Η πρόκληση της ενέργειας: Κόστος και ανταγωνιστικότητα της βιομηχανίας

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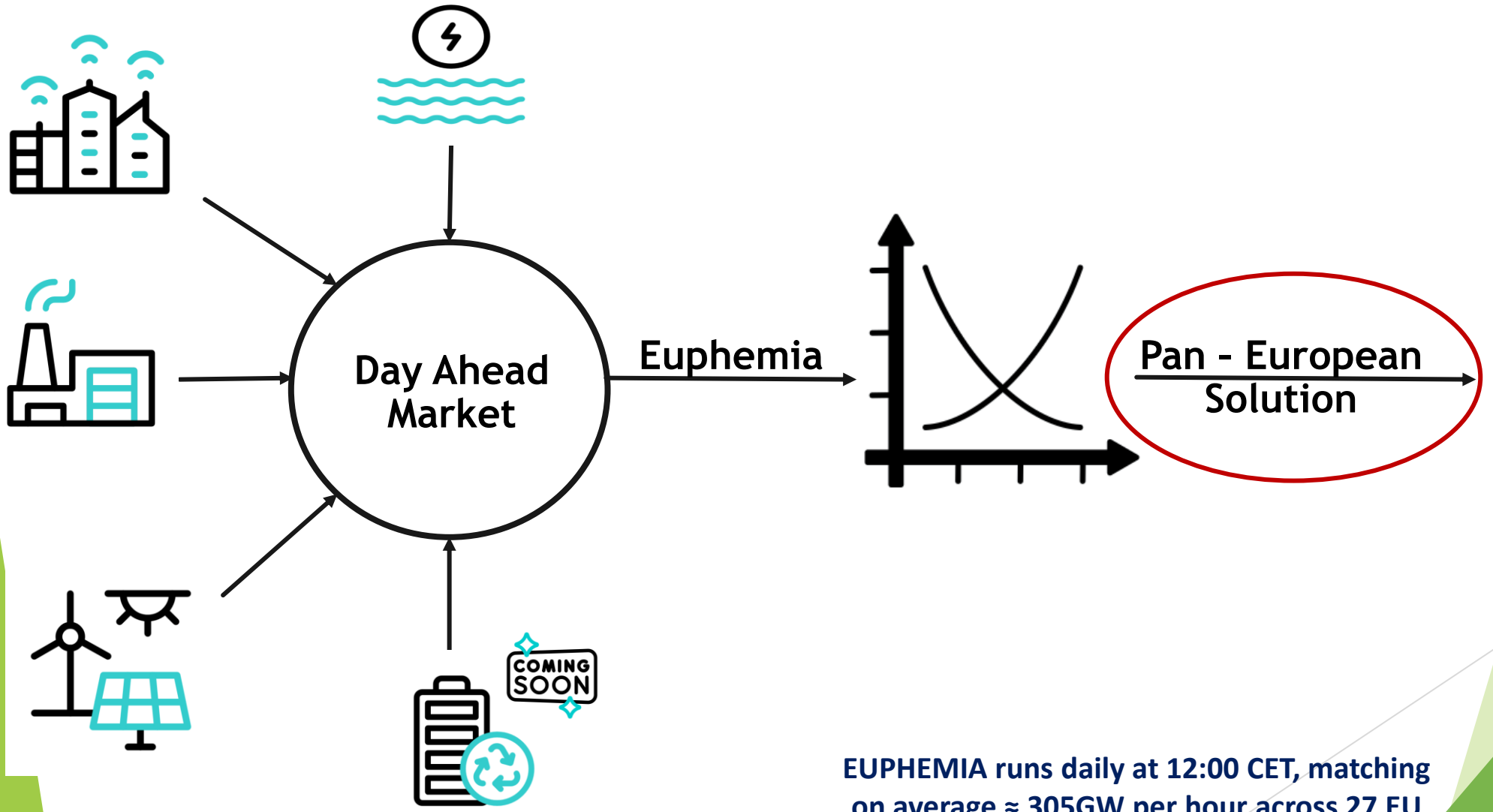
Power exchanges

Europe’s power exchanges are the backbone of market integration, enabling transparent, competitive, and cross-border electricity trading

Day-Ahead Market (DAM)



EUPHEMIA runs daily at 12:00 CET, matching on average ≈ 305GW per hour across 27 EU countries

Electricity Target Model (ETM)

Vision for a Unified Energy Market

Driven by the EU's goal of creating a single, integrated electricity market that enhances competition, boosts efficiency, and supports the energy transition.

Core Elements of the ETM:

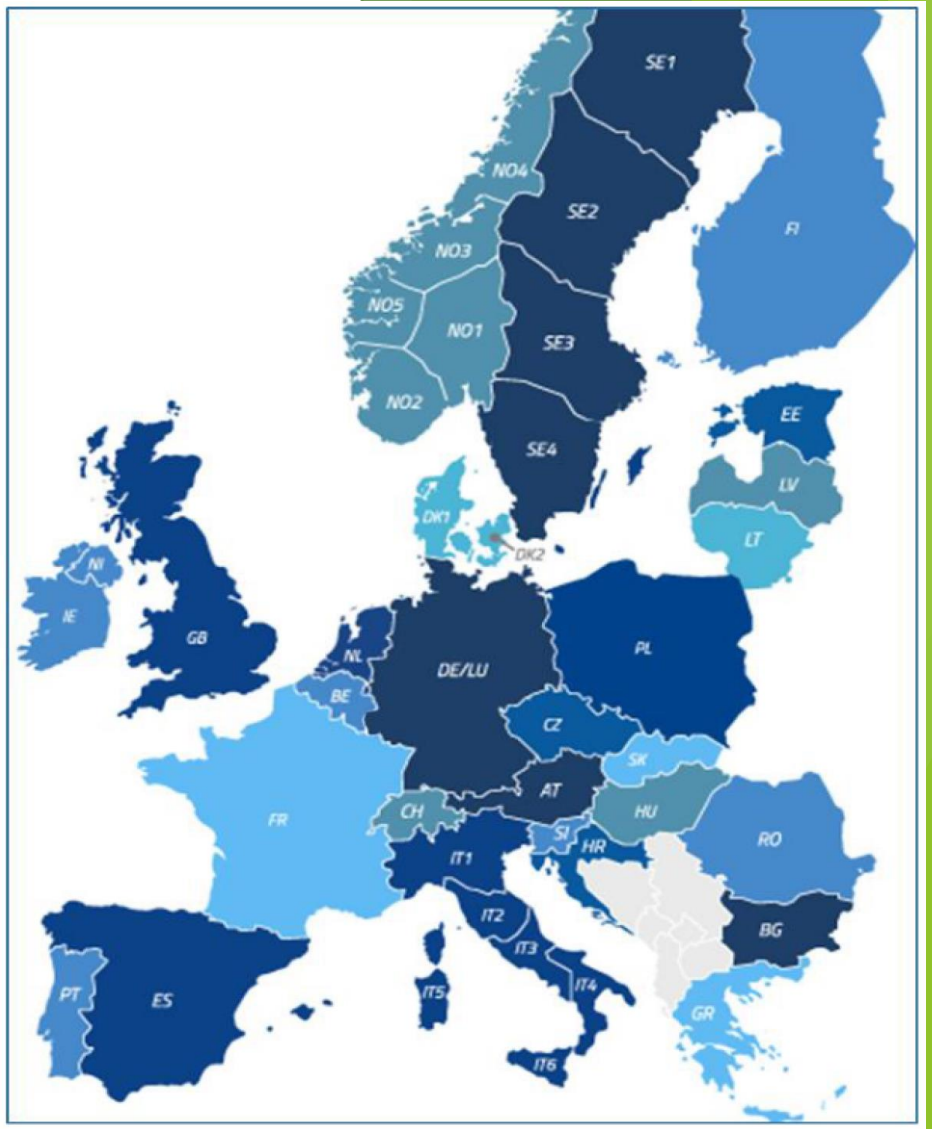
Market Integration: Facilitating seamless electricity trade across national borders.

