



Solar, Wind and Data Centres: Building Confidence in Connected Power

8th Cybersecurity Forum Symposium

29 Oct, 2025, Brussels

Agenda

- 1 Solar and the Smart Grid
- 2 What you can do today

Agenda

1 Solar and the Smart Grid

2 What you can do today

Bottom line

A Paradigm Shift - Solar as critical infrastructure



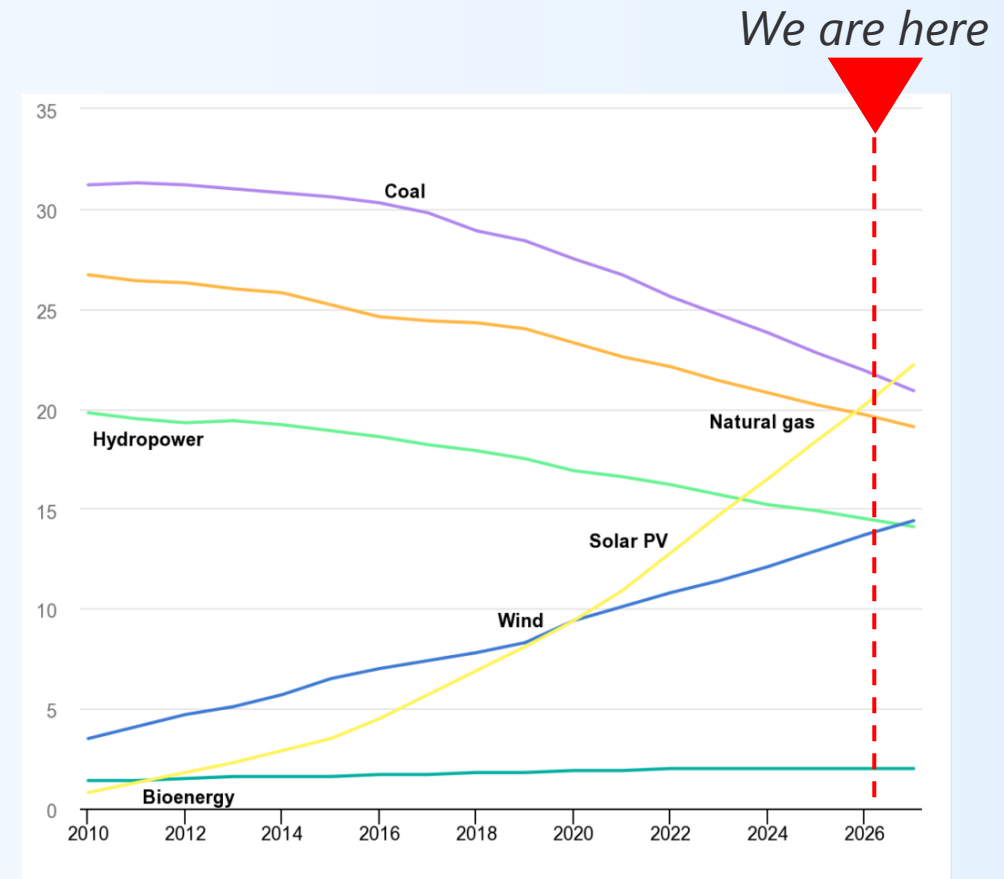
When did it become one?

Bottom line

A Paradigm Shift - Solar as critical infrastructure



1 month ago



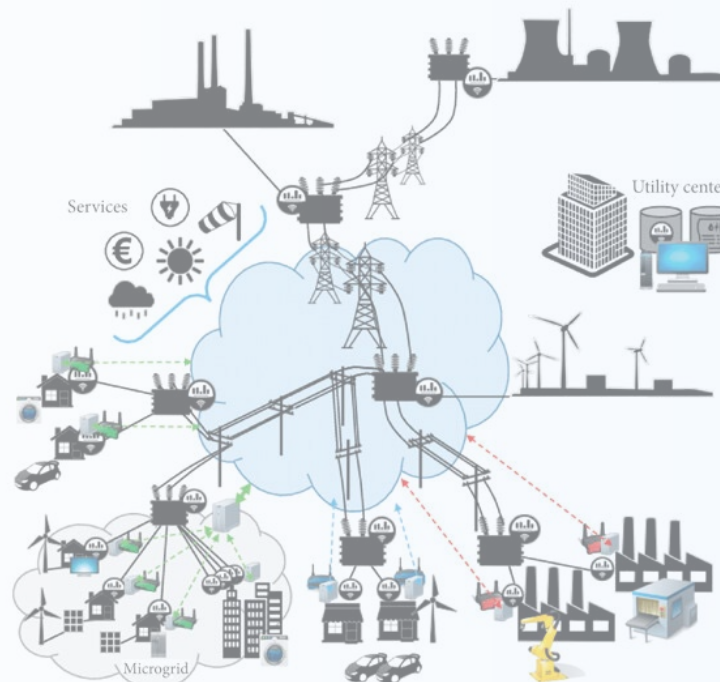
Source: IEA 2022; Share of cumulative power capacity by technology, 2010-2027

