EUROPEAN SOLAR MANUFACTURING COUNCIL

Why the EU's Decision on High-Risk Inverters is Executable

The inverter is the brain of every solar installation. Who controls the brain controls the grid.

Christoph Podewils,
Secretary General ESMC

Agenda

- How exposed is Europe’s power grid?
- Can Western manufacturers deliver?
- Focus on Eastern Europe
- How To Accelerate the Transition?

How exposed is Europe's power grid?

20 Years of Chinese Research on Western Grid Weaknesses

Bibliometric study by Czech Technical University (CTU), March 2025 | 54,000+ publications analysed

54,000+

Chinese power grid publications (Scopus)

8,562

Papers on attacks, vulnerabilities & disruptions

367

Publications explicitly targeting the US power grid

166

Publications referencing European power systems

US Grid: Openly Adversarial

Chinese researchers model how to trigger cascading failures in the US grid using minimal resources — including node removal, false data injection, and control system manipulation. Simulations use real US infrastructure data.

EU Grid: Covert Embedding

EU-focused research is smaller and less overtly adversarial — but models vulnerability propagation using real Italian and French grid data. Strategy: long-term technological embedding and standards influence.

Smart Grid as Attack Surface

The keyword 'smart power grids' acts as a bridge between renewable energy and attack modelling clusters — meaning solar, EVs and batteries are simultaneously seen as clean energy assets and attack entry points.

Europe's Inverter Dependency: The Scale of the Risk

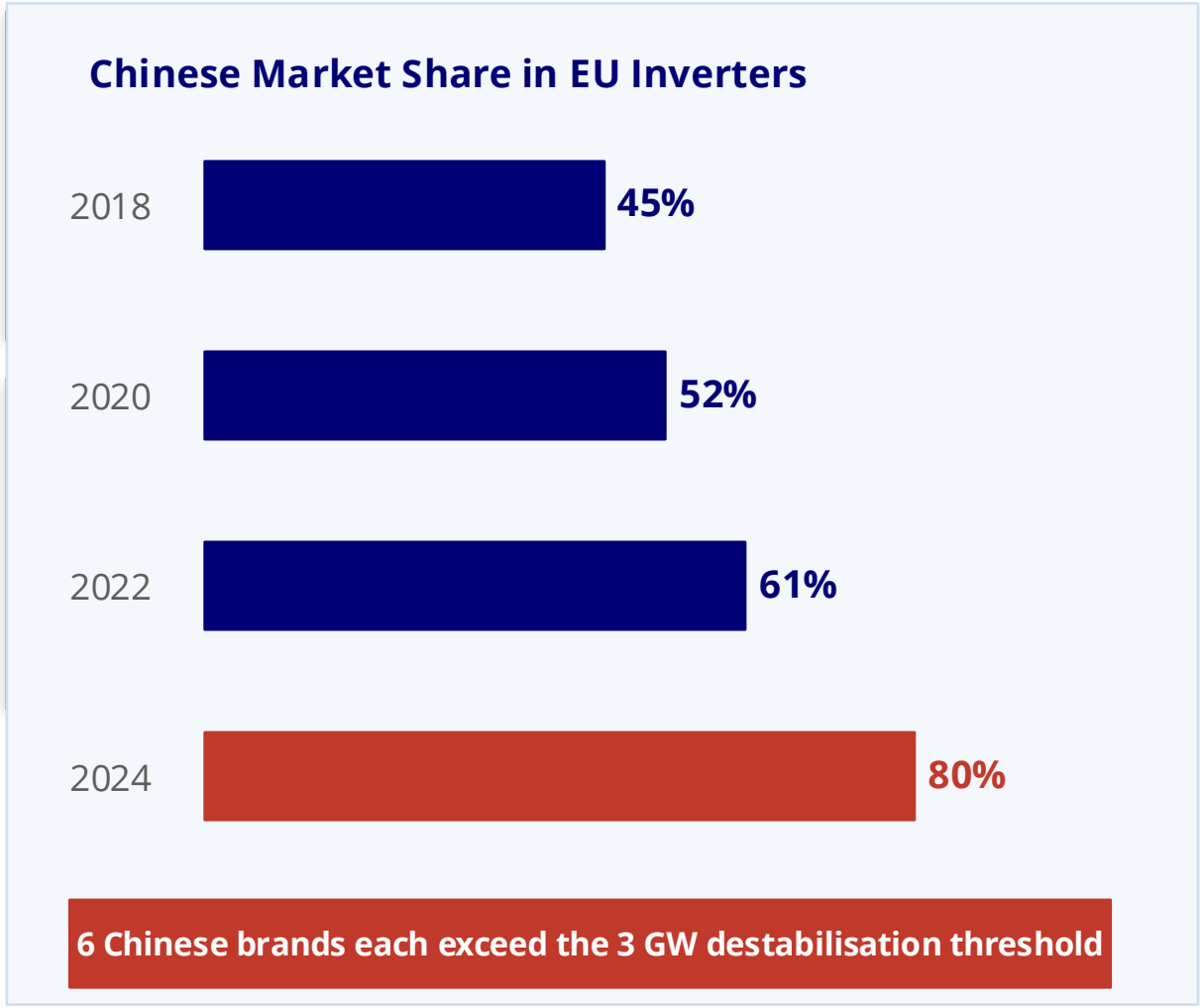
Source: SolarPower Europe / DNV Report 2025 | ESMC Manufacturing Survey 2026

~200 GW

Chinese inverters
installed in Europe

3 GW

minimum compromised capacity
to destabilise the EU grid



National Security Authorities Sound the Alarm

BSI (Germany) | January & May 2025

China could shut off Germany's electricity supply

The German Federal Office for Information Security warned of 'substantial risk potential' from Chinese inverters. The BSI identified China's "Nylon Typhoon" as actively targeting German critical infrastructure. It called inverter remote-access a 'foreign interference point' for energy supply — and pushed for expanded supervisory powers over the energy sector.