Cross-Border Cooperation: Promoting collaboration among European energy stakeholders.

Unified Regulatory Framework: Aligning rules and standards across member states.

Renewable Energy Integration: Prioritizing clean energy in market operations.

Robust Market Design: Ensuring transparency, flexibility, and resilience in energy systems.



Source : ACER

Electricity & Gas price gap for industry

Source: European Commission, 2024. Based on Eurostat (EU), EIA (US) and CEIC (China), 2024.

What Drives the Energy Price Gap?

1. Energy Source and Supply Dependence

- **Natural Gas in Europe's Energy Landscape:** Europe imports around 55% of its energy, with LNG playing a key role in enhancing supply diversity, while also being influenced by global market conditions.
- **Global Fuel Cost Advantage:** The U.S. benefits from cheap shale gas, China relies on subsidized coal, keeping their energy prices lower.

2. Regulatory and Environmental Costs

- **Carbon Pricing (EU ETS):** EU ETS averaged 64.7 €/t in 2024, adding approximately **a)** 25-30 €/MWh to CCGTs, **b)** 65-70 €/MWh to Coal-fired PP and **c)** 80-90 €/MWh to lignite-fired PP
- **Energy Taxes and Green Levies:** National surcharges and legacy renewable support schemes can add 27–37% to industrial power bills.

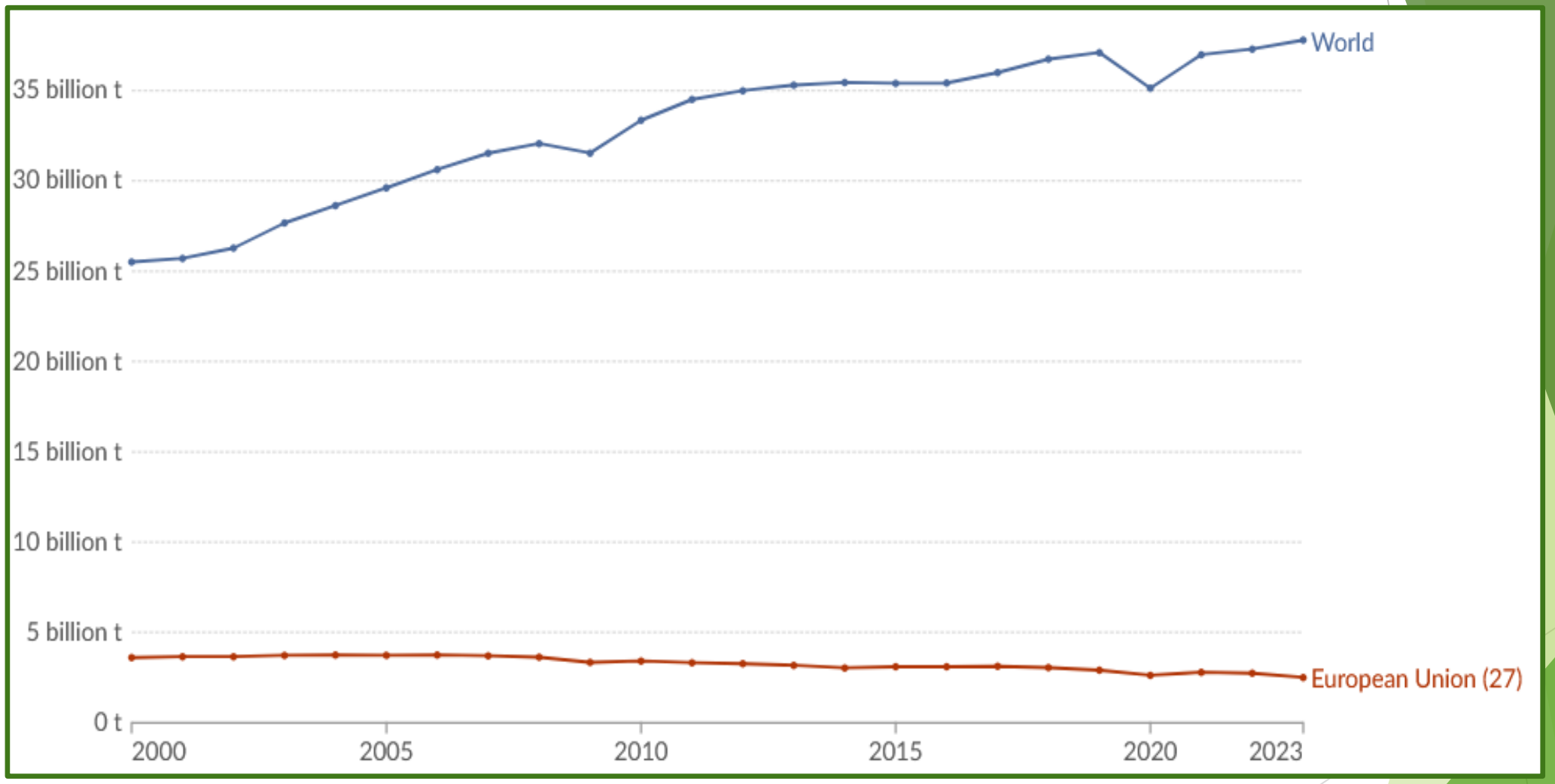
3. Infrastructure and Market Design

- **Grid and Congestion Charges:** Investments in renewable integration drive up network costs, which can account for up to 29% of electricity bills.
- **Nuclear Phase-Outs:** French outages + German nuclear exit tightened baseload, reinforcing the critical role of gas in maintaining energy stability.

4. Market and Policy Distortions

- **Legacy Contracts:** Some firms are still locked into high-cost 2022 contracts, delaying relief from falling prices.
- **Varied Industrial Support Approaches:** Different global regions employ distinct strategies for supporting energy-intensive industries, with some markets providing more comprehensive industrial tariff protections and energy subsidies than others, creating varying competitive conditions across global markets.