Solar, Wind and Data Centres

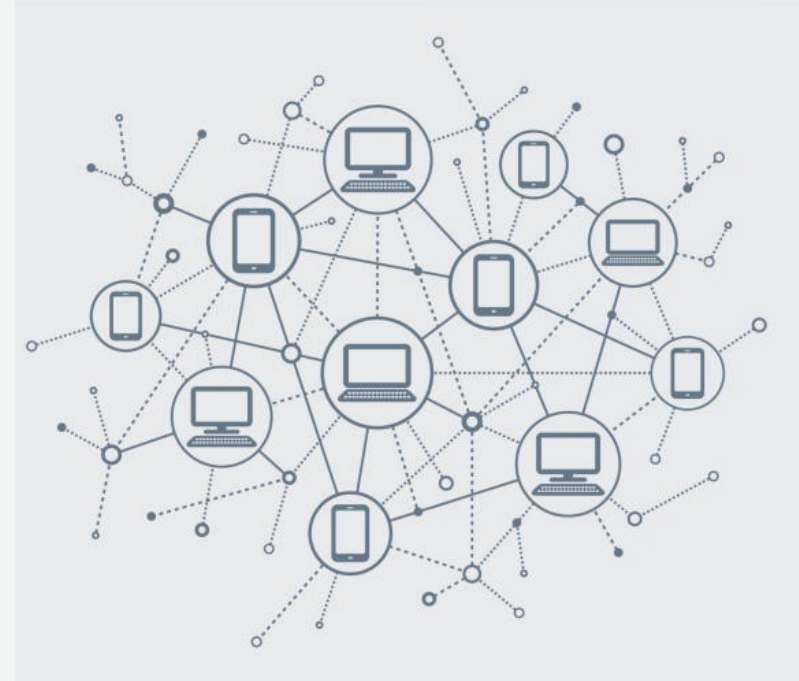
Europe's grid today

- **Consumers becoming producers**
- **>10 million** solar installations powering Europe and UK
- **>75GWp** (residential only)
- **>450GWp** total power

Power grid



Internet



Solar, Wind and Data Centres

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Europe's grid by 2030

- REPower EU Solar target (**750GW**)
- Heat Pumps (100-**300GW** peak), *EHPA*
- EV Chargers (100-**150GW** peak), *ChargeUp Europe*
- Grid tied Batteries (~**200 GW** \ 400GWh), *EASE*
- Datacentres (25-**50GW** peak), *EUDCA*



Smart Grid



Solar, Wind and Data Centres

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Smart Grid



Solar, Wind and Data Centres

Europe's grid today

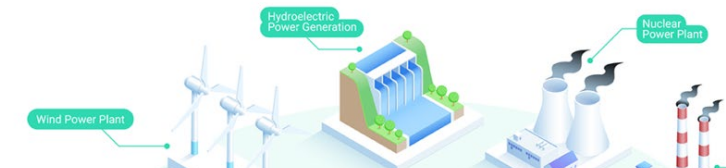
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Smart Grid



Critical Thresholds: **2-20GW** (e.g. Iberian Blackout)

x50- x500 above

What can go wrong?

- Too many things:
 - Grid Instability
 - Energy Ransom
 - Metering Fraud
 - Vandalism
 - Pattern-of-life (privacy)



Residential
2-30kW



C&I
50-1,000kW



Common Utility
1-50MW



Large Utility
50MW – 500MW

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pv magazine



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Ukrainian photovoltaic power plant partially back in operation after rocket attack

A Russian missile attack hit a 3.9-megawatt photovoltaic plant near Kharkiv last week, damaging 416 solar modules and four string inverters.

