ACER

European Union Agency for the Cooperation of Energy Regulators

Annual report on ACER market monitoring efforts & broader ACER planning

The European Parliament's ITRE Committee

Brussels, 3 December 2024

Christian Zinglersen, *ACER Director*

ACER
European Union Agency for the Cooperation of Energy Regulators

Agenda

Status of EU energy markets

- *Electricity*
- *Gas*
- *Hydrogen*

EU competitiveness & energy

- *Leveraging our internal energy market*
- *Digitalisation and flexibility*
- *Addressing rising energy system costs*

ACER planning, priorities & needs up ahead

ACER
European Union Agency for the Cooperation of Energy Regulators

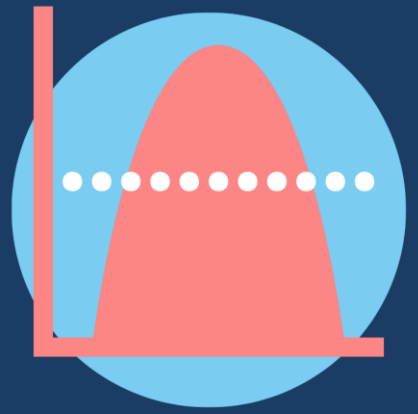
Briefly on EU markets: Electricity

ACER
European Union Agency for the Cooperation of Energy Regulators

Member States benefit from market integration

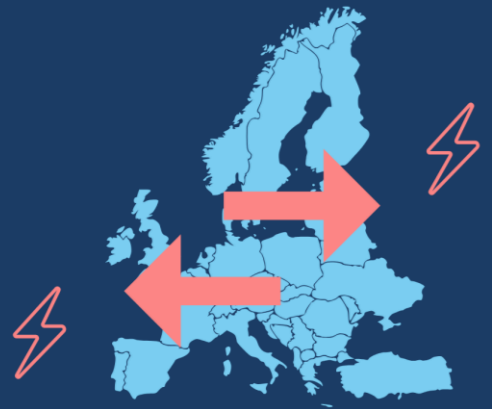
30 – 50%

Currently available capacity for cross-border trade in meshed areas

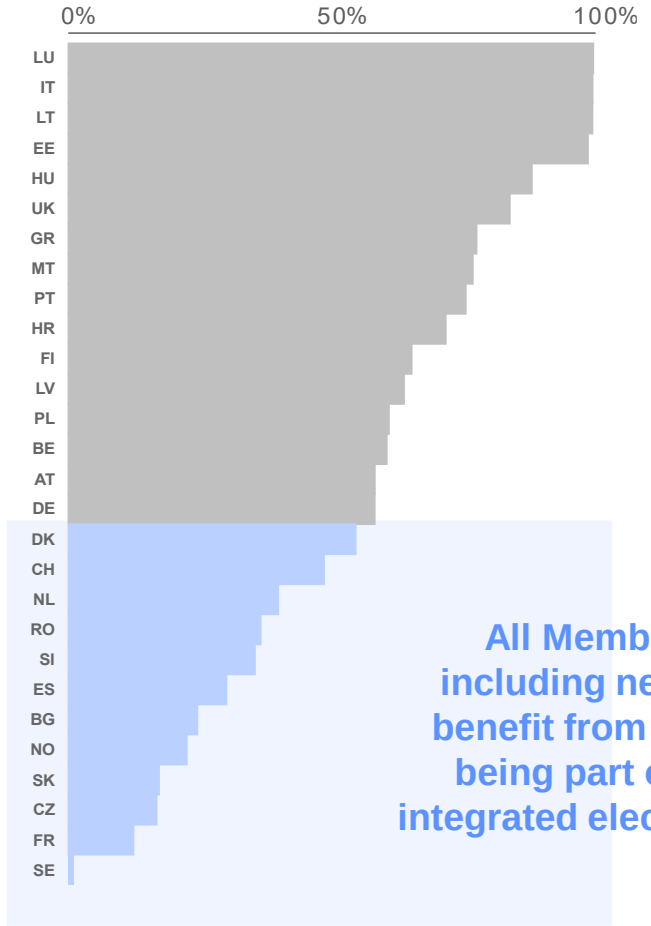


70 %

Minimum 2026 target for capacity available for cross-border trade



Percentage of electricity net import hours in the EU-27/EEA(Norway), Switzerland, 2023



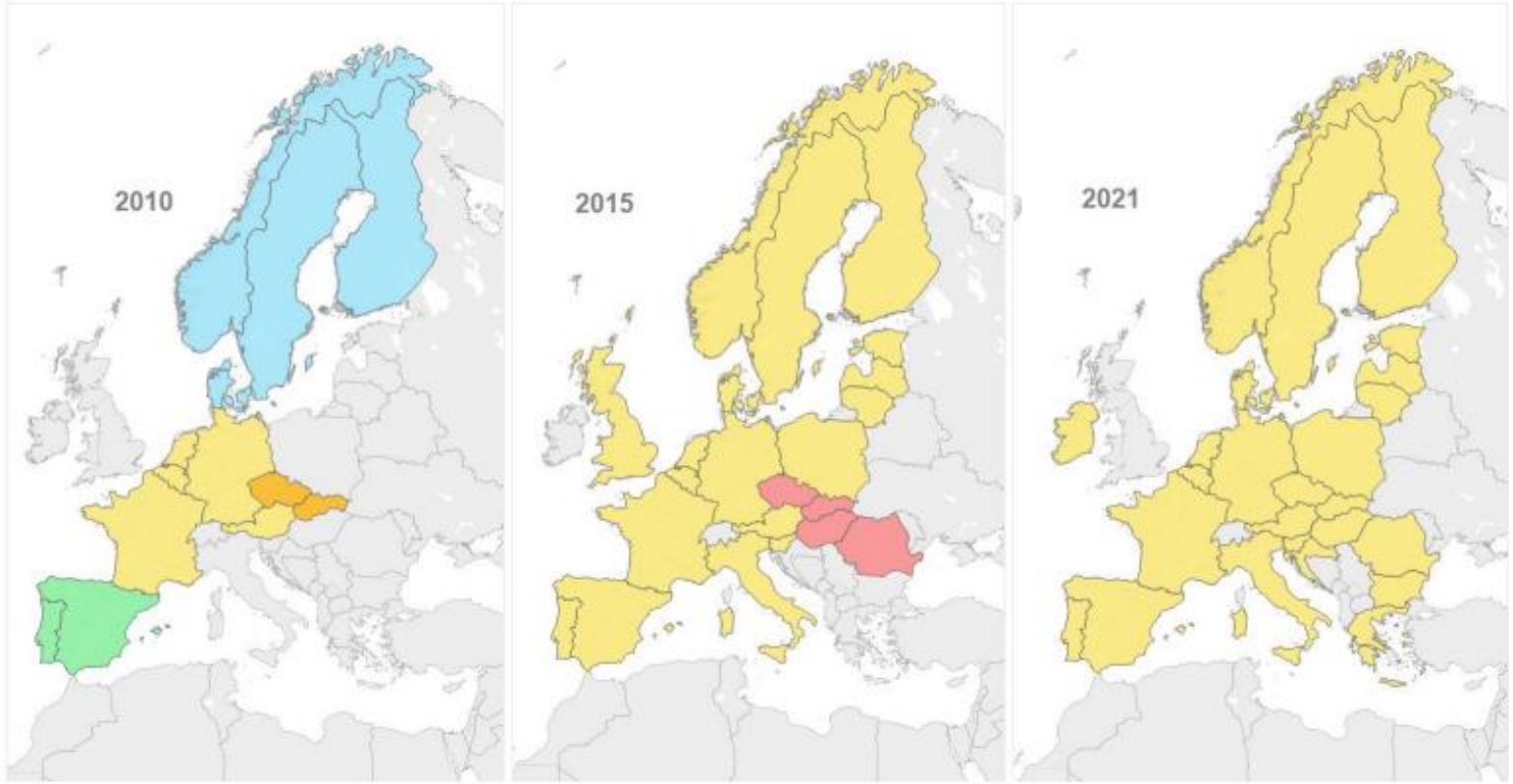
All Member States, including net exporters, benefit from imports and being part of Europe's integrated electricity market.