Annual CO_2 emissions (2000-2023)



EU share of global GHG fell to ≈6 % in 2023 (from 6.8 % in 2022)

Market & Analyst Perspectives

1. Economic and Industrial Impact

- **Relocation Pressure:** 37% of German firms, 45% in energy-intensive sectors, are considering production cuts or relocation (DIHK survey).

2. Price Volatility and Market Dynamics

- **Gas Price Spikes**: Dutch TTF front-month gas hit €49/MWh in January 2025, double the previous year, before easing in spring.
- **Volatility Spillovers:** Cross-border electricity price volatility in Europe has doubled from 2014 to 2024 (IMF study).
- **Negative-Price Hours**: Germany recorded 475 negative-price hours in 2024 (vs. 301 in 2023), indicating growing solar "cannibalisation."

3. Regulatory and Policy Developments

- **EU ETS Outlook**: BloombergNEF projects EU carbon prices to reach ~€149/tCO_2 by 2030 under ETS II.
- **CBAM Implementation**: Starting in 2026, importers must buy certificates for both direct and indirect emissions, raising costs for exporters.

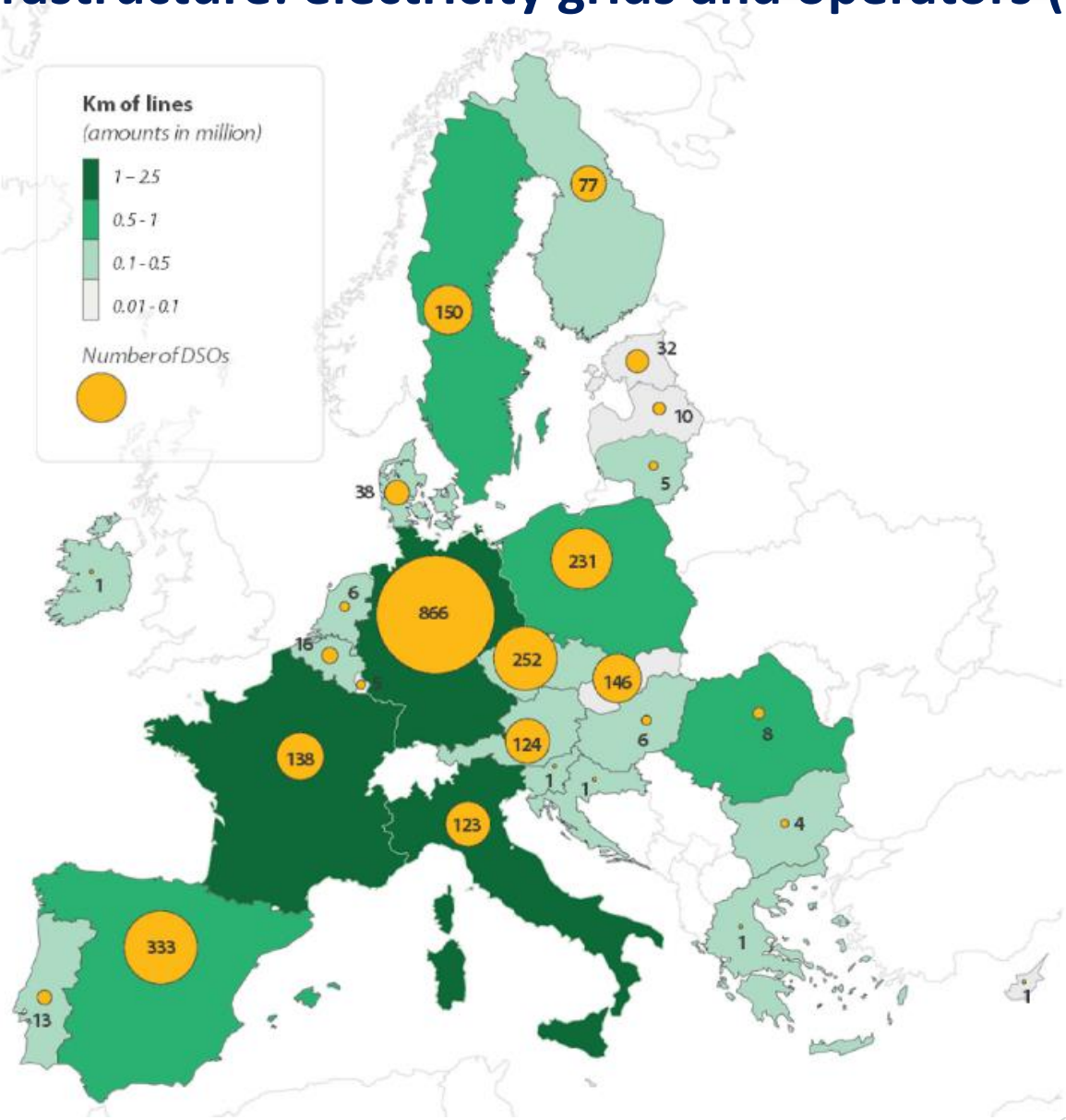
4. Infrastructure and Systemic Risks

- **Congestion Costs:** EU grid congestion cost €4.26 billion in 2023 (ACER).
- **Grid Investment Gap:** Over €1 trillion in upgrades is needed to prevent outages as renewable integration accelerates.
- **Iberian Blackout:** A 15 GW drop on April 28, 2025, tripped the France–Spain link, causing a blackout in Spain and Portugal.