Czech NUKIB | 2024–2025

Czech authorities classified Chinese inverters as a security risk

The Czech national cybersecurity authority (NUKIB) warned of risks from Chinese-made solar components. Czech Technical University (CTU/UCEEB) conducted the most comprehensive academic study to date, confirming that Chinese researchers have built technically advanced, scalable knowledge of how to attack Western power systems.

Lithuania & Others | 2024–2025

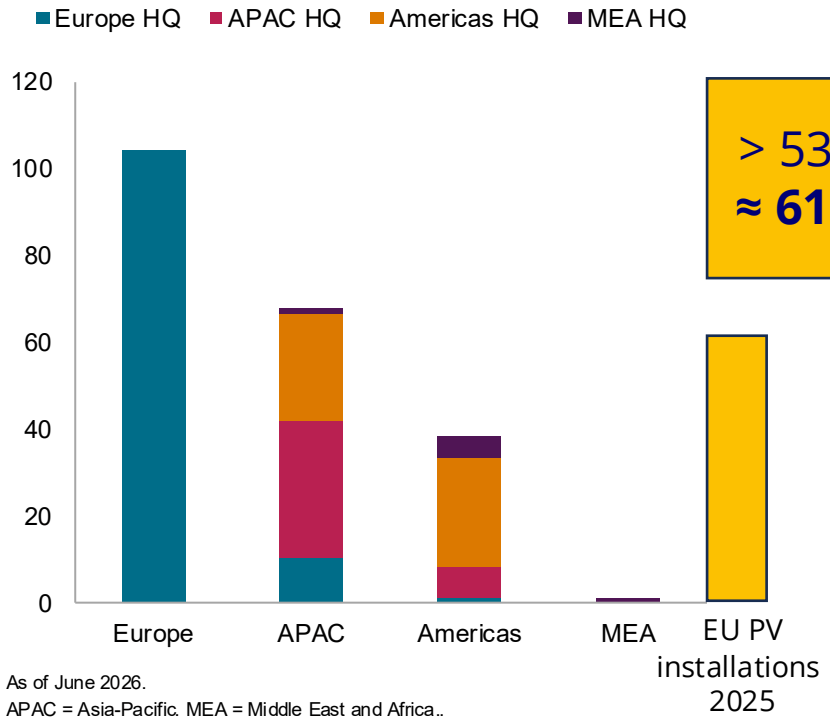
Baltic and Central European states ban or restrict Chinese inverters

Lithuania, Latvia and several other EU member states moved ahead of the Commission, banning or formally classifying Chinese inverter brands as high-risk. More than 30 MEPs signed an open letter in autumn 2025 demanding 'immediate and binding measures' — a key political trigger for the Commission's decision.

Can Western manufacturers deliver?

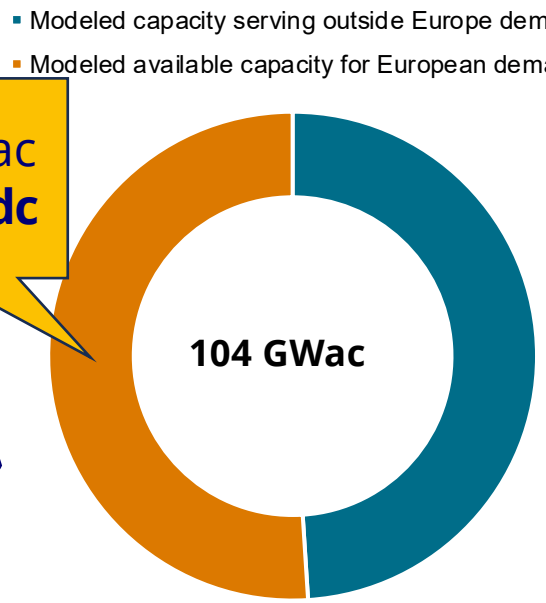
S&P: Western Production Capacity Meets EU Demand

PV & energy storage inverter manufacturing capacity of non-Chinese suppliers by region, split by supplier headquarters (HQ) (GWac)



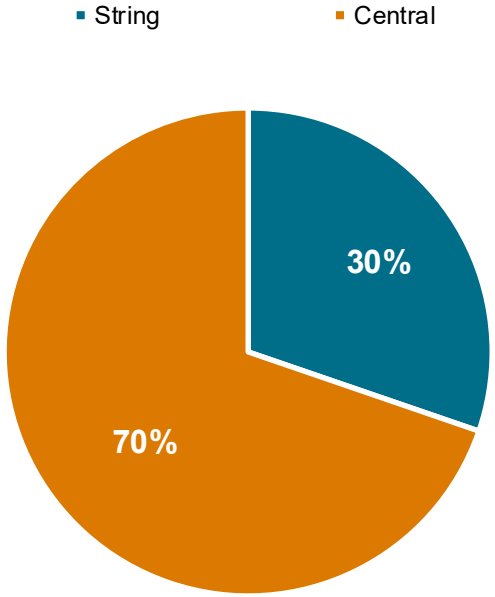
As of June 2026.
APAC = Asia-Pacific. MEA = Middle East and Africa..
Source: S&P Global Energy.

