# Investment Analysis: Building a 500 MW+ Solar Module Plant in Algeria for Export

Analysis of turnkey solar module production deployment for agricultural irrigation and desalination energy demand in southern Algeria.

A Comprehensive Review of Turnkey Implementation Frameworks and Synchronized Operational Data by J.v.G. Technology GmbH.

# Strategic Context: Energy-Water-Food Nexus

Created as part of the PVKnowHow Knowledge Network

Prepared by J.v.G. Technology GmbH

European specialists in turnkey solar module production lines

# Key Project Data

| 500+ | 18-24 | €25-35M |
| --- | --- | --- |
| **Capacity** | **Ramp-up Period** | **Investment** |
| MW per year production capacity | Months to operational capacity | Million euros total investment |

- **Region:** Algeria
- **Line type:** Fully automated, export-oriented
- **Primary markets:** EU & North Africa
- **Source:** PVKnowHow / An experienced European turnkey provider

# Agricultural Energy Demand

## Irrigation Requirements

Agriculture consumes over 70% of Algeria's freshwater resources, with irrigated areas expanding from 350,000 ha in 2000 to over 1.3 million ha in 2020, creating substantial energy demand for water pumping systems.

## Solar-Powered Solutions

Solar technologies including desalination, filtration, and UV disinfection address seasonal water scarcity while reducing grid dependency for agricultural operations in southern regions.

## Water-Energy Efficiency

Without efficiency gains, agricultural water demand may exceed 11.3 billion $m^3$ by 2030, requiring coordinated renewable energy deployment to support sustainable farming practices.

# Desalination Energy Demand

01

## National Desalination Program

Ongoing projects aim to increase drinking water production to 3.76 million cubic meters per day by 2030, with total desalination plants reaching 25 facilities requiring substantial energy input.

02

## Energy-Intensive Operations

Initial installation costs are steep, and energy demands of desalination plants remain substantial, making renewable energy integration essential for cost-effective operations.

03

## Renewable Energy Integration

Algerian authorities emphasize incorporating renewable energy sources to reduce facilities' carbon footprint and decrease operating costs for long-term sustainability.

# Grid and Diesel Limitations

## Grid Infrastructure Constraints

- Development of unconventional resources will increase energy consumption to nearly 12% of country's total consumption
- Remote agricultural areas lack reliable grid connection
- Peak demand conflicts between urban and agricultural users
- Infrastructure limitations pose modernization obstacles

## Diesel Generator Challenges

- High operational costs for remote irrigation systems
- Supply chain vulnerabilities for fuel delivery
- Environmental impact and emissions concerns
- Maintenance requirements in harsh desert conditions

# Local Manufacturing Advantages

### Energy Security

Algeria has the highest technical and economical potential for solar power exploitation in the MENA region, with a potential of around 170 TWh per year, providing reliable local energy production capacity.

### Cost Reduction

Local production eliminates import costs and transportation delays, while providing direct energy supply for water-intensive agricultural and industrial operations in southern regions.

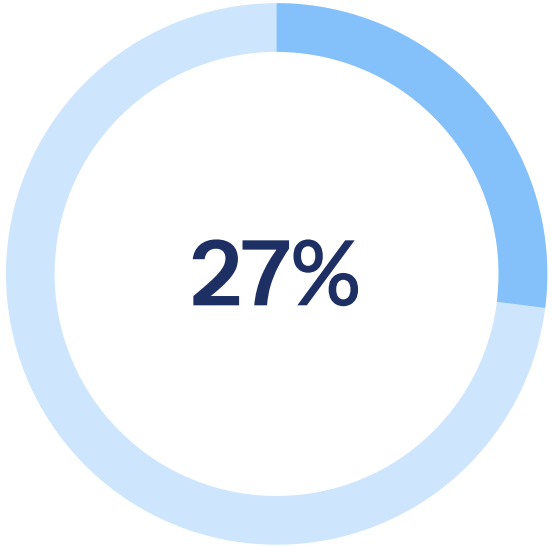
### Supply Chain Resilience

Domestic manufacturing reduces dependency on international supply chains and provides immediate access to solar components for regional energy-water infrastructure projects.

# National Policy Alignment


## Renewable Target

Algeria is aiming to increase its renewable energy capacity to 15 GW by 2035 as part of its national energy transition strategy




## Energy Mix Goal

Algeria is focusing on increasing its renewable energy output to 27% by 2035, primarily through solar power


## Job Creation

Development of PV projects is accompanied by strategy to establish local industrial sector, aiming to create 12,000 jobs

# Turnkey Manufacturing Model

### Technology Transfer (Months 1-6)

Proven European production concepts adapted for local conditions with comprehensive training programs

1

### Equipment Installation (Months 7-12)

Fully automated production line setup with quality control systems and material handling infrastructure

2

### Production Ramp-up (Months 13-18)

Gradual capacity increases from initial testing to full operational capacity of 500+ MW annually

3

### Market Integration (Months 19-24)

Export supply chain establishment and integration with EU & North African energy infrastructure projects

4

# Investment Framework

## Policy Environment

Foreign companies can now hold majority stake in project companies after abolition of 51/49 rule for renewable energy projects in 2022, creating favorable investment conditions for international partners.

## Local Content Requirements

Tender specifications include local content clause with 25% bonus on installation costs if more than 35% of materials value comes from domestic production.

## Market Demand Drivers

Growing demand from desalination projects, agricultural modernization, and national renewable energy targets provides stable market foundation for production capacity utilization.

# Strategic Assessment

Key considerations for turnkey solar manufacturing deployment in Algeria:

- Algeria's exceptional solar resources and water-energy demands create optimal conditions for manufacturing deployment
- Recent 3 GW solar tenders with €1.8 billion investment demonstrate market momentum
- Local manufacturing addresses both national energy transition goals and regional development through technology transfer
- Integration with agricultural irrigation and desalination projects provides sustainable solution for energy-water-food nexus challenges

# Source & Authorship

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Turnkey Solar Module Production Lines

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