5. Utility and Market Outlook

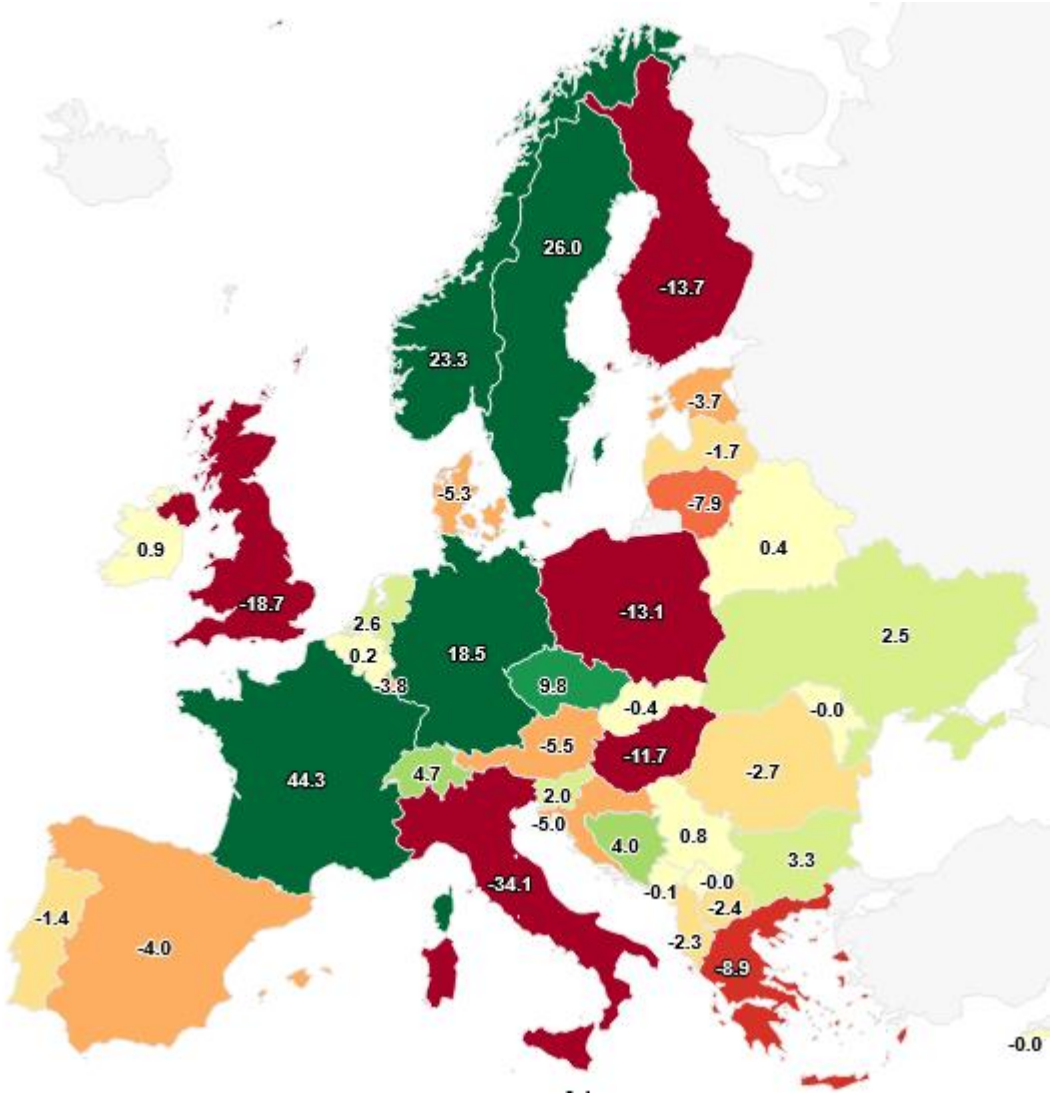
- **Utility Forecast:** Fitch and other analyst expect a gradual stabilization and even normalization of European gas prices through 2026-2027.

The largest EU infrastructure: electricity grids and operators (2024)

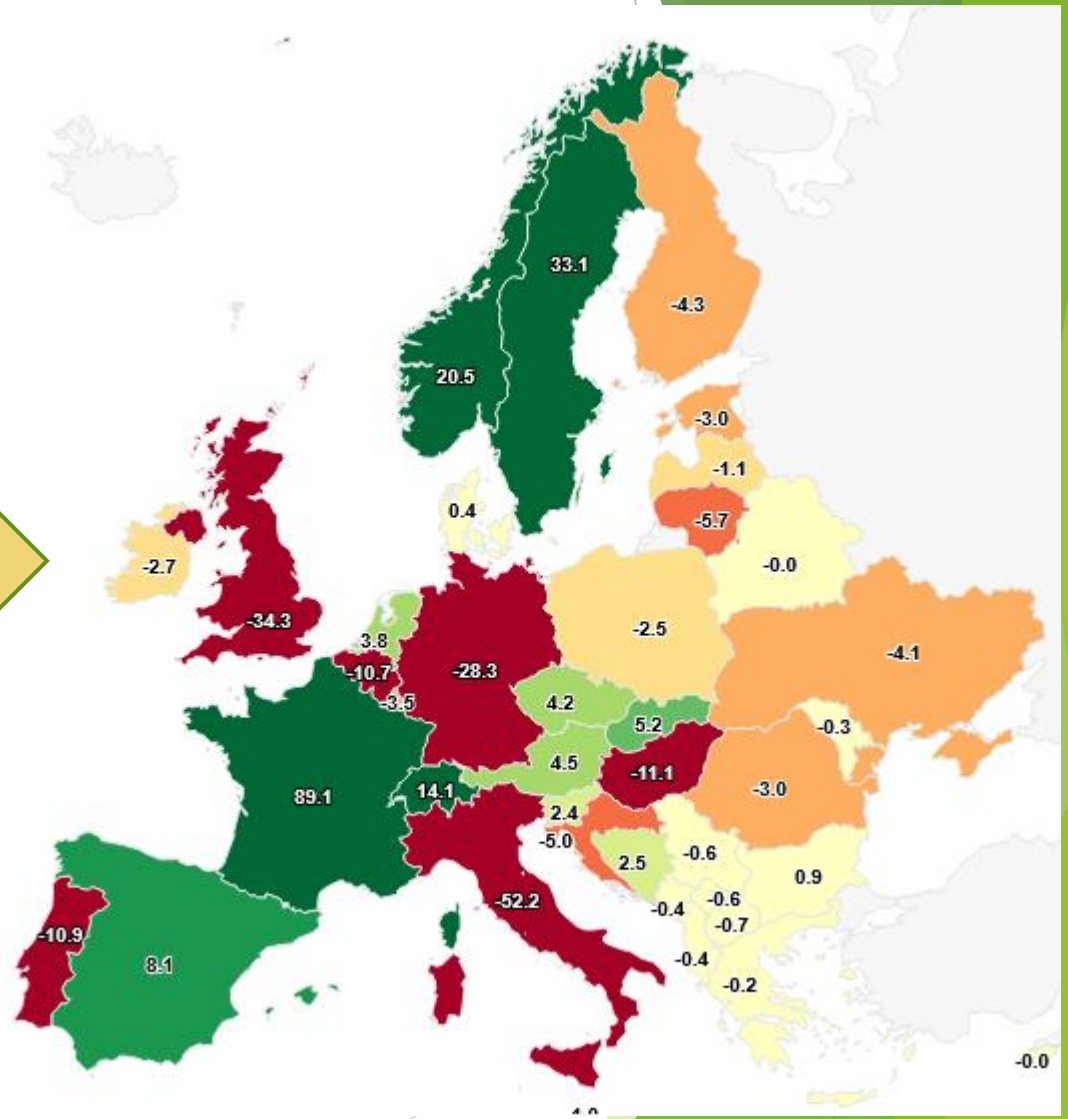


The European Commission estimates more than 1 trillion € of grid investment is needed by 2050 to avoid Spain-style blackouts