Serving footprint of European manufacturing capacity: Europe vs outside Europe demand (GWac)



As of June 2026.
The shares shown for capacity serving outside Europe demand vs available for European demand are modeled based on regional shipment distribution.
Source: S&P Global Energy.

European manufacturing capacity by inverter type (GWac)



As of June 2026.
String inverter includes inverters for all system types of residential, commercial and utility-scale.
Source: S&P Global Energy.

- Manufacturing capacity data is available in the Clean Energy Technology research factory database.
- Source: S&P Global Energy

Western inverters: Small Price for Energy Security

EU / Western-inverter premium shown on top of the 100% project-cost baseline — Germany · Spain · Eastern EU

≈ 2%

Utility-scale & commercial premium — negligible at system scale

3–4%

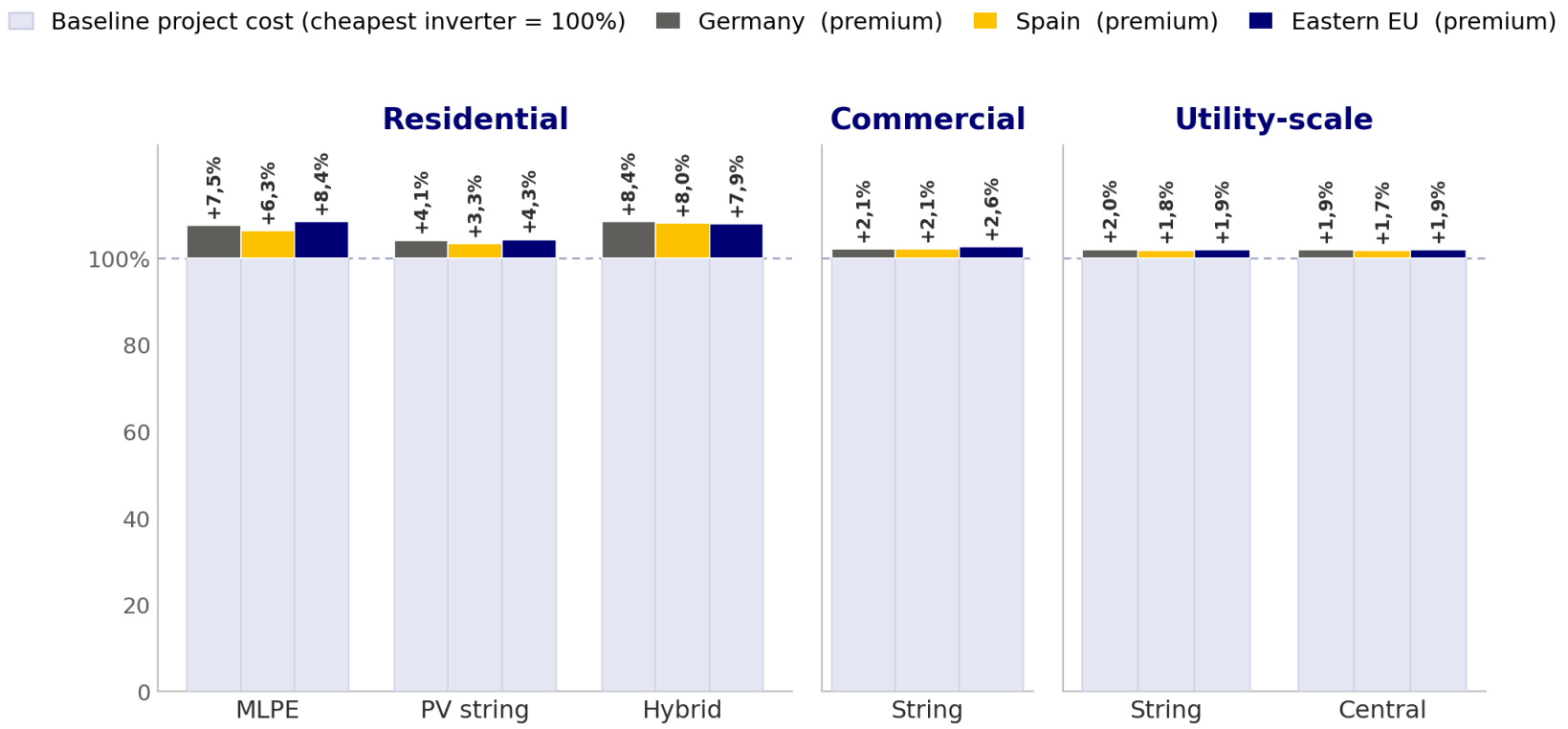
Residential premium for string invertes

up to 8 %