Source:ACER Opinion on the minimum cross-zonal capacity requirements, April 2024 and ACER's report on key developments in the electricity market, March 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

The benefits of integrated electricity markets

Evolution of EU wholesale electricity day-ahead market coupling, 2010-2021



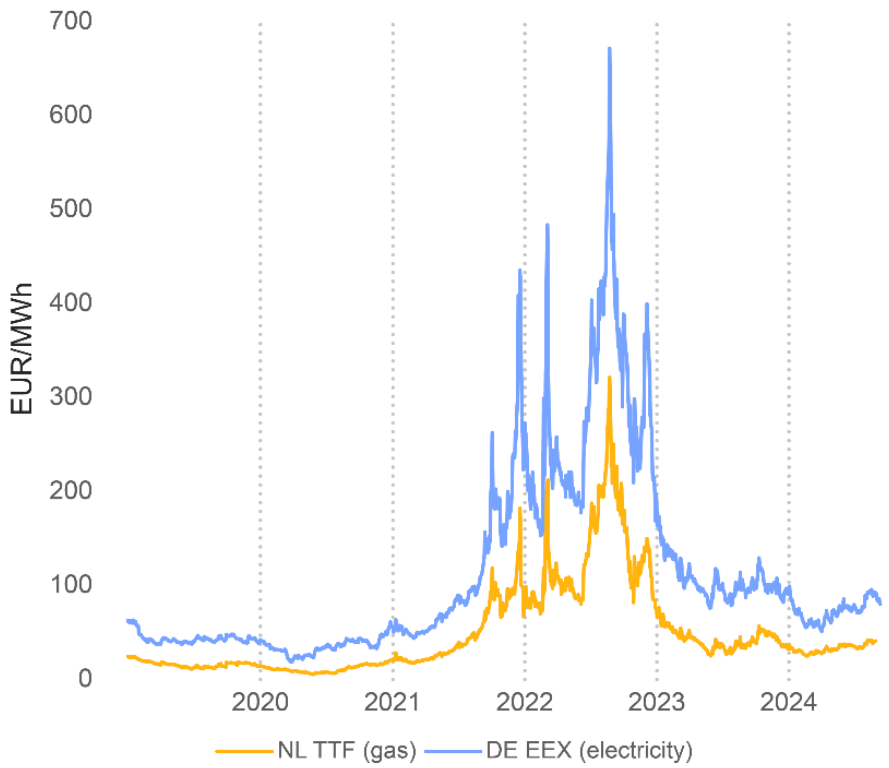
How large are the benefits from cross-border trade in the EU?

Source: ACER's assessment of the EU Wholesale Electricity Market Design, April 2022.

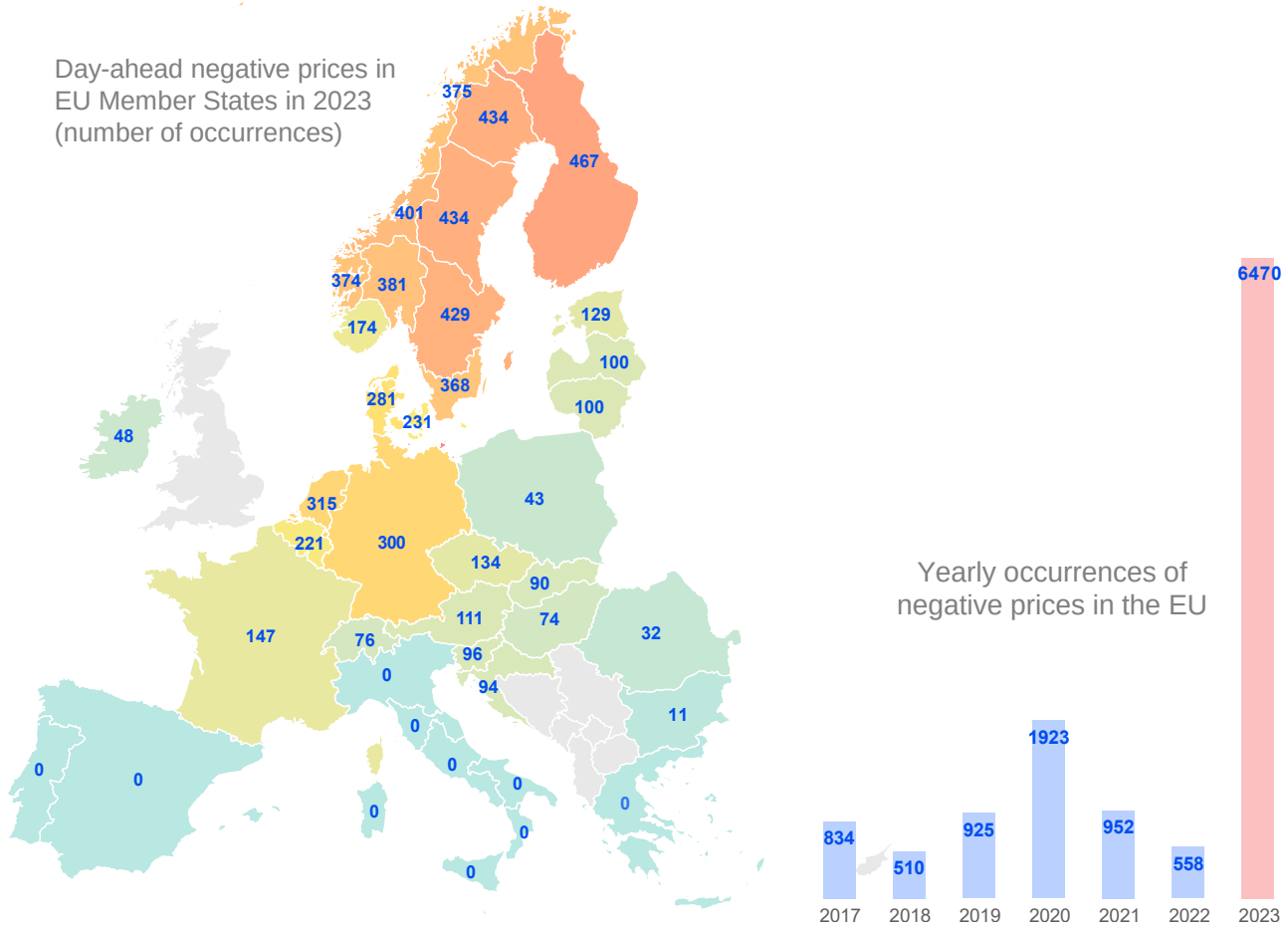
ACER
European Union Agency for the Cooperation of Energy Regulators

Recent years showing high price volatility

EU gas and electricity prices, 2021–2024 (EUR/MWh)