Cross border electricity trading in 2020

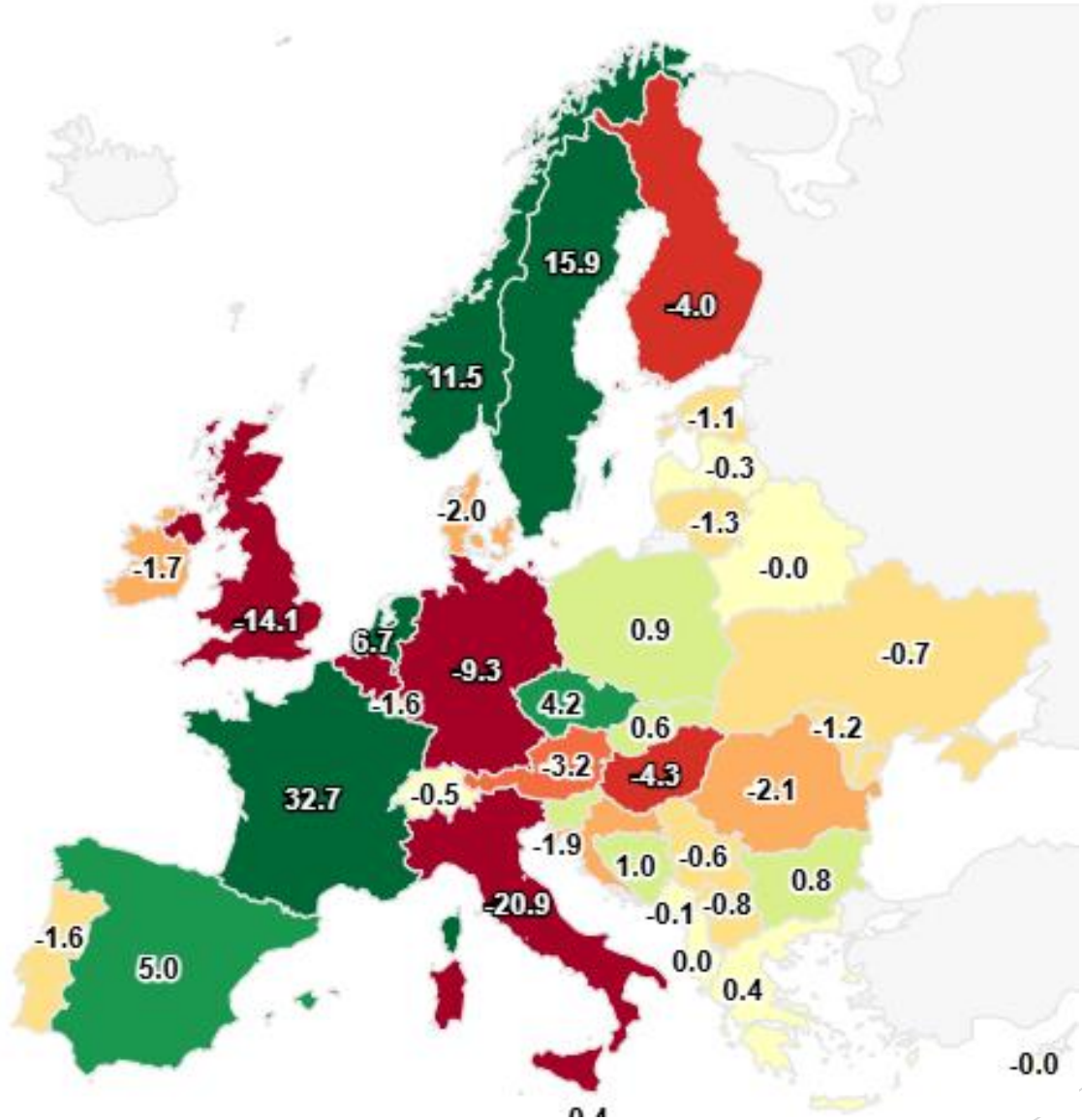


Cross border electricity trading in 2024



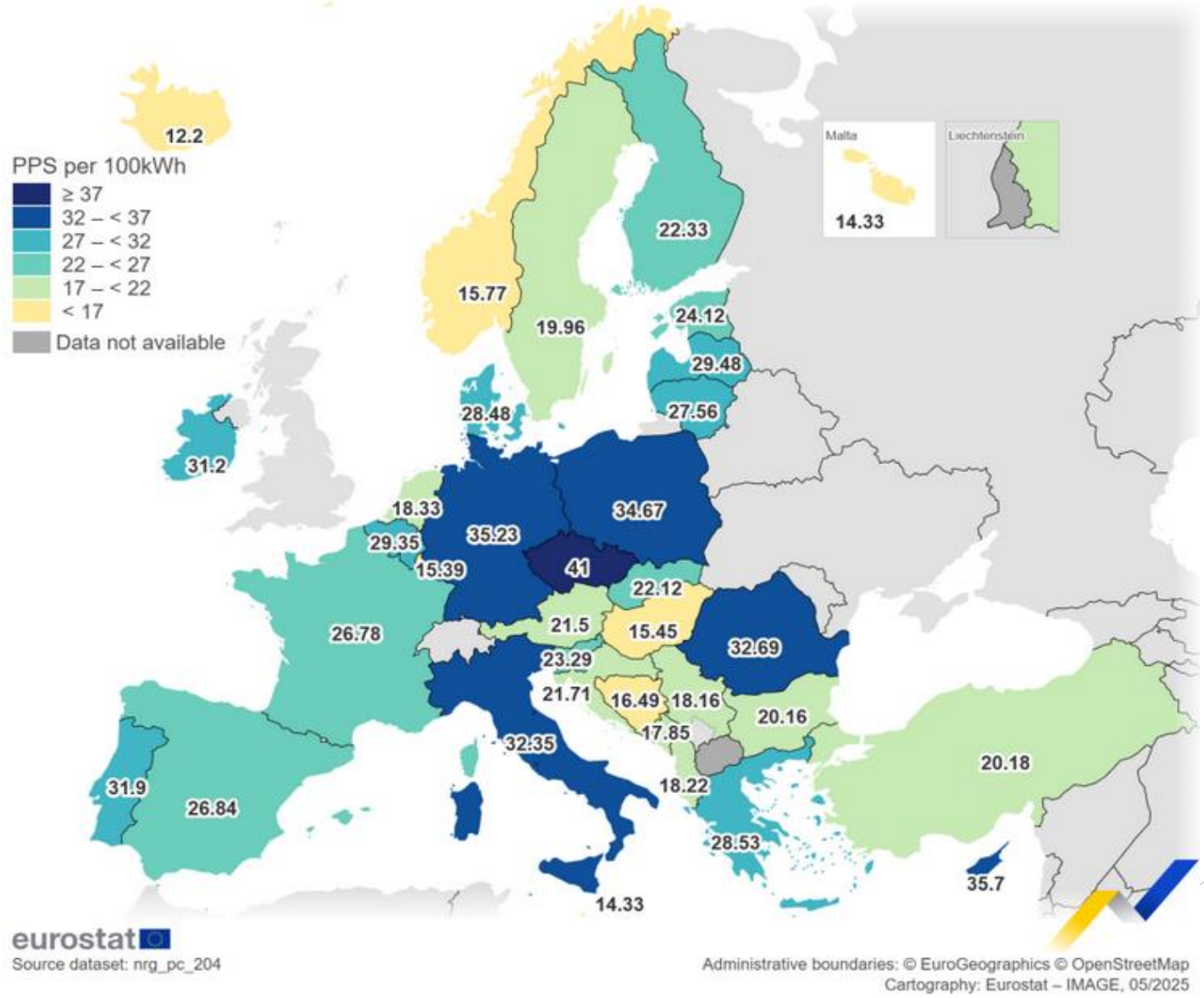
In TWh, positive values (green) mean exports, negative values (red) mean imports