Systems with micro inverters and power optimizers and hybrid inverters

≈ parity

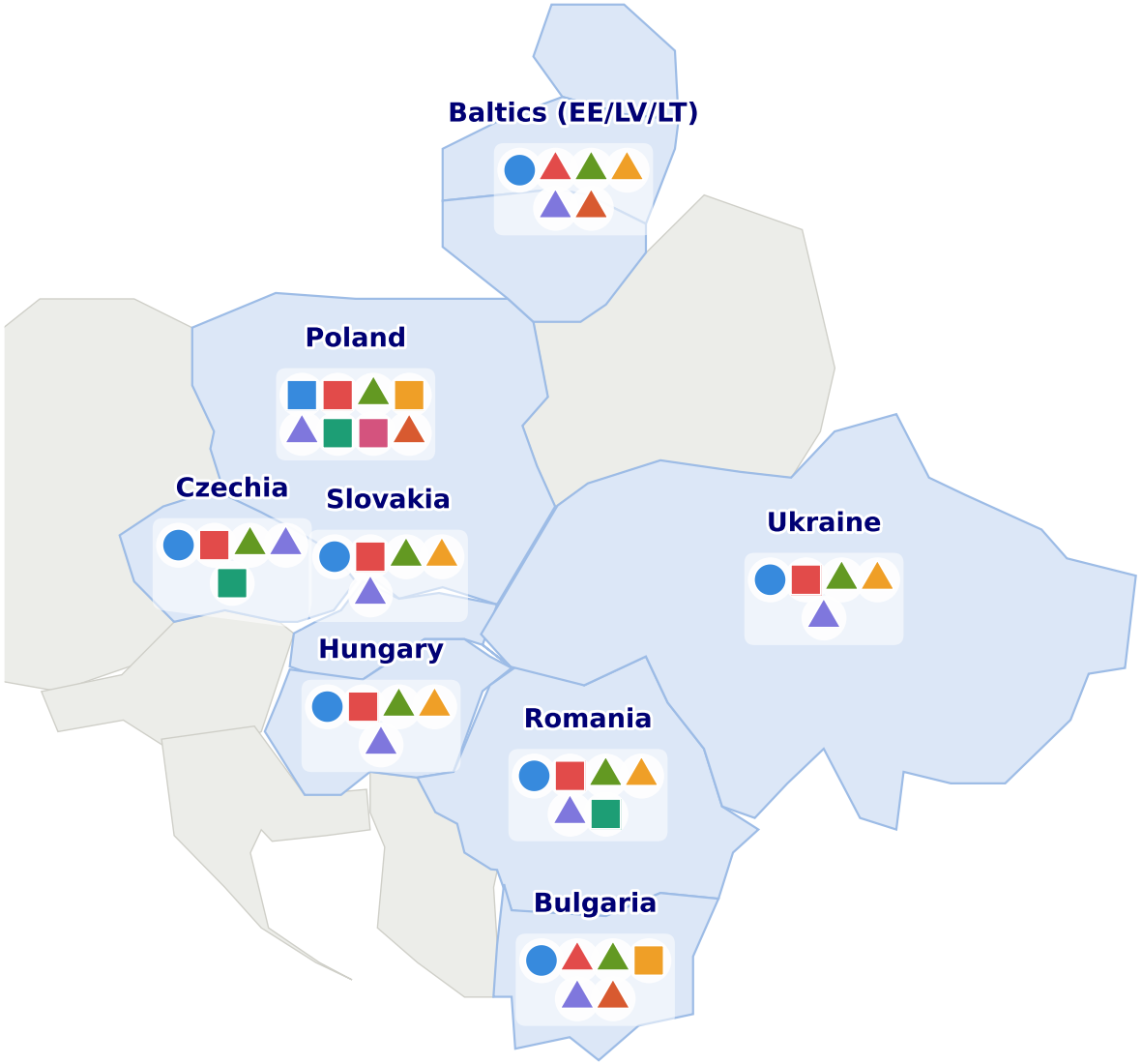
Eastern EU broadly in line with Germany & Spain — no structural cost disadvantage



Source: Wood Mackenzie analysis (2026)

Focus on Central and Eastern Europe

Western Inverter Manufacturers are Already Established Across Central and Eastern Europe



Manufacturer

- SMA
- Fronius
- KOSTAL
- SolarEdge
- FIMER
- Ingeteam
- Power Elec.
- Enphase

Type of presence

- Subsidiary / branch
- Service hub
- Distributor

Colour = manufacturer · icon = presence type.
Baltics = EE/LV/LT combined. Shows local sales/service contactability, not production.
As of June 2026.

Source: Manufacturer´s Websites/AI Research

Western Inverter Manufacturers are Already Established Across Central and Eastern Europe

Decades on the ground, local teams and partners, a multi-gigawatt installed base — and able to scale up substantially within months.