Unprecedented record of negative prices

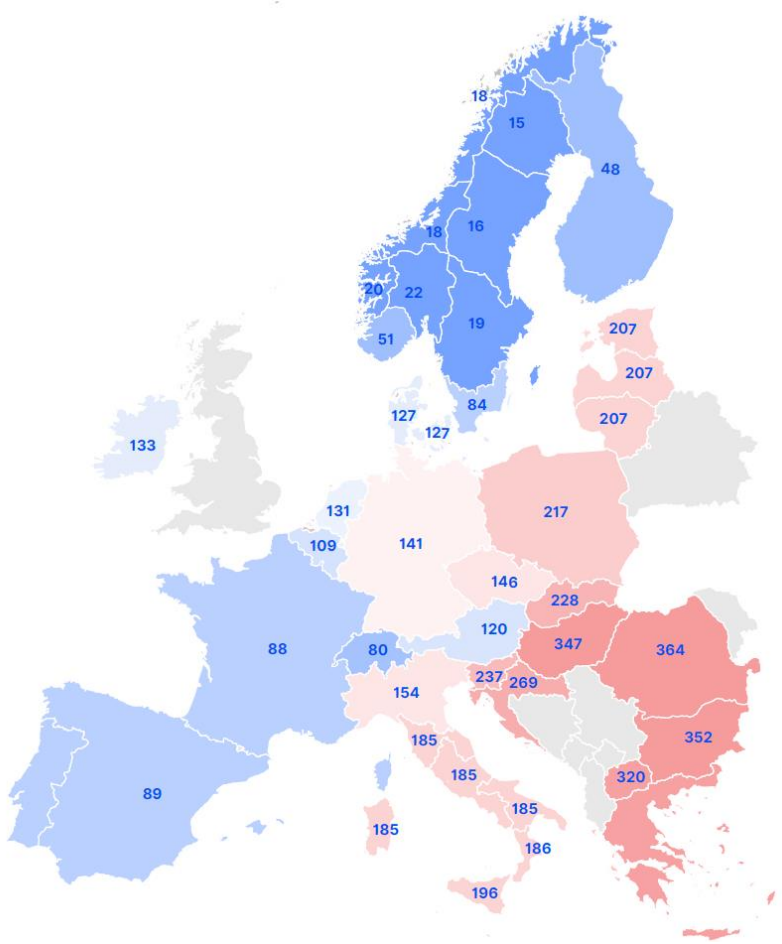


Source: ACER's report on key developments in the electricity market, March 2024.

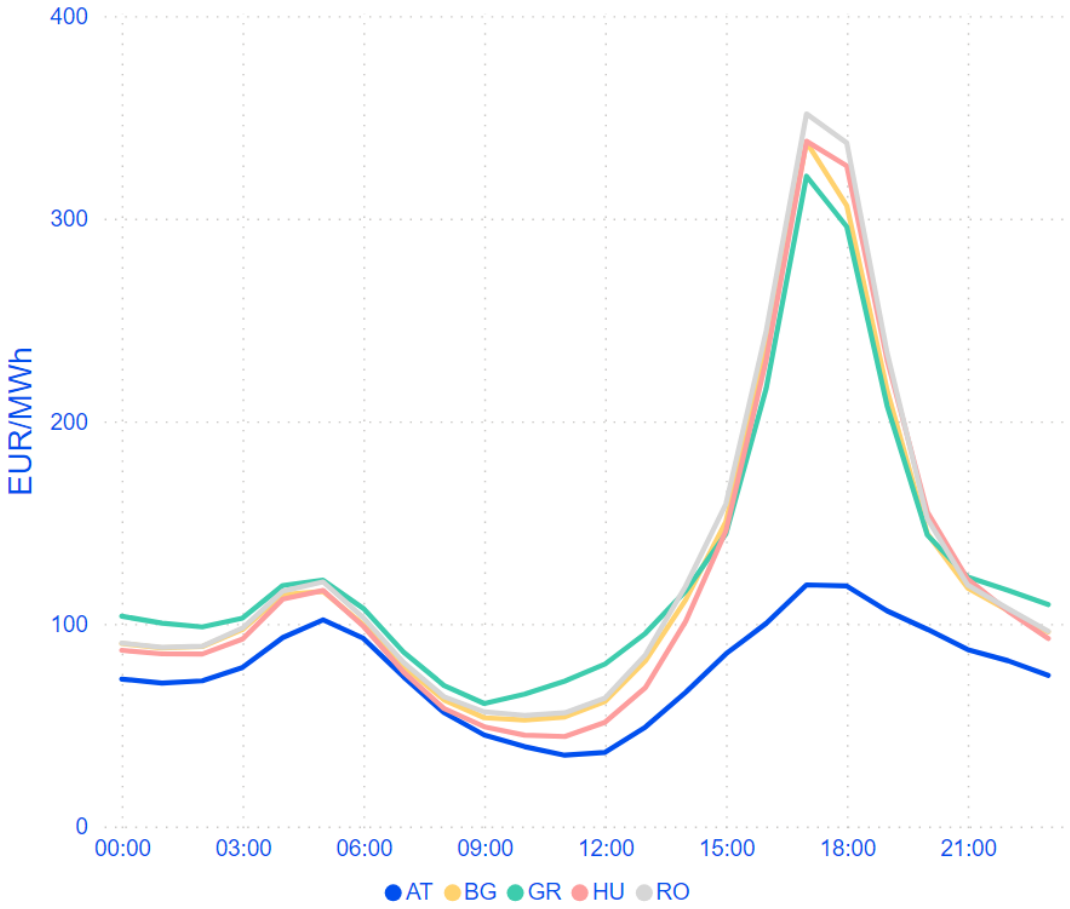
ACER
European Union Agency for the Cooperation of Energy Regulators

Zooming in on ‘summer developments’

Average day-ahead prices in the EU at 19:00 CET, 1 July-23 September 2024 (EUR/MWh)



Evolution of average day-ahead prices in select EU bidding zones, July-September 2024 (EUR/MWh)



Source: ACER calculations based on ENTSO-E’s transparency platform, 25 September 2024.

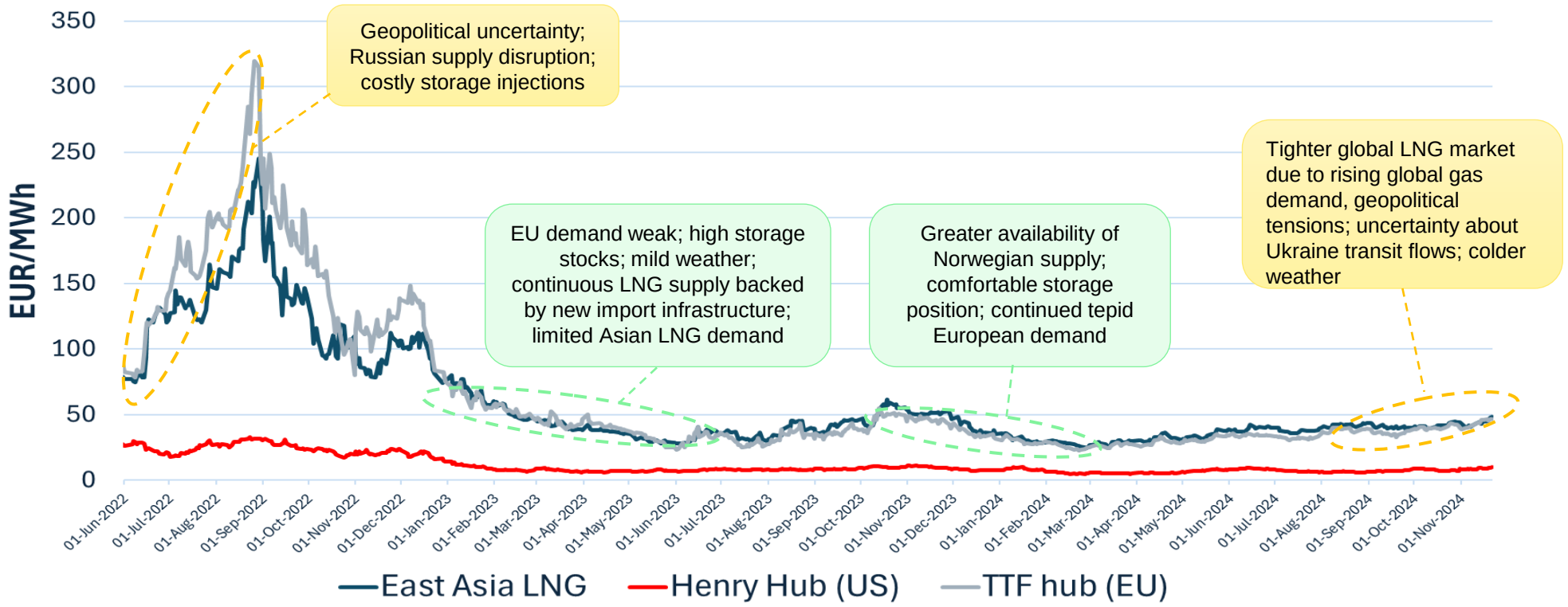
ACER
European Union Agency for the Cooperation of Energy Regulators