Cross border electricity trading in 2025 (up to 07/06)

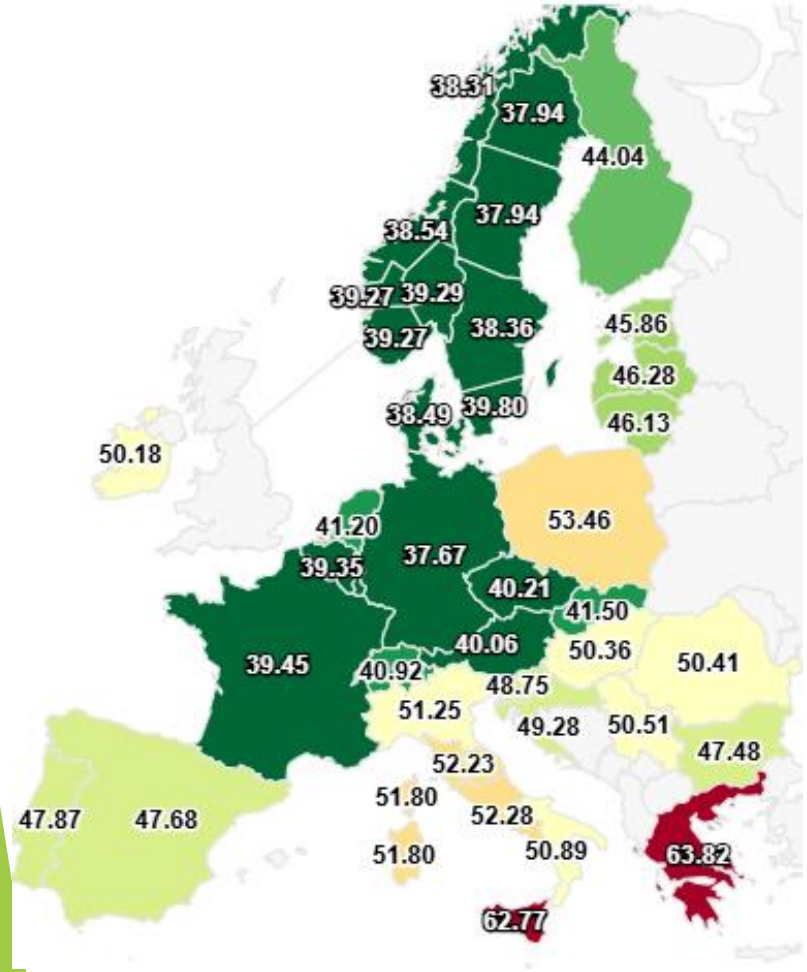


Source: Energy-Charts.info

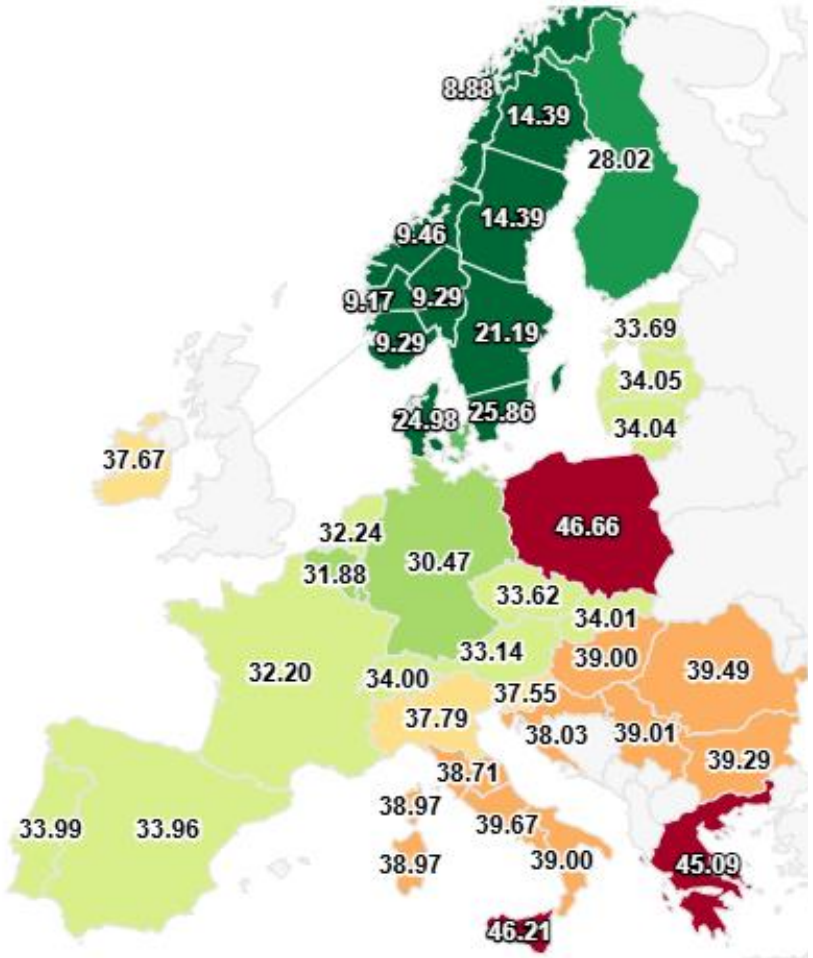
Electricity prices for household consumers, second semester of 2024
(purchasing power standards (PPS) per 100 kWh)



