

A Practical Guide to Building a Resilient Solar Material Supply Chain in Ghana

A strategic framework for establishing solar module production through joint venture partnerships in Ghana's rapidly growing renewable energy market.

Educational analysis of turnkey frameworks and operational insights -
Source: J.v.G. Technology GmbH.





Strategic analysis for mid-scale industrial solar manufacturing



Created as part of the PVKnowHow Knowledge Network



Prepared by J.v.G. Technology GmbH
European specialists in turnkey solar module production lines

Ghana's Renewable Energy Market Context

Ghana's electricity consumption is projected to reach 25,836 GWh in 2025, representing a 4.7% increase year-on-year. The Ghana Solar Energy Market is expected to register a CAGR of greater than 20% during the forecast period. The government has raised the renewable energy goal from 10% to 30% by 2030, with renewable capacity projected to expand to 1969.5 MW by 2035 at a compound annual growth rate of 19.1%.



Market Growth

By 2030, Ghana targets increasing renewable energy from 42.5 MW in 2015 to 1363.63 MW, with grid-connected systems totaling 1094.63 MW



Private Sector Drive

Rooftop solar installations have gained popularity due to declining costs and increasing panel efficiencies, with government incentives making solar energy more affordable and accessible



Commercial & Industrial Opportunity

The market includes residential, commercial, industrial, and utility-scale installations, with substantial growth across all segments

Why Local Manufacturing Matters



Supply Chain Benefits

Government working toward promoting local content and local manufacturing in the renewable energy industry



Manufacturing Initiative

The Integrated Power Sector Master Plan aims to construct significant onshore wind and solar PV infrastructure between 2022 and 2030



Economic Development

West African countries have opportunity to become green manufacturing hubs, advancing job creation and industrialization goals

Investment Incentives for Manufacturers

Regulatory Framework

- The 2011 Renewable Energy Act established favorable regulatory environment and incentives to promote investment
- Grid access for renewable power producers and Feed-in Tariffs (FiTs) available
- Ghana lifted its moratorium on wholesale electricity supply licenses for renewable energy projects in April 2023

Market Access Benefits

- Ghana exports power to Togo, Benin, and Burkina Faso
- USD 27.39 million African Development Fund grant for renewable energy development including mini-grids and solar PV systems
- Regional export opportunities through trade agreements
- Growing demand driven by technological advancements and cost competitiveness

Market Entry Challenges

Infrastructure Constraints

- Limited transmission capacity for new project connections
- Energy sector debt due to pricing that doesn't recover full cost creates brake on economic development
- Ongoing power interruptions ("dumsor") from maintenance issues and fuel supply difficulties

Market Volatility

- High cost of solar rooftop systems and need for battery storage
- Financial constraints and gas supply difficulties
- Regulatory complexity navigation

Local Market Knowledge

- Business practice understanding
- Government relationship management
- Skilled workforce development needs

Why a Local Joint Venture Partner is Essential

Regulatory Navigation

Established relationships with government agencies and understanding of renewable energy licensing procedures and feed-in tariff systems

Market Intelligence

Deep knowledge of local business practices, commercial and industrial customer needs, and competitive landscape

Operational Support

Access to local supplier networks, workforce recruitment, and ongoing operational management capabilities

Risk Mitigation

Shared investment exposure and local political risk management through established presence and government relations



Joint Venture Structure Overview

1

Partnership Formation

- Foreign investor provides technology and capital
- Local partner contributes market access and regulatory expertise
- Shared governance and operational responsibilities

2

Manufacturing Setup

- An experienced European turnkey provider supplies production technology
- Local partner manages site selection and regulatory approvals
- Joint investment in equipment and facility development

Financial Contribution Model

Foreign Investor Contributions

- Manufacturing equipment: 40-50% of total investment
- Technology licensing and know-how transfer
- Working capital for initial operations
- Technical training and certification programs

Local Partner Contributions

- Land acquisition and site development: 10-20% of investment
- Building construction and facility preparation
- Local regulatory approvals and licensing
- Workforce recruitment and government relations

Proven Turnkey Manufacturing Concept

Technology Platform

A proven turnkey manufacturing concept with standardized production processes and quality systems

Equipment Package

Complete production line solution including testing, certification, and commissioning support

Training Program

Comprehensive technical training for local workforce on production processes and quality control

Certification Standards

International quality certification ensuring product compliance with global market requirements

Key Project Data

Factory Type

Solar module manufacturing

Focus

Raw material sourcing & logistics

Key Materials

Cells, glass, EVA, backsheet, frames

Import Hub

Port of Tema (Ghana)

Inventory Strategy

3–6 months buffer stock

Region

Ghana / West Africa

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

Alignment with National Goals

Industrial Development

Supports Ghana's local content promotion and manufacturing development in renewable energy industry

Energy Security

Contributes to renewable energy transition aligned with 30% renewable energy target by 2030

Employment Creation

Generates skilled manufacturing jobs supporting local economic development and technology transfer

Market Supply

Accelerates commercial and industrial renewable deployment through reliable local solar module supply

Strategic Conclusion

Market Opportunity

Ghana's renewable energy targets create substantial demand for locally-manufactured solar solutions, with capacity expanding to nearly 2 GW by 2035

Joint Venture Advantage

Partnership structure balances foreign technical expertise with essential local market knowledge and regulatory navigation

Implementation Framework

A proven turnkey manufacturing concept provides reliable path to operational solar module production within 9-12 months

Source & Authorship

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