Briefly on EU markets: Gas

ACER
European Union Agency for the Cooperation of Energy Regulators

Gas markets are evolving

Global gas benchmark prices, month ahead product, June 2021-November 2024 (EUR/MWh)



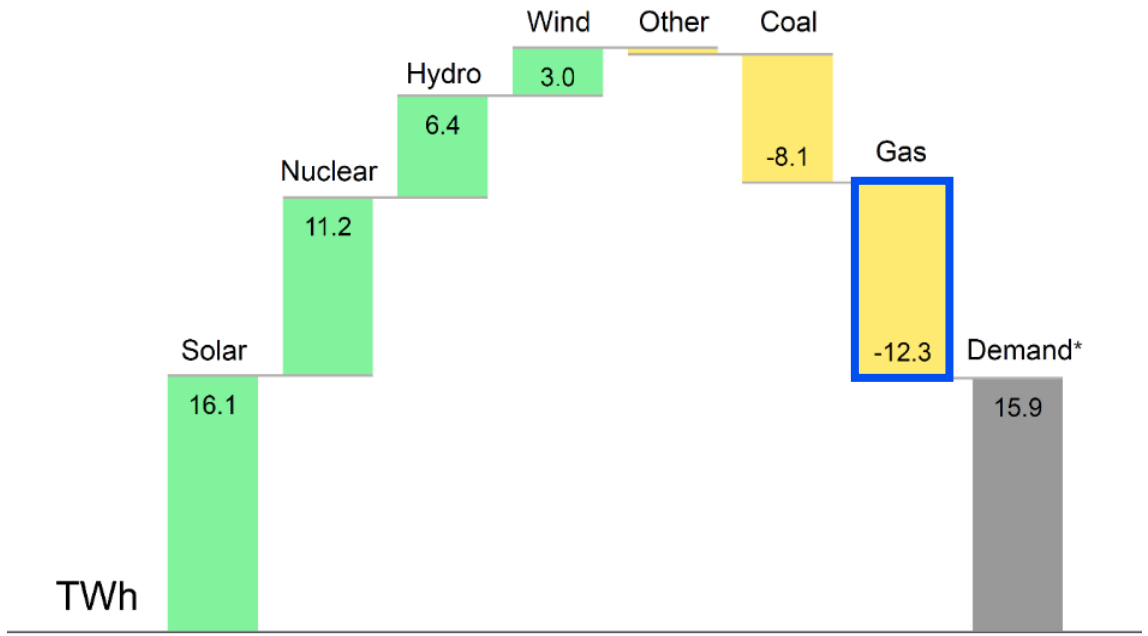
The EU has largely returned to a more stable gas supply, supported by reducing demand, ample LNG import capacity and adequate storage levels. However, this balance remains fragile.
An anticipated surge in LNG supply from late 2026 is expected to drive prices down.

Source: ACER based on ICIS Heren.
Note: The Dutch Title Transfer Facility gas hub (TTF) and the United States Henry Hub are used as benchmarks for European and American gas prices respectively.

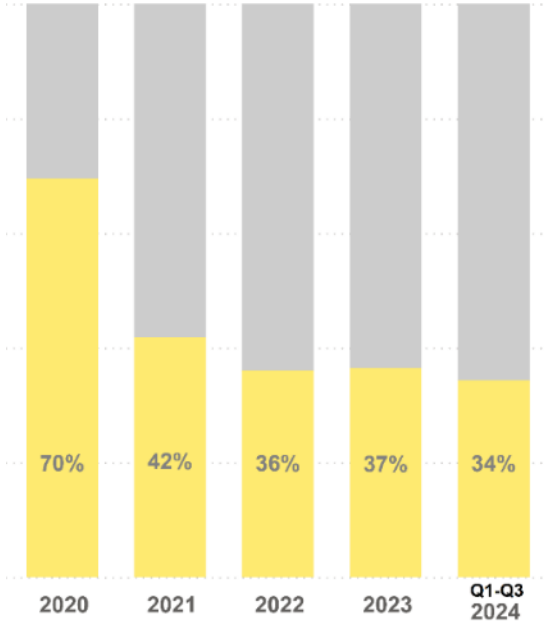
ACER
European Union Agency for the Cooperation of Energy Regulators

Trend of renewables displacing gas generation

Year-on-year change for main electricity generation technologies, Q3 2024 (TWh)



Percentage of hours when electricity day-ahead prices were above costs of producing electricity from gas on average in the EU-27, Q1-Q3 2020-2024 (%)



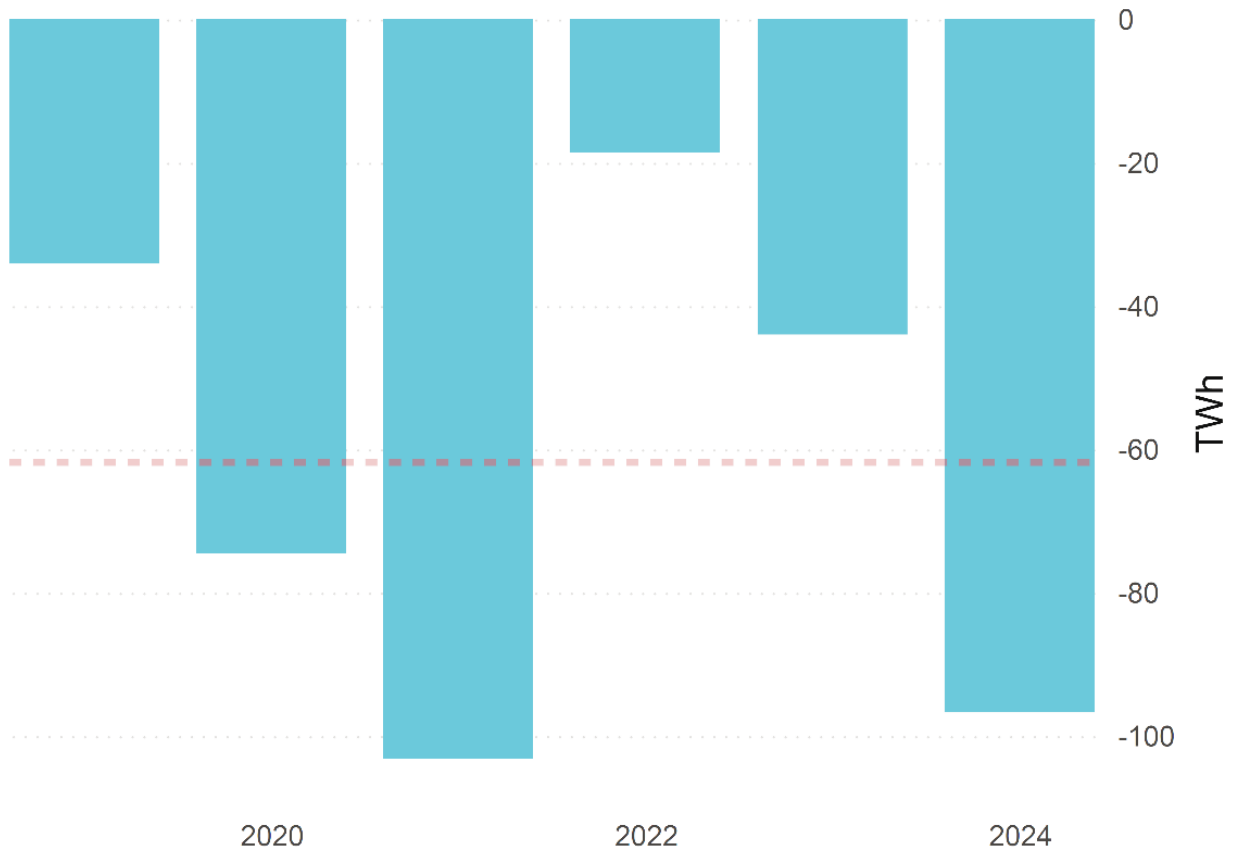
Compared with the same period last year, gas-fired power generation in the EU declined by 12 TWh in the third quarter of 2024. Increased renewables' output limited the opportunities for conventional power plants (gas and coal) to run profitably. This resulted in reduced carbon emissions, loosened the EU gas demand-supply balance and reduced the role of gas as the marginal price setter in electricity markets.