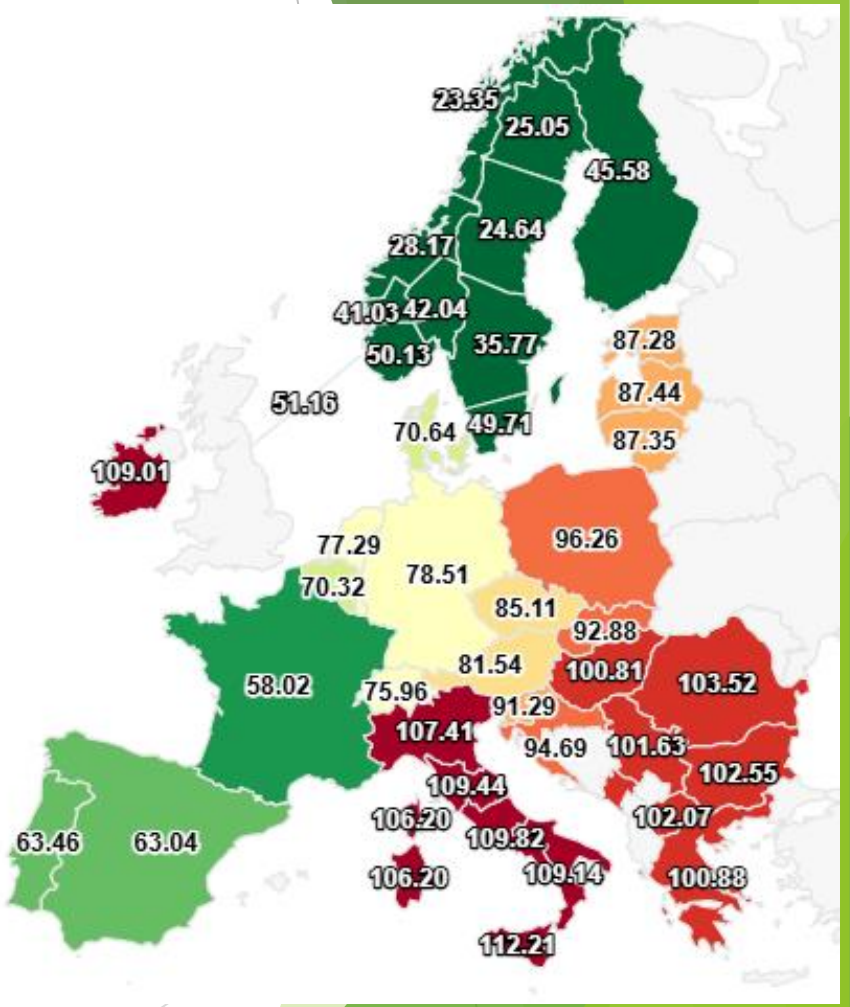
Day Ahead prices in 2019



Day Ahead prices in 2020



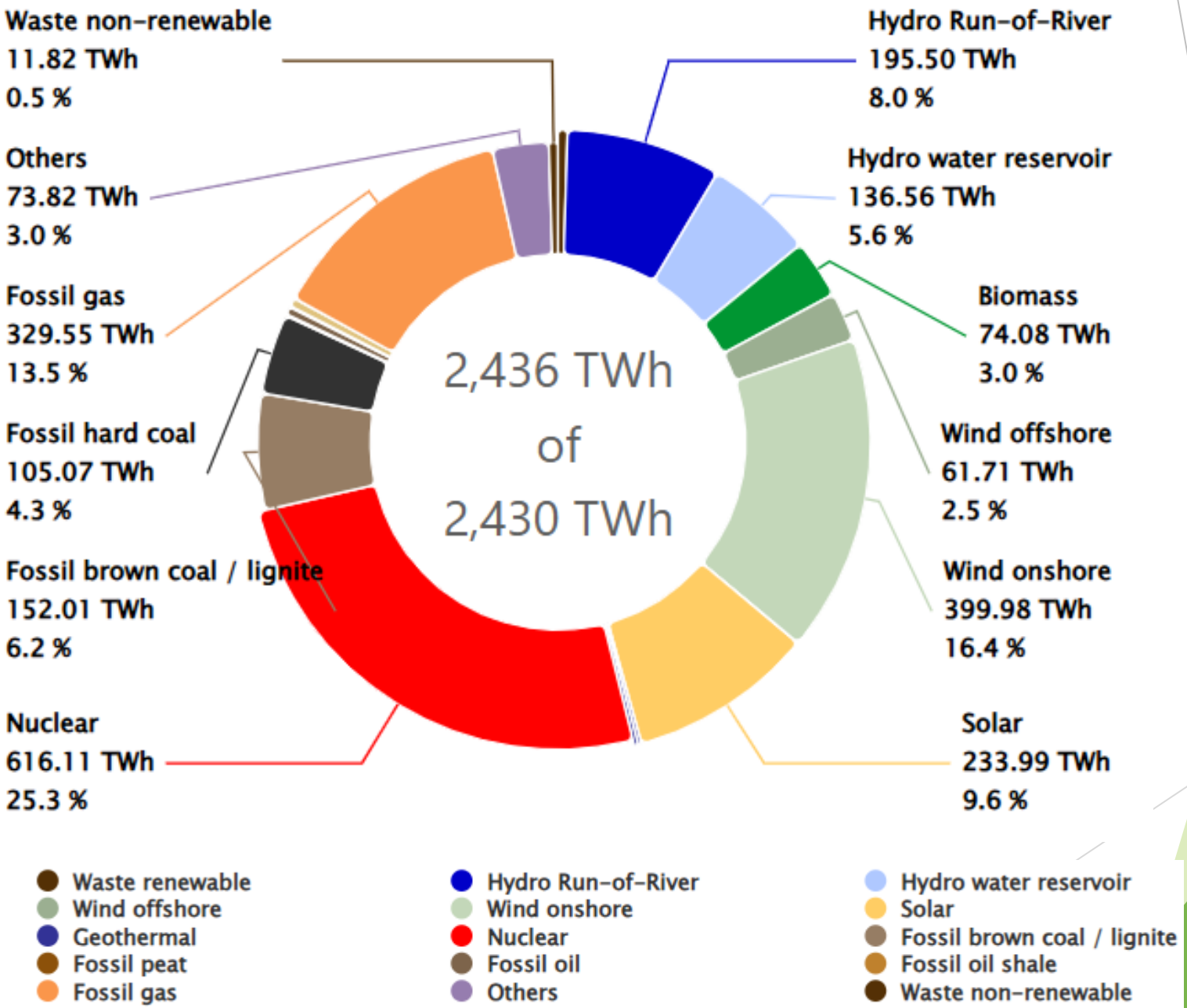
Day Ahead prices in 2024



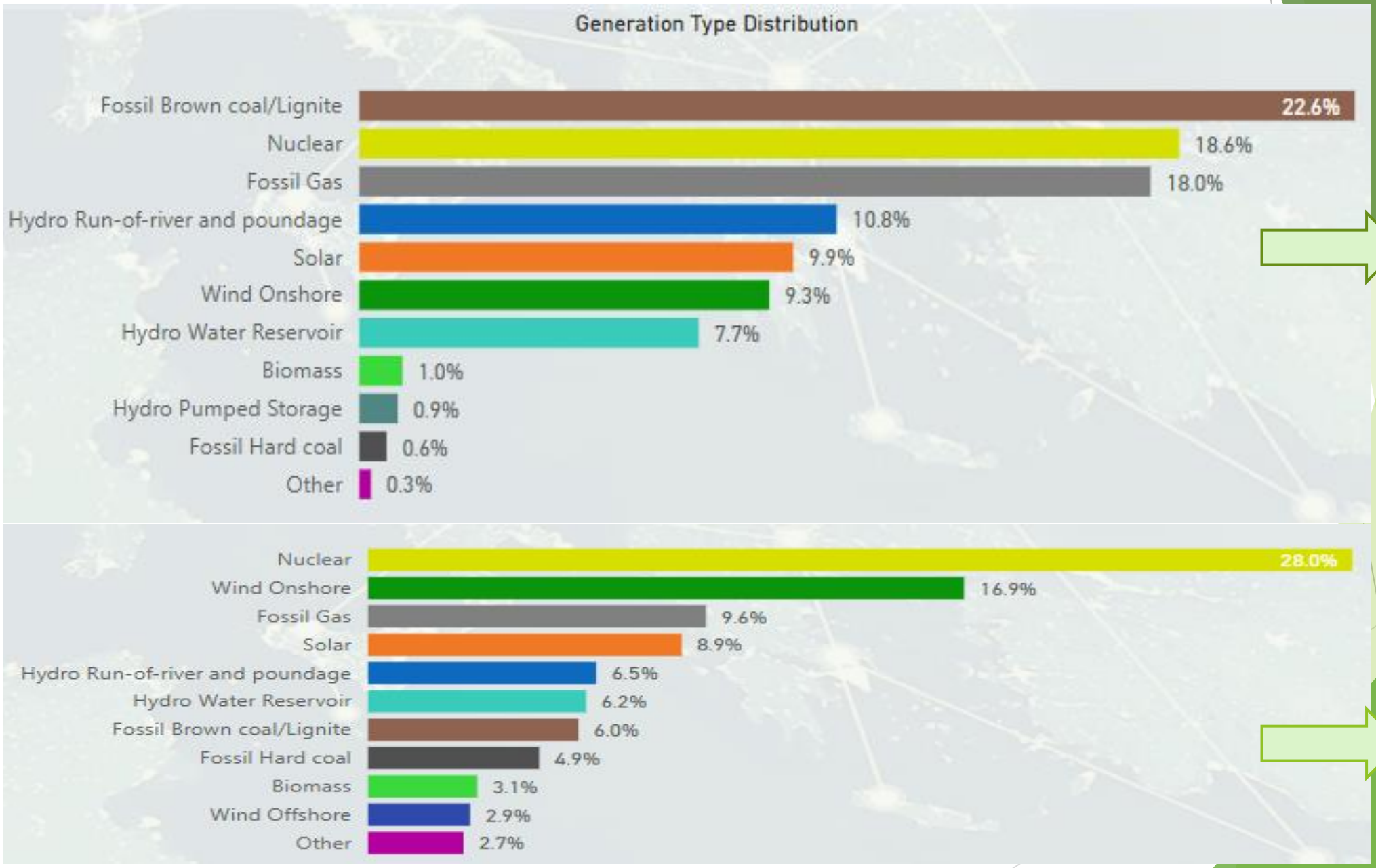
In the first five months of 2025, Greece recorded one of the lowest DAM prices in the region, including Italy, by a margin of €1–9/MWh. In just six years, Greece transitioned from a high-cost energy market to a competitive one

Source: Energy-Charts.info

Electricity generation in the EU27 in 2024



Energy Mix SEE vs EUROPE (w/o SEE & Italy)



SEE

- Greece
- Bulgaria
- Albania
- Romania
- Bosnia Herz
- Croatia
- Hungary
- FYROM
- Serbia
- Slovenia

EUROPE w/o SEE & Italy

Decoding Energy Market Stressors in Southeast Europe (1)

1	**Carbon-heavy power mix**	Coal still makes 60-70 % of WB6* electricity and about 49 % in Bulgaria, even Hungary's small coal fleet can set the marginal price when demand peaks.
2	**EU carbon rules & CBAM**	Generators pay the EU ETS price today, and from 2026 exports will also face the carbon-border tax, locking a carbon premium into regional prices.
3	**Gas price & security premium**	The 1 Jan 2025 stop of Russian gas via Ukraine re-priced CEE hub contracts, lifting Hungarian spark-spread offers.
4	**Hydropower Constraints**	Several countries depend on hydro, 2024 saw below-average rainfall
5	**Old coal plants & outages**	Western Balkan lignite units average 47 years old. Surprise outages tighten supply and spike prices.
6	**Regulatory Interventions**	Governments introduced temporary measures to stabilize markets, which may have influenced price signals and investment dynamics
7	**Retail price caps**	Ad-hoc retail price caps discourage long-term hedging, shifting risk and steepening the short-run supply curve in spot
8	**Grid bottlenecks & congestion costs**	SEE-CEE borders trade < 1 GW. The RO–HU line releases only 33 % of capacity, while AT–HU curtailments to 0 MW leave Hungary isolated. Congestion management cost the EU €4 bn in 2023.
9	**New but thin market coupling**	WB6 exchanges linked to the EU day-ahead only in 2023-24, low liquidity means price convergence on those borders is still < 15 %.
