramp-up to autonomous operation

Quality Assurance

International certification and compliance systems for global market requirements

Implementation Framework

1

Project Initiation

- Manufacturing equipment specification
- Facility design and engineering
- Regulatory approval processes

2

Construction and Commissioning

- A proven turnkey manufacturing concept delivery
- Equipment installation and testing
- Production optimization and certification

Investment Structure

Technology Provider Scope

- Equipment design and procurement: 60-70% of investment
- Technical training and certification
- Production process optimization
- Quality management systems

Local Development Requirements

- Facility construction: 20-30% of investment
- Infrastructure connections
- Regulatory compliance management
- Local workforce recruitment

Technical Methodology

Structured Implementation

A specialized EU turnkey provider delivers standardized equipment installation and process optimization

Production Training

Hands-on technical training with specialized bifacial module manufacturing equipment

Quality Certification

International standards compliance and product certification for regional markets

Continuous Development

Technology updates and process improvements for manufacturing efficiency

Key Project Data

50-100

Production Capacity

MW per year output

12-18

Ramp-up Period

Months to autonomous operation

5-10

Investment Range

USD million total project cost

Product Focus

Bifacial solar modules

Line Type

Semi-automated manufacturing

Region

Ma'an, Jordan

Source: PVKnowHow / J.v.G. Technology GmbH

Strategic Implementation Considerations

Market Development

Manufacturing facility establishment aligns with Jordan's Vision 2025 renewable energy targets

Technical Capabilities

Local manufacturing enables modules engineered for regional conditions while reducing supply chain risks

Economic Impact

Strategic location choice impacts fundamental cost drivers and competitive positioning

Knowledge Transfer

Turnkey solutions include on-ground support for navigating administrative processes and setup acceleration

Technical Framework Summary

Manufacturing Capability

Specialized bifacial module factory represents convergence of technological opportunity and market demand, creating sophisticated industrial asset

Partnership Structure

Expert guidance and structured turnkey approach provides actionable blueprint for manufacturing implementation

Implementation Timeline

A proven turnkey manufacturing concept enables structured production setup within specified ramp-up period

Source & Authorship

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Turnkey Solar Module Production Lines

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