≈ 14 GW

Installed base across 8 markets

Since ~ 2010

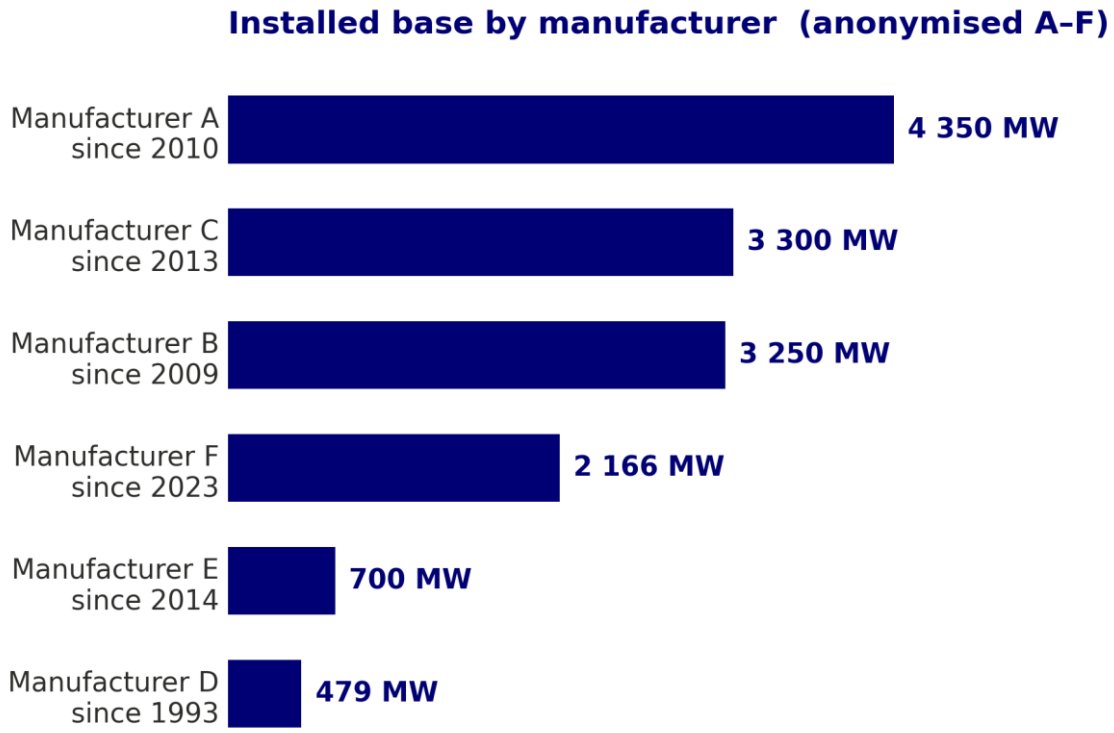
Established presence

≈ 330

Sales & service local or dedicated staff remote

≈ 6 months

To scale up sales & service substantially



ESMC survey among western manufacturers

Poland

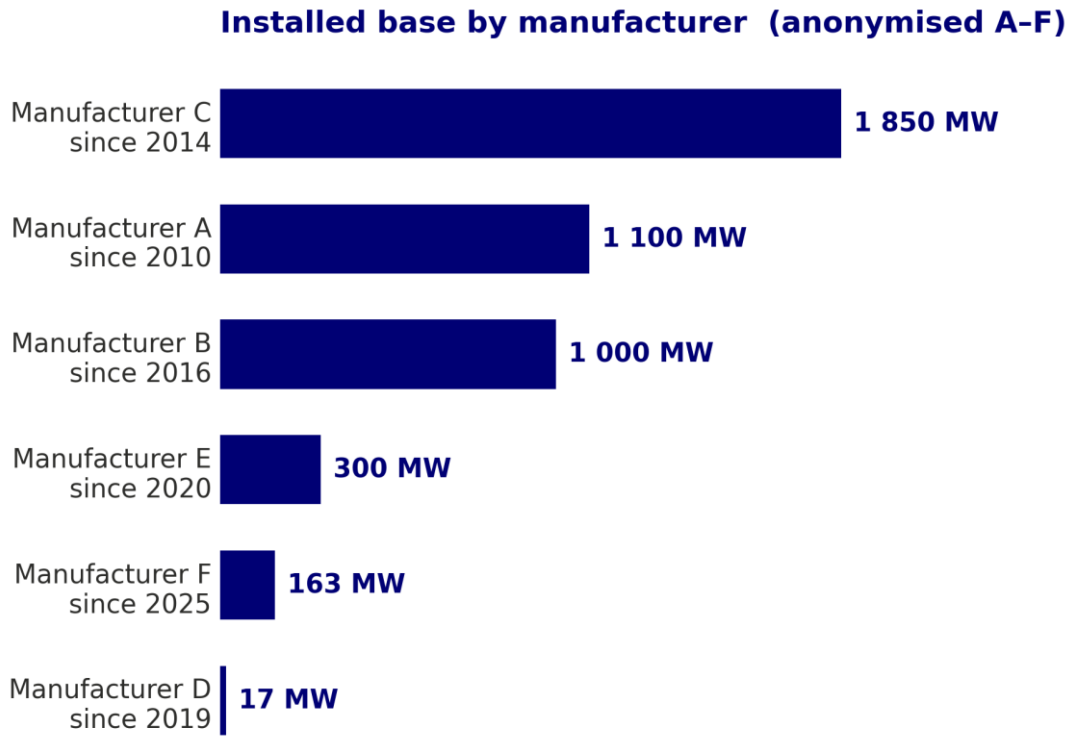
Western inverter makers are established and locally supported here — and able to scale up within months.