10	**Price-shock spill-overs**	Hungary shows the highest cross-border price-volatility "spill-over" index in the EU, so any neighbour's shock quickly hits HUPX.

***WB6: Albania, Bosnia-Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia.**

Decoding Energy Market Stressors in Southeast Europe (2)

11	**Distribution Losses**	Across the Western Balkans, technical and non-technical distribution losses range from 12–24%, roughly double the EU average
12	**Interconnection Capacity**	As of early 2024, cross-border interconnection levels in Balkan states averaged only 5–10% of installed generation, well below the EU 2030 target of 15%, creating persistent bottlenecks and limiting imports of lower-cost surplus power from Austria, Italy etc
13	**NTC vs FBMC**	Balkan grids rely on a Net Transfer Capacity (NTC) approach, setting static, separate limits on each border. By contrast, Flow-Based Market Coupling (FBMC) models physical flows across multiple borders simultaneously
14	**Low Liquidity**	National exchanges (HUPX, HENEX, SEEPEX, IBEX, OPCOM) operate at low liquidity: HUPX traded 2.64 million MWh in January 2025 versus tens of TWh in major Western European exchanges
15	**Currency risk**	Utilities buy fuel in euros or dollars but recover costs in weaker local currencies, so they build in a buffer against FX swings.
16	**Electricity Imports to Ukraine**	From winter 2022 onward, Ukraine became a net importer, drawing up to 1,200 MW from Hungary on peak days, reducing regional availability and pushing domestic prices higher
17	**Geopolitical Risks**	Dependence on Russian gas via TurkStream and Gazprom's stake in Serbia's NIS exposed the region to supply disruptions and price volatility, amplifying a "sovereign risk premium" on Balkan hubs relative to core EU
18	**Blackout on 21 June 2024**	Intense heat (over 40 °C) triggered cascading line tripping, leaving Albania, Bosnia & Herzegovina, Montenegro, and parts of Croatia without power for ~3 hours, exposing fragility due to limited interconnections and outdated assets

Thank you for attending!