JUNE 2, 2022 EMILIANO BELLINI

HIGHLIGHTS OF THE WEEK

MARKETS

UKRAINE



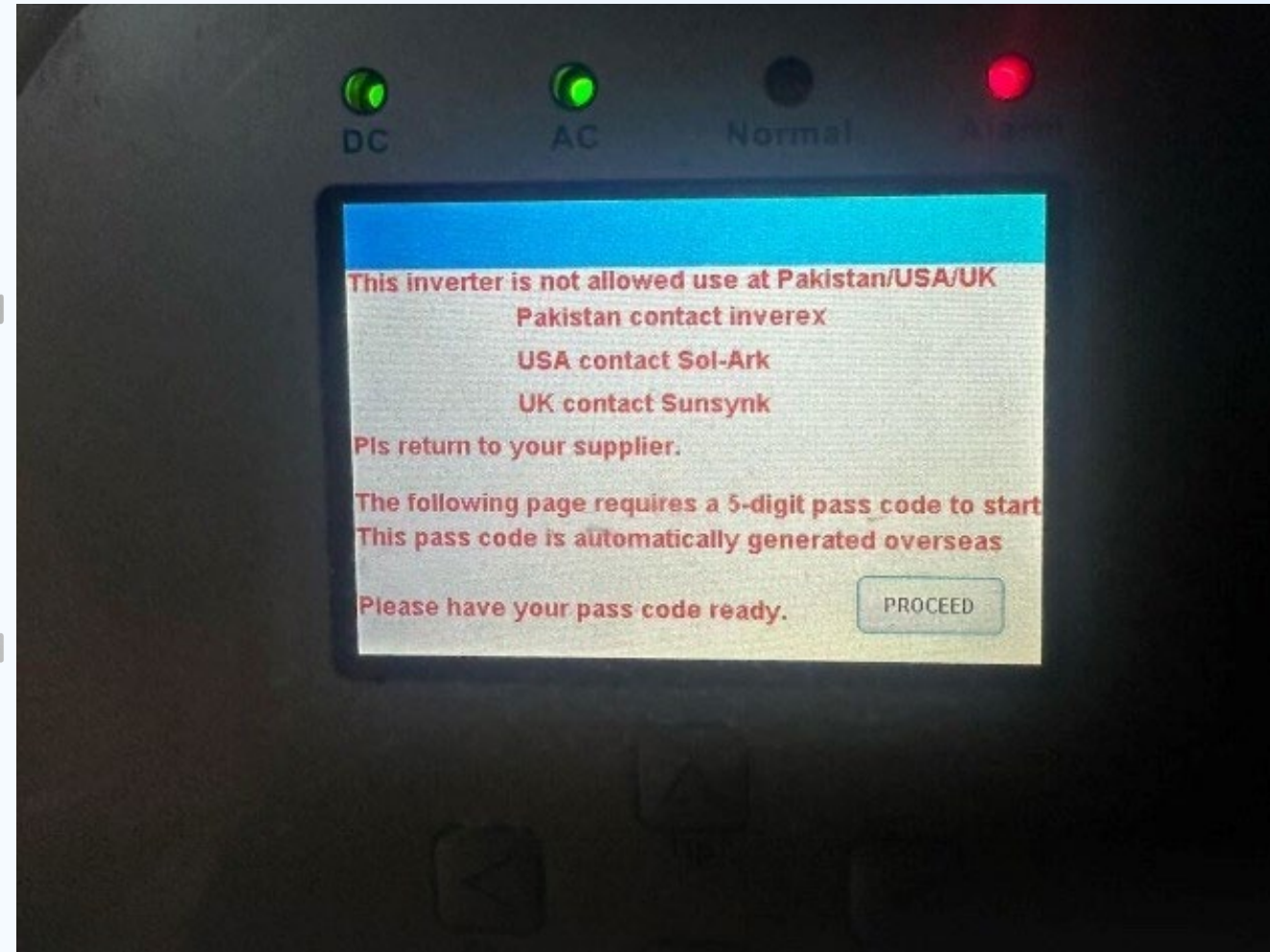
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- A true story:



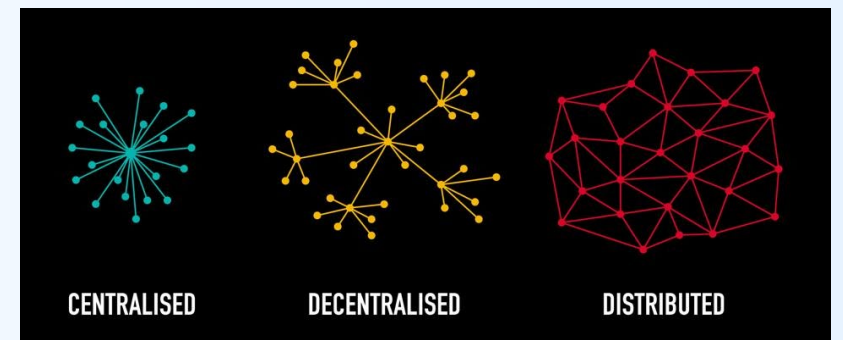
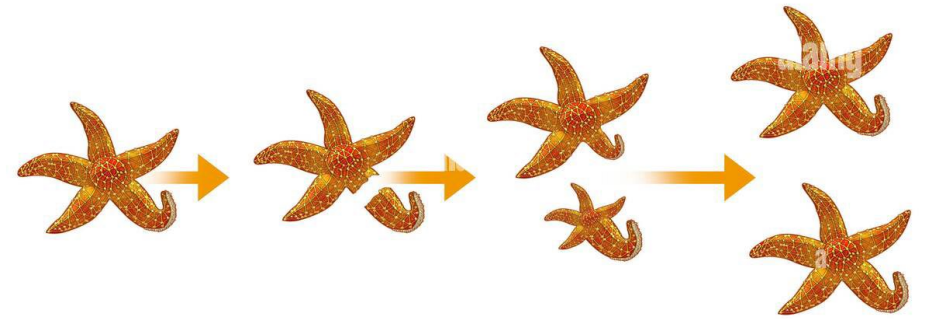
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 - Vandalism
 - Pattern-of-life (privacy)
- A true story:
 - Homeowners in USA wake up to locked PV systems



Don't Worry – Be Happy

- The internet was **designed decentralized**, for resilience
 - A decentralized grid can act same
 - A home with a solar + battery \ V2G is independent
 - So is a country, or continent
- **Great room for innovation** in grid management
- And of course, capacity factor optimization
 - Billions of EUR
 - Cleaner energy
- **Secure digital systems are “easy”** (e.g. Banks)
- We just need to build it right



Agenda

1 Solar and the Smart Grid

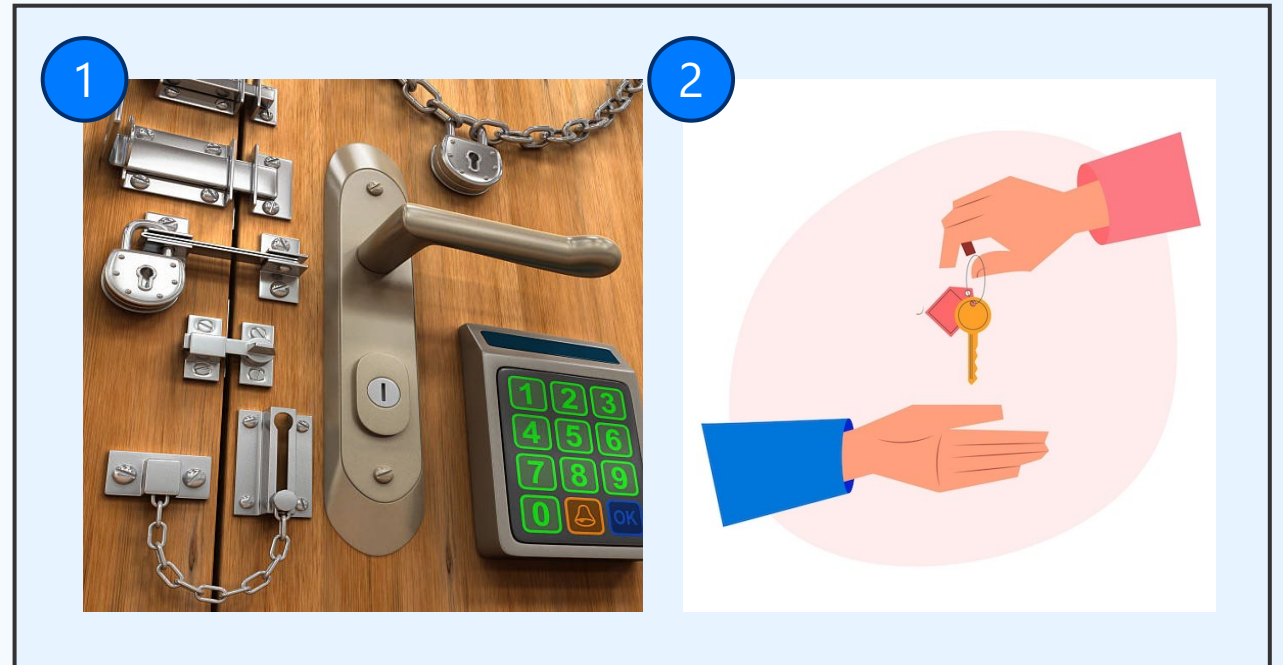
2 What you can do today



Two Problems

Two cyber problems:

1. Technical – “How secure should this be?” (Like Banks? Airplanes? Cars?)
2. Political \ Sovereign – “Who should be allowed control?”