4 430 MW
Installed base

Since 2010
Established local presence

≈ 74
Sales & service local or dedicated staff remote

≈ 3 months
To scale up substantially



6 of 6 western manufacturers active in Poland. Anonymised A–F.
ESMC survey among western manufacturers

Hungary

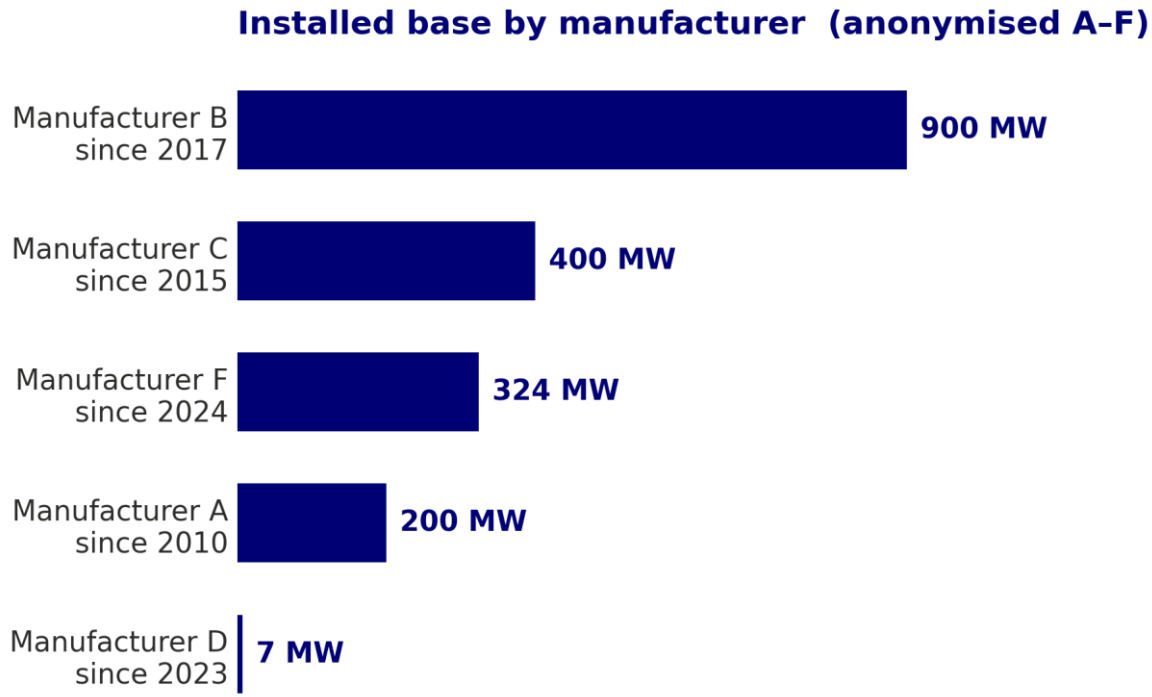
Western inverter makers are established and locally supported here — and able to scale up within months.

1 831 MW
Installed base

Since 2010
Established local presence

≈ 27
Sales & service local or dedicated staff remote

≈ 6 months
To scale up substantially



5 of 6 western manufacturers active in Hungary. Anonymised A–F.

ESMC survey among western manufacturers

Czech Republic

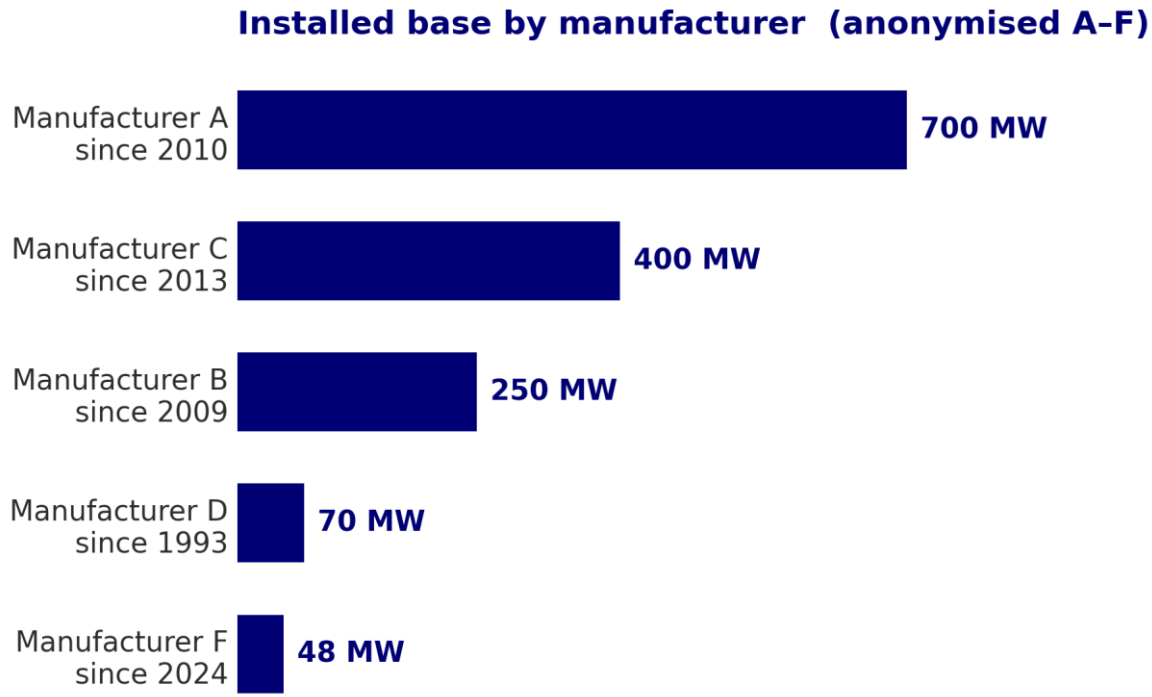
Western inverter makers are established and locally supported here — and able to scale up within months.