Source: ACER calculations based on European Network of Transmission System Operators for Electricity (ENTSO-E) data.
Note: Hydro does not include hydro-pumped storage. Hydro-pumped storage, biomass and other generation sources were accounted for separately, under the category 'Other'.
'Demand' combines consumption and net imports from countries outside the EU.

ACER
European Union Agency for the Cooperation of Energy Regulators

So, less relevance of gas? Well, it depends …

EU gas storage withdrawals, November 2021-2024 (TWh)

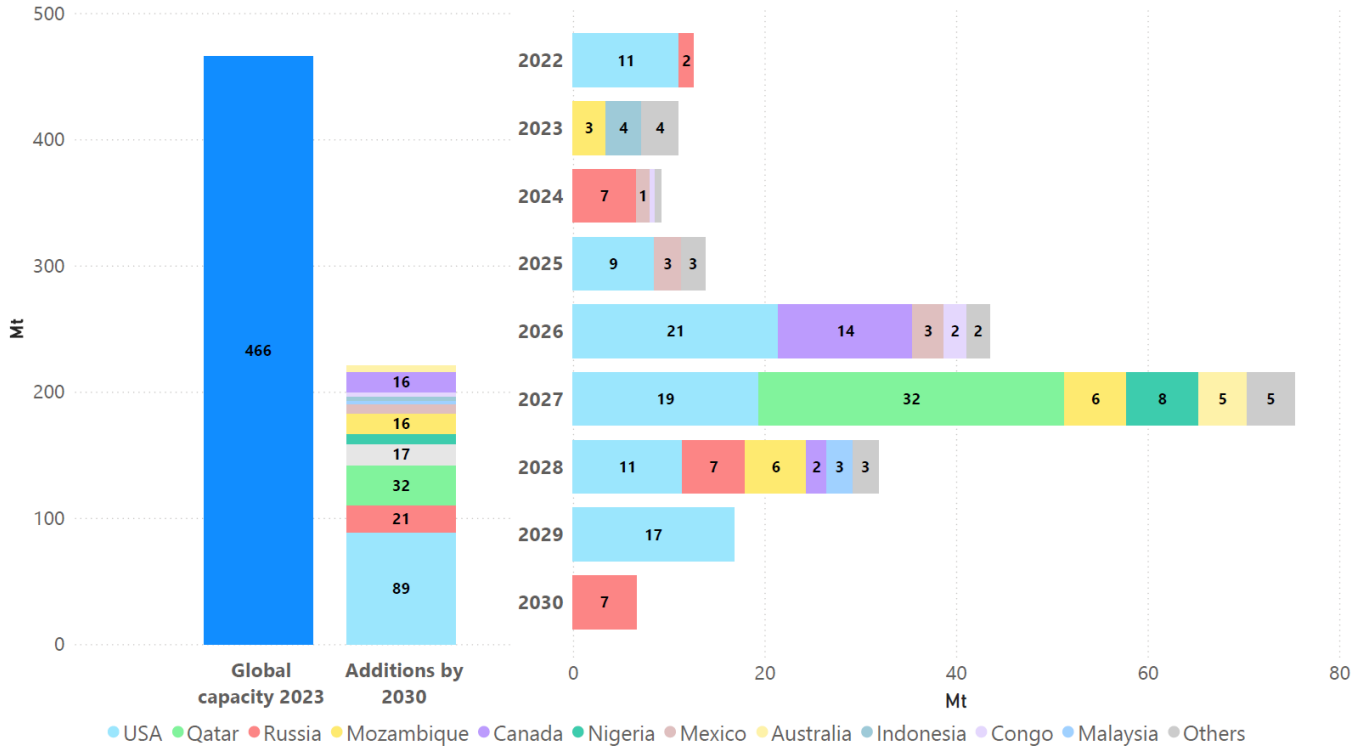


Source: ACER based on data from Gas Infrastructure Europe and ICIS, November 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Higher LNG dependence = forever-high gas prices?

New capacity developments in global LNG liquefaction, 2022-2030 (million tonnes/year)



As of February 2024, 19 liquefaction projects globally are under construction, set to boost LNG production by circa 200 million tonnes by 2030 (irrespective of the recent pause by authorities in the United States on granting new export licenses to liquification facilities). Such an increase in production capacity represents roughly half of current global traded LNG volumes and stands to reduce LNG market tightness and stabilise prices.

Source: ACER based on Platts, November 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Briefly on EU markets: Hydrogen

ACER
European Union Agency for the Cooperation of Energy Regulators

Hydrogen in Europe today ~ key figures

7.2 Mt

EU hydrogen (H_2) consumption in 2023

- 99.7% of it produced from fossil fuels
- EU likely to miss the consumption goal of 20 Mt renewable H_2 by 2030

62 GW

EU Member State's electrolyser capacity targeted for 2030

- 216 MW installed capacity in 2023
- EU likely to miss the 100+ GW needed for the 2030 10 Mt H_2 renewable production target

42,000 km

Length of planned EU+Norway H_2 network by 2034

Additional plans for:

- 693 GWh/d import capacity
- 49 TWh storage space

3-4 times

Higher production costs

- Renewable H_2 compared to fossil based H_2 discouraging early offtake

The EU needs to speed up to achieve its 2030 targets. Strong national commitments are necessary to materialise plans and projects. Current cost gap is the key barrier for renewable hydrogen uptake.

