

A Strategic Guide to EU Cohesion Funds for Solar Manufacturing in Bulgaria

EU-Funded Industrial Investment Framework

Content Partner: J. v. G. technology GmbH

Turnkey solar module production lines — since 1997

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Technical Overview: EU Cohesion Funds for Solar Manufacturing in Bulgaria



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

Bulgaria

4

30–50%

6–18mo

Region

Target industrial location for EU-funded solar module manufacturing

Funding Instruments

ERDF · CF · JTF · RRF — applicable in combination depending on project profile

Typical Co-Financing

Public grant contribution as share of eligible investment costs

Timeline

Indicative range from funding application to production readiness

 Focus: Solar module manufacturing · Source: PVKnowHow / J.v.G. Technology GmbH

Bulgaria as Industrial Location

Structural Advantages

- EU member state — full access to structural and cohesion funds
- Among lowest industrial operating costs in the EU
- Available industrial zones with grid connection infrastructure
- Eligible for Just Transition Fund (JTF) in qualifying regions

Investment Climate Factors

- 10% flat corporate tax rate — lowest in the EU
- Established engineering and technical workforce base
- Proximity to key EU and Middle East export markets
- State aid frameworks aligned with EU industrial policy goals

EU Funding Instruments: Overview

ERDF — European Regional Development Fund

- Supports productive investment in manufacturing capacity
- Applicable to equipment, buildings, and technology transfer
- Managed via national/regional operational programmes

CF — Cohesion Fund

- Available in member states with GNI below 90% of EU average
- Targets environmental and transport infrastructure investment
- Can support green energy manufacturing indirectly

JTF — Just Transition Fund

- Dedicated to coal and carbon-intensive regions in transition
- Directly supports new industrial projects in qualifying areas
- Highest co-financing rates available — up to 85%

RRF — Recovery & Resilience Facility

- National recovery plans include green industrial components
- Faster disbursement than structural funds in some cases
- Supports digital and green twin-transition investments

What EU Funds Can Finance in PV Manufacturing

Capital Equipment

- Production machinery: laminators, stringers, testers, framing lines
- Automation systems and robotic handling infrastructure
- Quality control and inspection equipment (EL, IV curve)

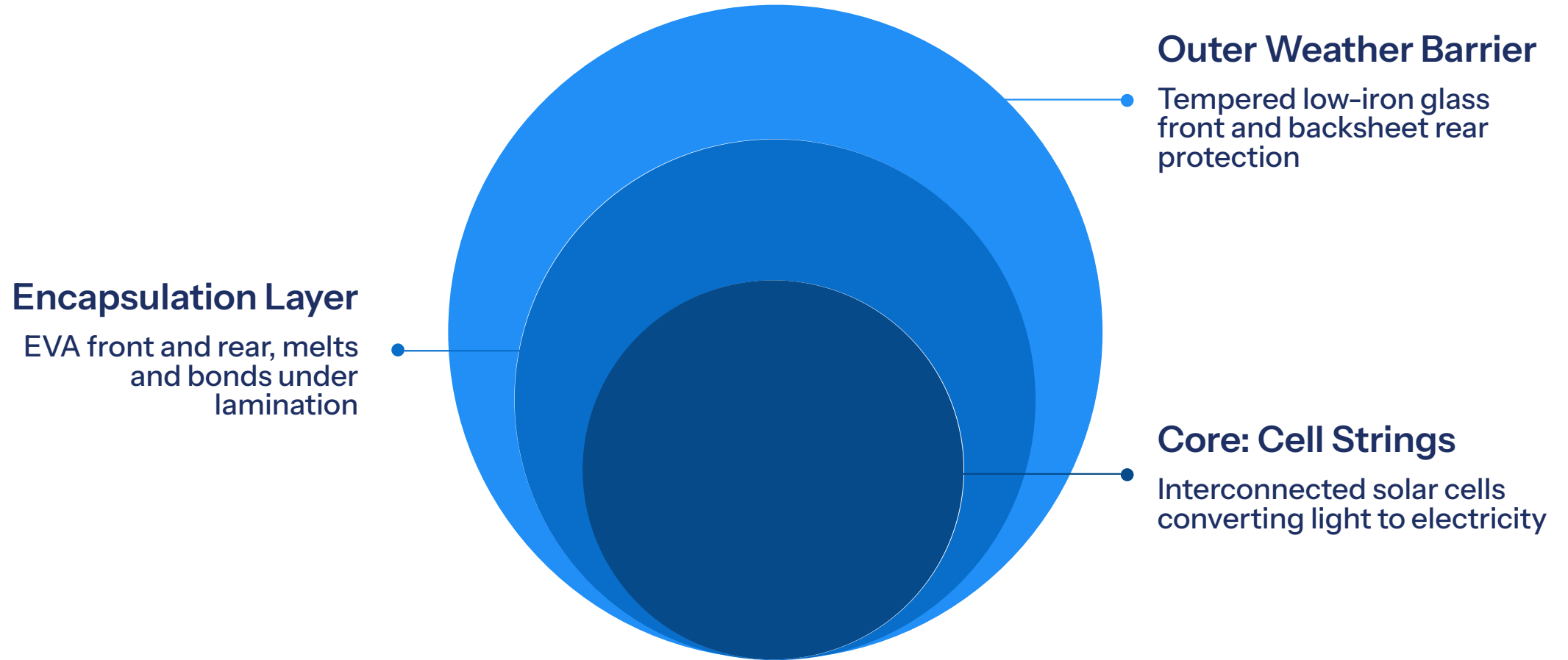
Infrastructure & Buildings

- Clean-room and controlled-environment production halls
- Utility connections: power, compressed air, HVAC
- Warehouse, logistics, and on-site testing facilities