1 468 MW
Installed base

Since ~ 2010
Established local presence

≈ 56
Sales & service local or dedicated staff remote

≈ 6 months
To scale up substantially



5 of 6 western manufacturers active in Czech Republic. Anonymised A–F.

ESMC survey among western manufacturers

Romania

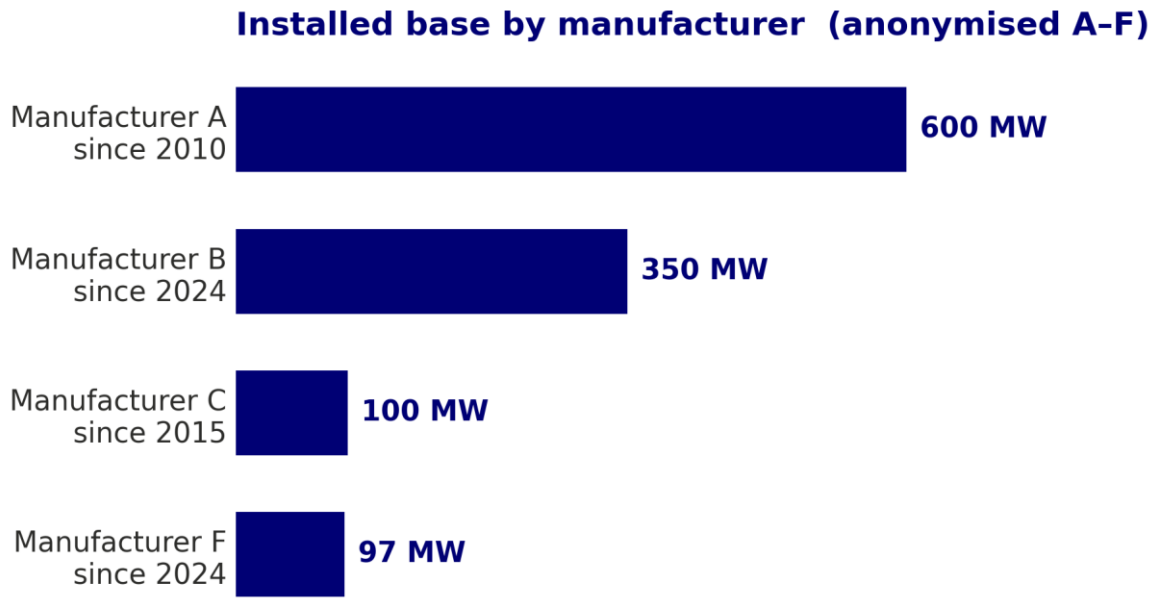
Western inverter makers are established and locally supported here — and able to scale up within months.

1 147 MW
Installed base

Since 2010
Established local presence

≈ 19
Sales & service local or dedicated staff remote

≈ 4 months
To scale up substantially



5 of 6 western manufacturers active in Romania. Manufacturer D also present (base n/a). Anonymised A–F.

ESMC survey among western manufacturers

Bulgaria

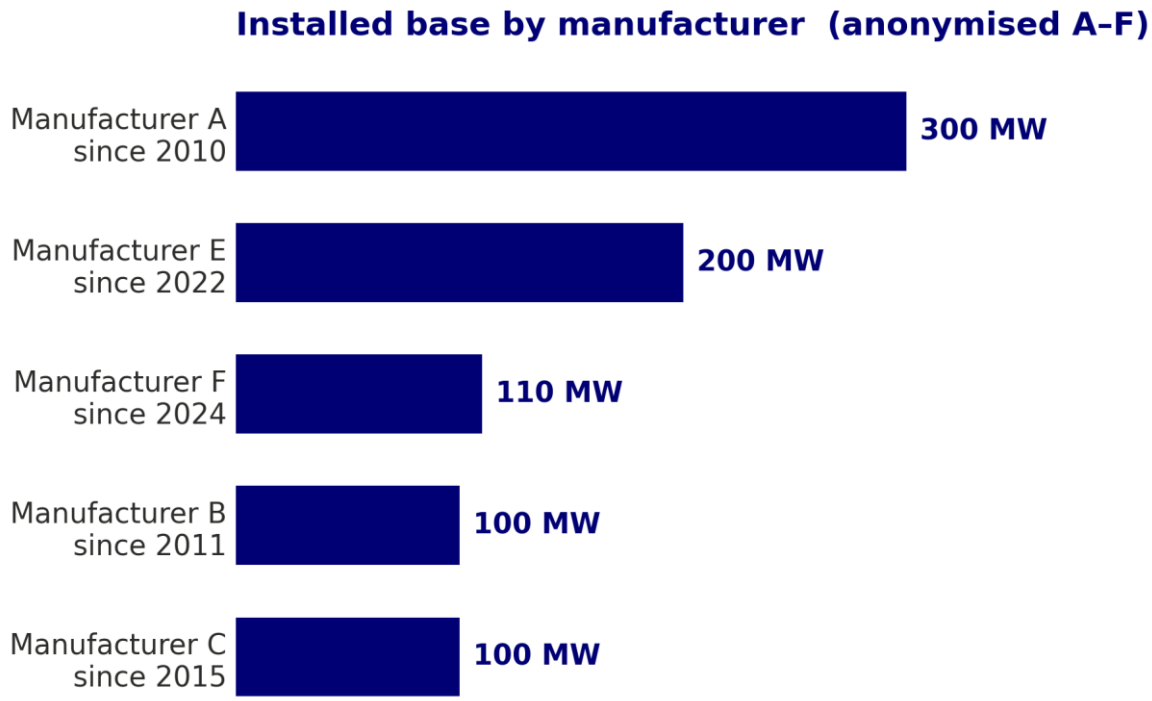
Western inverter makers are established and locally supported here — and able to scale up within months.