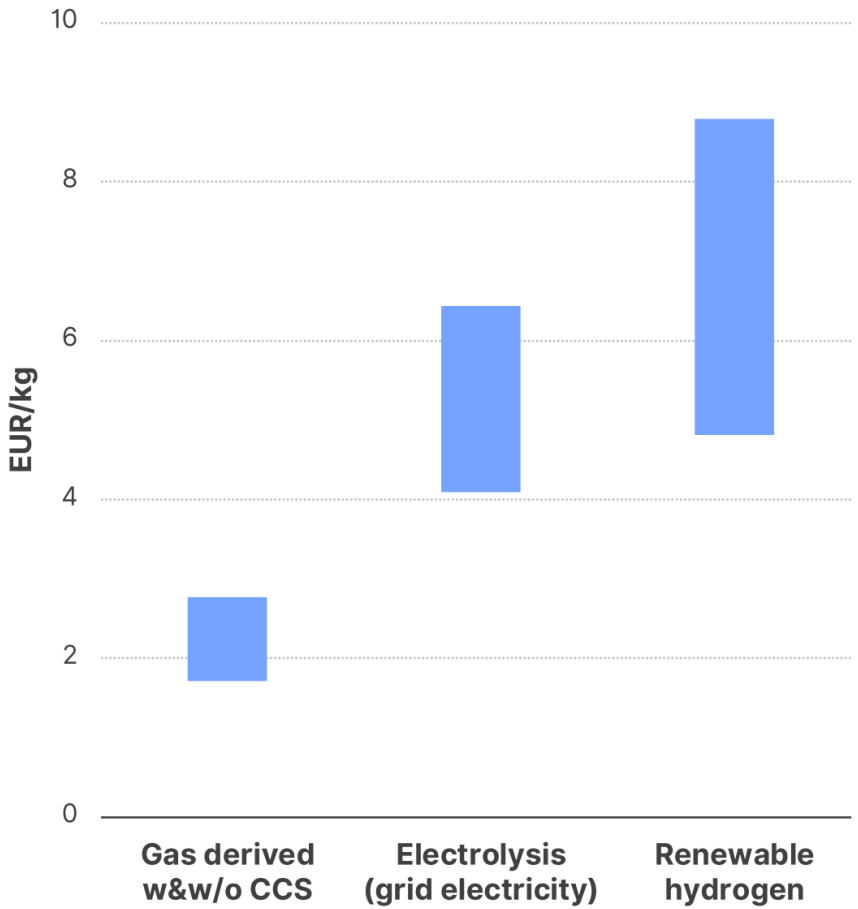
Source: ACER Market Monitoring Report on European hydrogen markets, 19 November 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Renewable hydrogen is largely ‘out of the money’

- Renewable hydrogen is 3-4 times more expensive to produce than fossil-based hydrogen.
  - Current gap is too large to enable rapid deployment.
  - Cost reduction expectations may discourage first-movers.
- Yet, European Hydrogen Bank’s first auction results indicate instances of both very low production cost and high-enough willingness to pay for renewable hydrogen.
- Clarifying low-carbon hydrogen’s role is key for market development and long-term climate goals.
- Scaling electrolyser deployment and continuing the rapid decarbonisation of electricity is essential for renewable hydrogen competitiveness.

Cost ranges of hydrogen by production method



Source: ACER’s monitoring report of European hydrogen markets, 19 November 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

One down-to-Earth example

- Increasing offshore wind capacity means more power generation for e.g. renewable hydrogen production
- Hydrogen infrastructure is a prerequisite to transport hydrogen on a large scale
- Hydrogen producers need sufficient certainty about offtake ahead of financial decision
- **Cross-border integration enhances the potential yet also adds to the complexity**

Source: Danish Energy Agency.

ACER
European Union Agency for the Cooperation of Energy Regulators

Complexity + uncertainty = advance with prudence

Integrated network planning

To mitigate the risks of oversizing:

- Improved demand forecasting during the planning phase is essential (incl. market tests).
- Readiness to adjust to align infrastructure with actual market needs.
- Incremental infrastructure development when uncertainty is high.
- Carefully repurposing gas networks for hydrogen to minimise costs, but without overlooking impacts on the gas sector (continuous security of supply).

Tackling demand risks in financing hydrogen infrastructure

Uncertain future hydrogen demand can lead to underutilised networks and stranded assets.

- Inter-temporal cost allocation mechanism (as e.g. in Germany) could help. Continuous monitoring is important.
- Effective risk and cost allocation between users, operators and the State is crucial.
- For cross-border hydrogen networks, timely cooperation and coordination among Member States and regulators are essential.

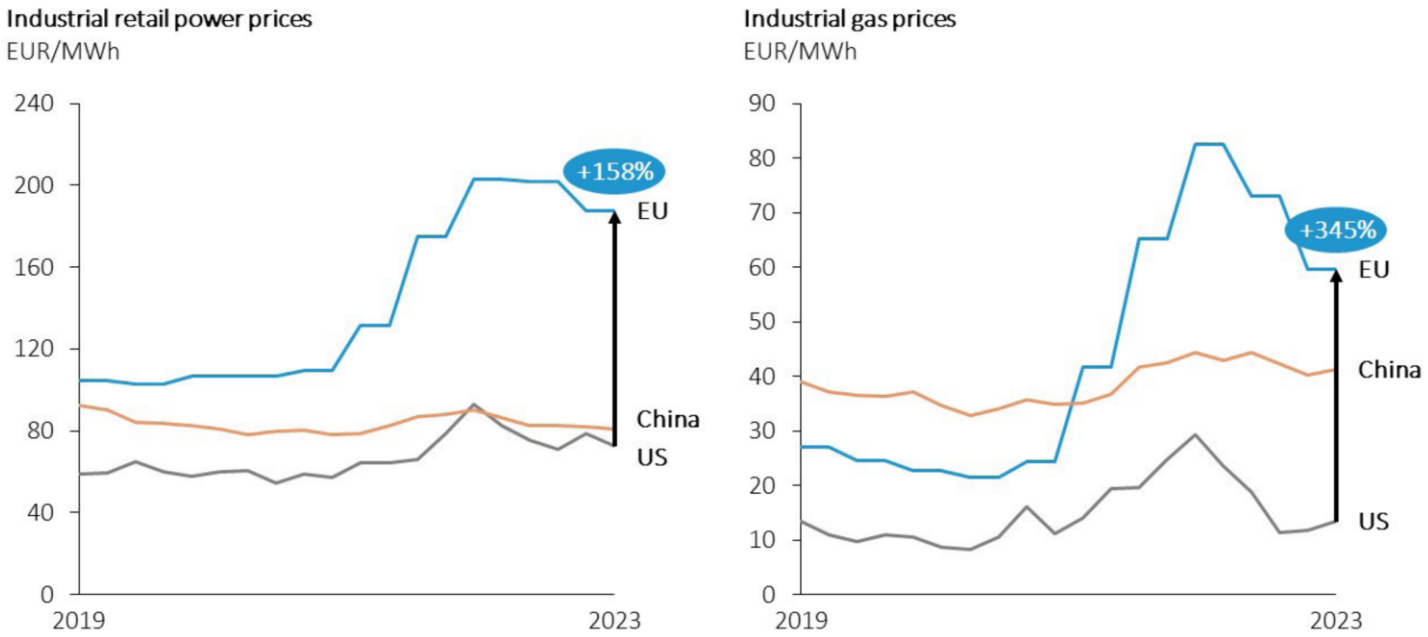
Source: ACER's Market Monitoring Report on European hydrogen markets, 19 November 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Future EU competitiveness & energy

‘The talk of the town’

Gas and retail price gap for industry



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

Source: M. Draghi, The future of European competitiveness, September 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Market integration; what might it bring …

"The more the EU advances towards a decarbonized energy system, the greater is the need for market integration. ***The benefits of integration****, in absolute terms,* ***grow with the increase of renewables in the system****, strengthening the value of its flexibility and overall resilience."*