First: Call a Spade a Spade

- Every EU Member State has “critical infrastructure definitions”
- In Germany it's $>104\text{MW}$
- It needs to be **AGGREGATED $>104\text{MW}$**



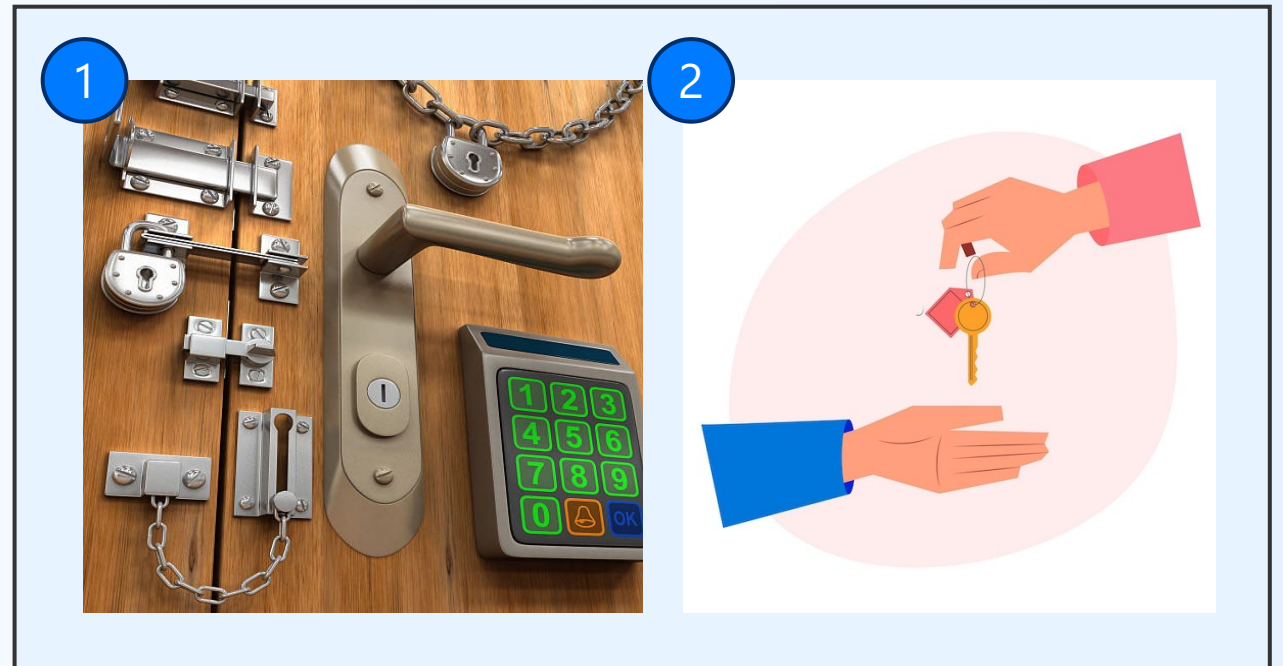
First: Call a Spade a Spade

- Every EU Member State has “critical infrastructure definitions”
- In Germany it's >104MW
- It needs to be **AGGREGATED >104MW**
- What this usually means:
 - Risk assessments & audits
 - Localization of operational control
 - Supply chain controls
 - Foreign Direct investment requirements
 - etc



Next:

- Decide on technical level of security
- Decide on political level of trust



Tools for implementation

Legislative

- EU Laws (e.g. NIS 2 implementation guidelines)
- NIS 2 transpositions (e.g. Germany's KRITIS II)
- CRA Annex III revision to include DERs

Network Code on Cyber Security

- Add "Aggregated" to all ECII criteria

Country Level TSO\DSO grid connection permits

- Add "Cyber" to interconnection rules
- Contracts for power export, flexibility, to include "cyber"

Other

- Subsidies, Tariffs, Non-Price Procurement Criteria (e.g. NZIA)
- Standards & Certifications (CEN \ CENELEC or member state level)
- Insurance requirements
- Commercial contracts



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Most Important slide

Don't worry – be happy #2

Small group of entities:

- **Inverter OEMs**
 - 10-20 maximum
- **VPP platforms**
 - Less than 10
- **Large installers**
 - Dozens
- **3rd party suppliers**
 - Dozens



This is a manageable problem

Summary

- The Grid is Changing
- We can build confidence into connected power
- Start by extending **existing definitions**
- This is a manageable problem



Questions?



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<https://www.linkedin.com/company/solardefend/>