Knowledge Transfer & Training

- Workforce training programs — no prior manufacturing experience required
- Technology licensing and process documentation
- R&D and product certification costs (IEC compliance)

Technical Foundation: PV Module Manufacturing



A solar module is a five-layer laminate — glass / EVA / cells / EVA / backsheet — permanently bonded under heat, vacuum, and pressure. The lamination step is the critical quality gateway in any manufacturing line.

Production Scale & Automation: Investment Options

Criterion	Semi-Automatic Line	Fully Automated Line
Annual Capacity	~25–100 MW/yr	>200 MW/yr
Throughput	~100–300 modules/hour	Up to ~600 modules/hour
Capex Profile	Moderate — lower entry barrier	Higher upfront; lower cost/module at scale
EU Funding Fit	Strong fit for first-phase projects	Justified with high co-financing rates
Workforce Requirement	Higher operator involvement	Primarily technical/maintenance roles
Downtime Risk	Higher (manual cycle dependency)	Lower (continuous flow possible)

Quality & Certification Standards

Performance Benchmarks

- High-quality lamination improves panel efficiency by 2–3% (NREL reference)
- Platen temperature uniformity: $\pm 5^{\circ}\text{C}$ tolerance required
- Consistent encapsulation eliminates air bubbles that degrade output
- Operating range: $\sim 135^{\circ}\text{C}$ – 180°C for EVA crosslinking

Market Access Requirements

- IEC-compliant process is prerequisite for EU and US market certification
- 25+ year module lifetime is the bankability standard for project finance
- Peel force and gel content tests are mandatory production quality controls
- Certification compliance directly supports export competitiveness

Co-Financing Strategy: Structuring the Application

1 — Phase 1 — Eligibility & Instrument Mapping

Identify applicable fund(s): ERDF, JTF, RRF based on project region and profile
Confirm eligible cost categories and maximum aid intensity under state aid rules

2 — Phase 2 — Application Preparation

Develop business plan, feasibility study, and technical specifications
Engage managing authority and confirm operational programme alignment

3 — Phase 3 — Procurement & Contracting

Public procurement rules apply to grant-funded investments
Turnkey provider selection must comply with applicable tender requirements

4 — Phase 4 — Implementation & Commissioning

Equipment delivery, installation, workforce training, and test production
Typical timeline: 6-18 months from grant approval to production readiness

5 — Phase 5 — Reporting & Verification

Progress reporting, audit readiness, and milestone documentation
Post-completion durability obligations typically 3-5 years

The Turnkey Manufacturing Concept

What a Proven European Manufacturing Concept Delivers

- Complete production line from cell stringing to final module testing
- Integrated process methodology – reduces learning curve for new operators
- On-site team training included; no prior manufacturing experience required

Technology Transfer Benefits

- TÜV-certified module designs with established field performance data
- Process parameters validated across multiple factory deployments
- Reduces technical risk – critical for EU grant compliance and bankability

Relevance for EU-Funded Projects

- Predictable capex scope supports accurate grant application budgeting
- Documented production yields strengthen project feasibility assessments
- An experienced European turnkey provider reduces execution risk for funders

Strategic Rationale: Why This Investment Now

1

Policy Tailwind

EU Net-Zero Industry Act and Solar Charter explicitly target European solar manufacturing capacity expansion

2

Cost Window

Bulgaria's operating cost advantage narrows as other EU locations industrialise – current co-financing rates are historically high

3

Market Access

EU-manufactured modules command premium positioning in public procurement and green finance frameworks

- ❏ An experienced European turnkey provider integrates lamination know-how into full-line process methodology – reducing the learning curve for new manufacturers entering production.

Key Takeaways

Location


- Bulgaria offers a compelling combination of EU fund access and low operating costs
- JTF-eligible regions can achieve co-financing above the typical 30–50% range

Funding

- ERDF, CF, JTF, and RRF can be layered depending on project structure
- Instrument selection must align with regional eligibility and state aid rules

Technology

- Proven European turnkey manufacturing concepts reduce technical and financial risk
- IEC certification and 25+ year module lifetime targets are non-negotiable for market access

 Source: PVKnowHow / J.v.G. Technology GmbH · Data reflects publicly available reference figures · Case studies are composite scenarios based on real project experience

About the Content Partner

J. v. G. technology GmbH – The DESERT Company

Founded in 1997 in Bavaria, Germany. Family-owned engineering company specializing in turnkey solar module production lines.

More than 90 factory projects delivered worldwide.

On-site team training included – no prior manufacturing experience required.

Key areas:

Turnkey PV manufacturing lines | DESERT Technology® |
TÜV-certified module designs | Factory planning to production

www.jvg-thoma.com

Contact

J.v.G. Technology GmbH

Möningerberg 1a, 92342 Freystadt, Germany

info@jvg-thoma.de | www.jvg-thoma.com

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