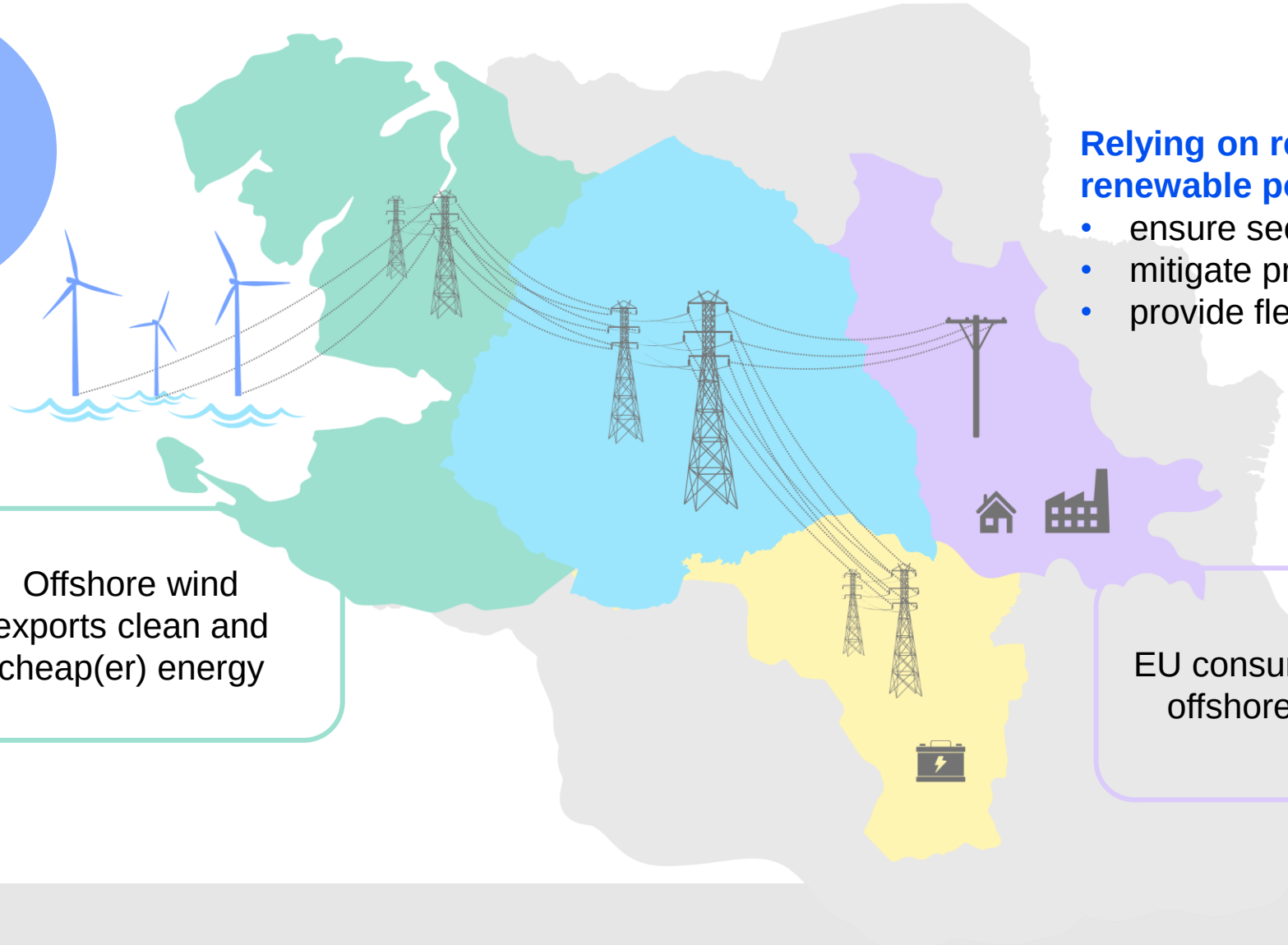
"The EU should develop the governance needed for a genuine Energy Union *so that decisions and market functions of cross-border relevance are taken centrally."*

Sources: Report submitted to the European Council by former Italian Prime Minister Enrico Letta, Much More Than a Market, April 2024.
M. Draghi, The future of European competitiveness, September 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Leveraging energy resource endowments across the EU

From 15 GW today to 300 GW by 2050



Relying on regional renewable potential to:

- ensure security of supply;
- mitigate price volatility;
- provide flexibility to the market.

Offshore wind exports clean and cheap(er) energy

EU consumers access offshore electricity

ACER
European Union Agency for the Cooperation of Energy Regulators

Key notion of ‘trust’: What might it take to get there?

1. **It starts & ends with political will**: Commitment to structurally integrate energy markets; a commitment that is anchored institutionally.
2. Coordinated infrastructure planning and cost-/benefit-sharing across borders, done or verified by public authorities.
3. Coordinated renewable and flexibility deployment across borders.
4. Closer integration of real-time operation (especially offshore).
5. Rigorous enforcement by public authorities to ensure trust in the whole framework; why else accept increased interdependence?

ACER
European Union Agency for the Cooperation of Energy Regulators

Digital, distributed & participatory = the future

ACER
European Union Agency for the Cooperation of Energy Regulators

Greater role for demand response

Barrier	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK
Lack of a proper legal framework to allow market access			N/A	Low	Low	Low				Low								Moderate			Low		Low					
Unavailability or lack of incentives to provide flexibility	Low	Low	N/A	Moderate	Moderate	Low	N/A			Low		Low	Low	Low	N/A		Low	Low		Low		Low	Moderate		N/A	N/A		Moderate
Restrictive requirements to providing balancing services			N/A	NAP					Low				Moderate		N/A	Low				NAP			Low	Low				
Restrictive requirements to providing congestion management	High		N/A	N/A	High	Moderate	High	NAP				Low			High		NAP	NAP	High	Moderate	Moderate		Moderate		Low		High	High
Restrictive requirements to participating in capacity mechanisms	NAP	Low	NAP	NAP	NAP	Moderate	NAP	NAP	NAP	Low		NAP	NAP	NAP	Low		NAP	NAP	NAP	NAP	NAP	NAP	Low	NAP	NAP		NAP	NAP
Restrictive requirements to participating in interruptibility schemes	NAP	NAP	NAP	NAP	NAP	Moderate	NAP	NAP	NAP	NAP	Moderate	NAP	NAP	NAP	NAP		NAP	NAP	NAP	NAP	NAP	NAP	Low	NAP	NAP	NAP	NAP	NAP
Limited competitive pressure in the retail market			Low	Moderate		N/A	N/A				Low	Moderate	Moderate	Moderate	Low		Low	Low		High	Low		Low	Moderate				Low
Retail price interventions		N/A	Low	High			NAP	NAP		NAP	Low	High	N/A	Moderate	NAP		Low	N/A	NAP	High	High		High	N/A	NAP	NAP	NAP	High