810 MW
Installed base

Since 2010
Established local presence

≈ 59
Local Sales & service local or dedicated staff remote

≈ 6 months
To scale up substantially



5 of 6 western manufacturers active in Bulgaria. Anonymised A–F.
ESMC survey among western manufacturers

Slovakia

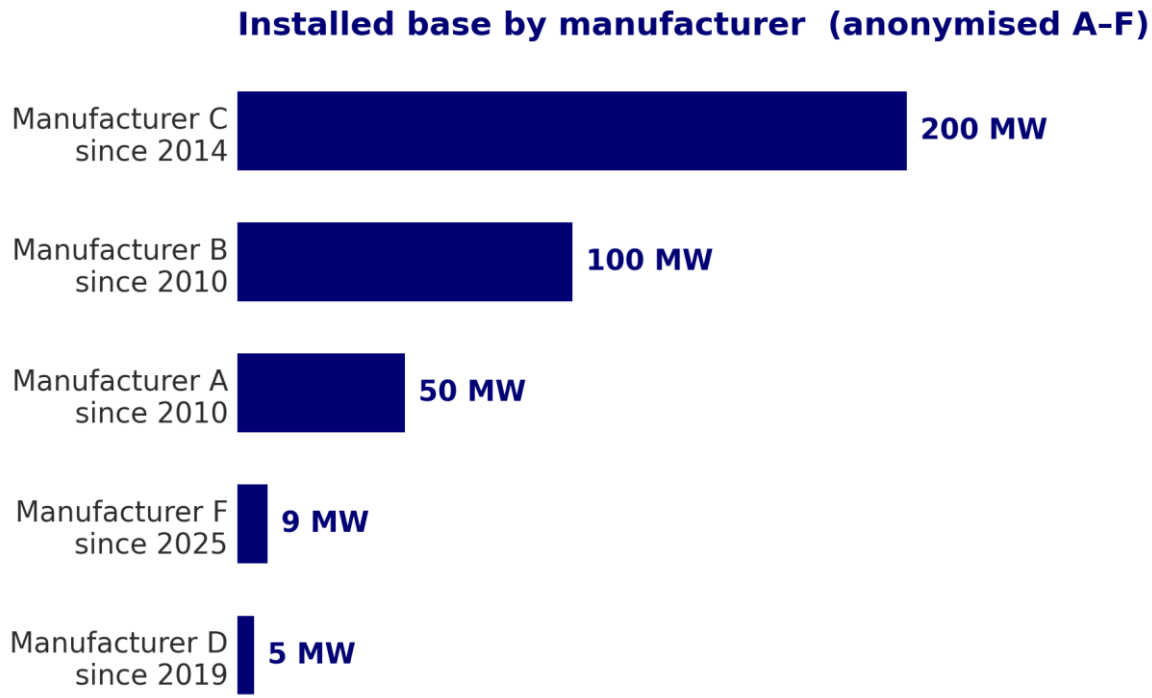
Western inverter makers are established and locally supported here — and able to scale up within months.

364 MW
Installed base

Since 2010
Established local presence

≈ 22
Local Sales & service local or dedicated staff remote

≈ 6 months
To scale up substantially



5 of 6 western manufacturers active in Slovakia. Anonymised A–F.
ESMC survey among western manufacturers

How To Accelerate the Transition?

How to Accelerate?

Two simple measures to support the market

1. European Commission Could Publish Written Guidance

- Could address in particular consequences for indirect EU financing and on the affected markets
- Ends questions and uncertainty from the market
- Provides investment certainty to project developers
- Provides investment certainty to inverter mnufacturers, wholesalers, etc. and lets them accelerate adjustments
- Sets example to Member States

2.Lead Pooling to Streamline the Transition

- Manufacturers could establish special transition teams
- Manufacturers could creat dedicated email-address and other channels to contact special teams
- EIB or other EU entity could set-up one single email address Which routes incoming RFQ from affected projects to all eligible manufacturers/special teams
- DISCLAIMER: This is a first idea which needs to be further assessed

EUROPEAN SOLAR MANUFACTURING COUNCIL

Thank you very much!

podewils@esmc.solar