

Gaining a Competitive Edge: How Turkey's Customs Union Unlocks Tariff-Free Solar Module Exports to the EU

Unlocking Tariff-Free Solar Module Exports to the EU

Content Partner: J. v. G. technology GmbH

Turnkey solar module production lines — since 1997

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Technical Overview: Turkey- EU Customs Union and Tariff- Free Solar Exports



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

100–5...

Typical Scale

Entry range for new PV manufacturing investment in Turkey

€8–25M

Investment Range

Depending on automation level — semi- to fully automated lines

12–18 ...


Ramp-Up Period

Typical timeline from line installation to full-rate production

0%

EU Tariff on Turkish Modules

Under Customs Union — when Rules of Origin are met

 Line type: Semi- to fully automated · Region: Turkey / EU export market · Source: PVKnowHow / J.v.G. Technology GmbH

The EU Market Barrier: Why Access Is Restricted

Trade Defence Instruments (TDIs)

- EU has historically applied anti-dumping (AD) and anti-subsidy (AS) duties on solar imports
- Primary target: solar products from China and certain other non-EU origins
- AD/AS duties are levied on top of standard import tariffs — significantly increasing landed cost
- Duties collected by national customs authorities of the importing EU member state

Impact on Non-EU Manufacturers

- Steep cost disadvantage for solar modules imported from third countries under AD/AS measures
- Price competitiveness versus EU-domestic production is eroded
- Uncertainty around future duty changes adds procurement risk for EU buyers
- Creates structural incentive to manufacture within or under a preferential trade arrangement

Turkey as a Strategic Entry Point to the EU Market

Established Trade Framework

- EU-Turkey Customs Union operational since 31 December 1995
- More integrated than a standard free-trade area — covers most industrial goods
- Solar modules classified as industrial goods — fully included in the Customs Union

Strategic Geography

- Turkey borders EU member states — shorter shipping routes vs. Asia
- Lower logistics cost, faster delivery times, reduced transit risk
- Time-zone and cultural proximity supports business relationships with EU buyers

Industrial Infrastructure

- Established manufacturing base with experience in export-oriented production
- Growing domestic solar demand supports auxiliary supply chain development
- Skilled labor pool available at competitive cost levels

How the Customs Union Works: The Tariff-Free Mechanism



Under the Customs Union, goods manufactured in Turkey enter "free circulation" status and may be exported to any EU member state without customs duties — equivalent to goods produced within the EU itself. The A.TR movement certificate is the legal instrument that establishes this status at the border.


Rules of Origin: The Critical Compliance Requirement

What Is Required

- "Substantial transformation" must occur in Turkey — assembly alone is insufficient
- Full manufacturing process — cell stringing, lamination, framing, testing — must be performed locally
- Simply importing Chinese cells and repackaging does not qualify
- Customs authorities can audit compliance — retroactive duty application is a risk

Compliance Pathway

- Factory must be designed from the outset to meet Rules of Origin criteria
- Process documentation and traceability are essential for customs audit readiness
- A.TR movement certificate issued by Turkish customs as proof of free circulation status
- Legal and technical due diligence recommended prior to investment commitment

 Non-compliance risk: If authorities determine that "substantial transformation" did not occur in Turkey, standard third-country tariffs will be applied retroactively. Rules of Origin compliance is non-negotiable.

Full Manufacturing vs. Simple Assembly: The Distinction

Criterion	Simple Assembly	Full Manufacturing
Rules of Origin Compliance	Typically does NOT qualify	Qualifies – substantial transformation met
Tariff-Free EU Access	Not granted under Customs Union	Granted via A.TR certificate
Process Scope	Cell tabbing / stringing only	Stringing, lamination, framing, QA testing
Investment Level	Low capex – limited equipment	€8–25M depending on automation level
Audit Risk	High – easily challenged	Low – process documentation supports claim
Recommended Approach	Not suitable for EU export strategy	Required for credible, compliant EU market entry

Cost Competitiveness vs. Asian Imports

Tariff Cost Elimination

- Turkish-origin modules face 0% customs duty into EU under the Customs Union
- Asian imports subject to EU common external tariff plus potential AD/AS surcharges
- Net landed-cost advantage can offset higher local manufacturing cost vs. Asian production

Logistics Cost Advantage

- Proximity to EU significantly reduces sea freight costs versus Asia-origin shipments
- Shorter transit times reduce working capital tied up in inventory in transit
- Lower carbon footprint of supply chain – increasingly relevant for EU buyer procurement criteria

Supply Chain Reliability

- Reduced geopolitical and logistics disruption risk (e.g., Suez Canal, port congestion)
- Faster response to demand changes – shorter replenishment cycle
- EU buyers increasingly prioritizing supply chain resilience and "nearshoring" strategies

Business Case for Investors

Market Access


- Direct, tariff-free access to all 27 EU member states from a single Turkish facility
- Avoids AD/AS duty exposure that burdens competing Asian-origin module suppliers
- EU's growing solar deployment targets underpin long-term demand fundamentals

Investment Parameters

- Entry scale: ~100–500 MW/yr — manageable for mid-tier investors
- Capital requirement: €8–25M depending on automation level
- Ramp-up: 12–18 months from line installation to commercial production

Operational Model

- Semi-automated lines: lower capex, suitable for 100–300 MW/yr scale
- Fully automated lines: higher throughput, lower unit cost at larger volumes
- Proven turnkey manufacturing concepts reduce execution risk for first-time manufacturers

 A proven turnkey manufacturing concept enables new entrants to achieve compliant, export-ready production without prior PV manufacturing experience — on-site team training included.

Risks and Considerations

Rules of Origin Non-Compliance

- Primary risk: failure to demonstrate "substantial transformation" in Turkey
- Retroactive application of third-country tariffs if compliance is challenged
- Requires meticulous process planning, documentation, and ongoing audit readiness

Geopolitical and Regulatory Risk

- EU-Turkey political relationship has experienced periods of tension
- Customs Union framework has remained stable for nearly three decades — but is subject to change
- EU trade policy can shift — future AD/AS measures could alter competitive dynamics

Execution Risk

- Technology selection, supplier qualification, and process ramp-up require specialist expertise
- 12–18 month ramp-up creates a window of capital exposure before revenue generation
- Cell and material sourcing strategy must be compatible with Rules of Origin requirements

Strategic Conclusion

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EU Barrier Is Structural

AD/AS duties and tariffs create a durable cost disadvantage for Asian-origin solar imports — the barrier is policy-driven, not temporary

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Turkey Offers a Credible Solution

The 1995 Customs Union, combined with geographic proximity, provides a legally robust and logistically efficient pathway to tariff-free EU market access

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Compliance Is the Differentiator

Full manufacturing — not assembly — combined with A.TR certification is the non-negotiable requirement that separates credible EU market entrants from those exposed to retroactive duty risk

- ☐ For investors evaluating EU solar market entry: Turkey's Customs Union advantage is durable, documented, and actionable — provided that Rules of Origin compliance is built into the factory concept from day one.

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

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