High Moderate Low Not (too) restrictive N/A NAP

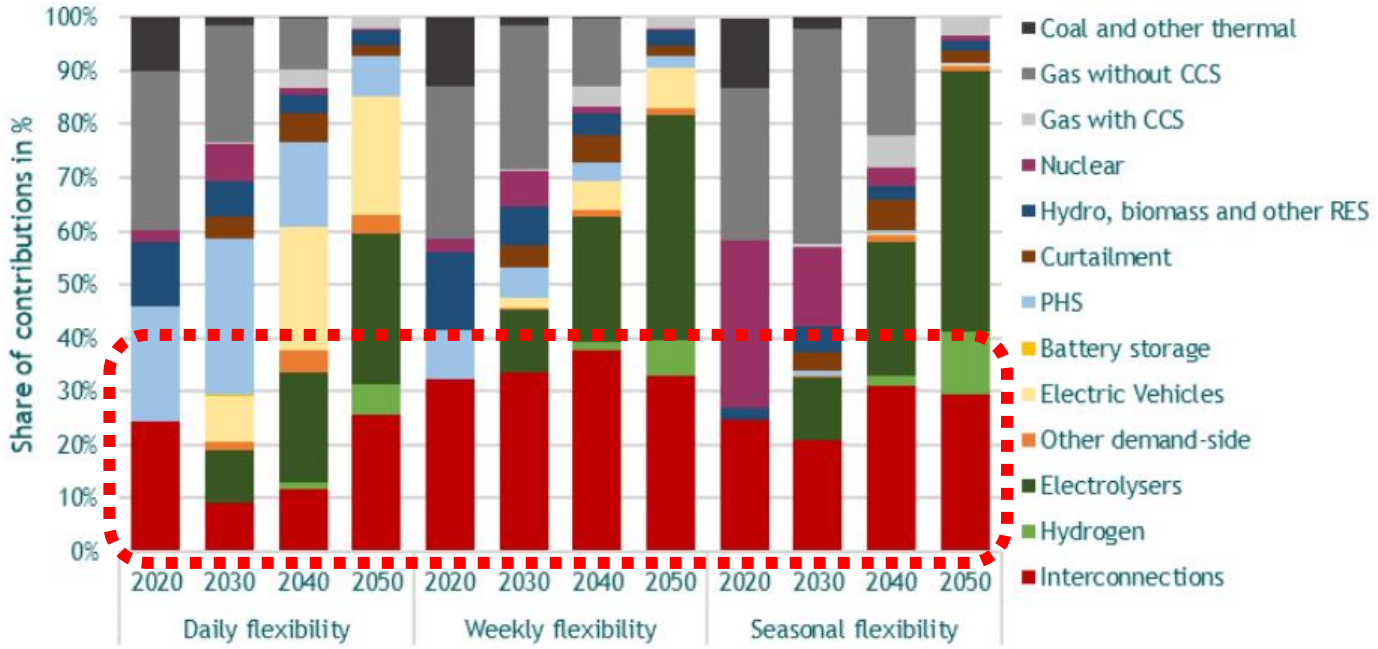
Barriers to demand response are often **'hiding in plain sight'**.
The sum of many small obstacles can add up to significant barriers, impeding system flexibility.
A detailed and updated ACER report on the first three barriers listed above will be released in early 2025.

Source: ACER report: Demand response and other distributed energy resources: what barriers are holding them back?, December 2023.

ACER
European Union Agency for the Cooperation of Energy Regulators

Future flexibility needs also point to interconnectors

Share of technologies providing system flexibility in the Pentalateral countries for daily, weekly and seasonal timeframes



As coal and conventional gas plants increasingly are phased out, flexibility portfolios will transform, gradually relying more on cross-border exchanges, storage, demand-side response and low-carbon technologies. Interconnections can play a key role, not least in multi-day/multi-week flexibility time frames.

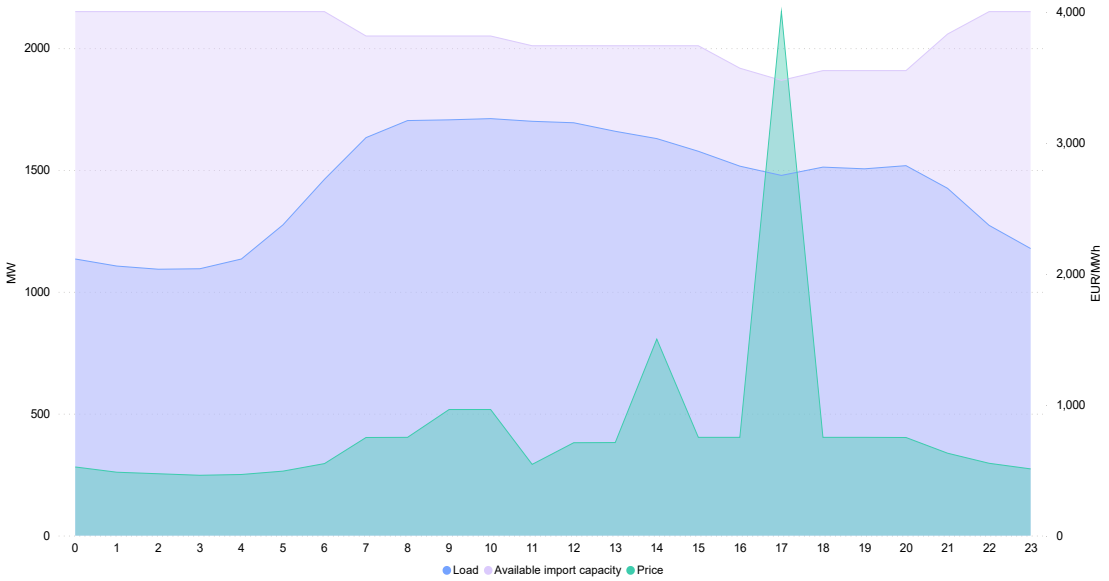
Source: Trinomics & Artelys study for the Pentalateral Energy Forum: Power System Flexibility in the Penta region – Current State and Challenges for a Future Decarbonised Energy System, March 2023.

ACER
European Union Agency for the Cooperation of Energy Regulators

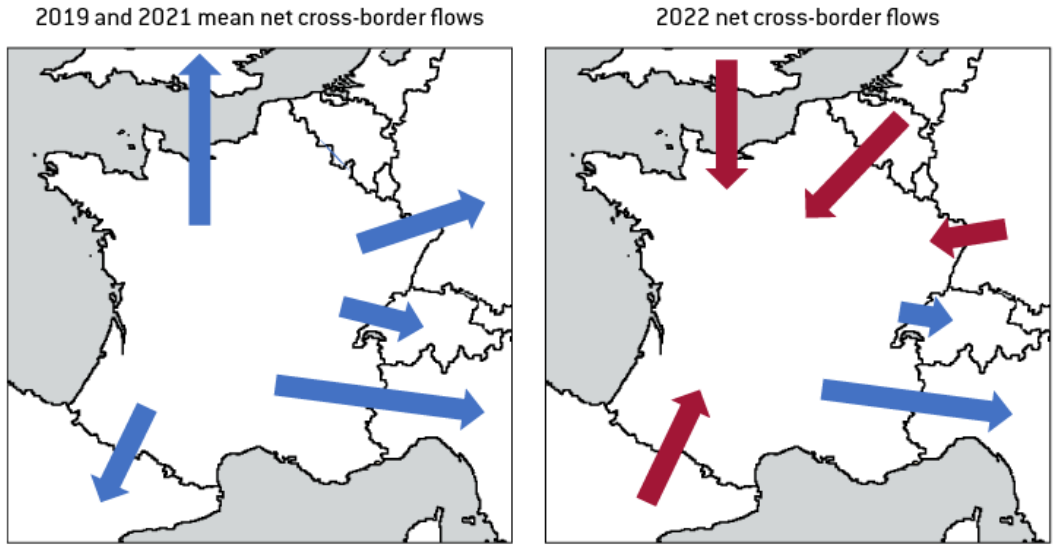
Beyond flexibility, providing also security of supply

Small reductions in cross-zonal capacity triggered price spikes in the Baltic region, 17 August 2022

Hourly variations in load, import capacity and day-ahead price in the Baltic region on 17 August 2022 (MW, MW and EUR/MWh, respectively)



France became a huge importer of electricity during the energy crisis



Note: The length of the arrow is directly proportional to the amount of electricity imported or exported.

Well-interconnected markets are key to mitigate the impact of national price shocks and enable Member States under strain to import surplus electricity from abroad or export excess generation.

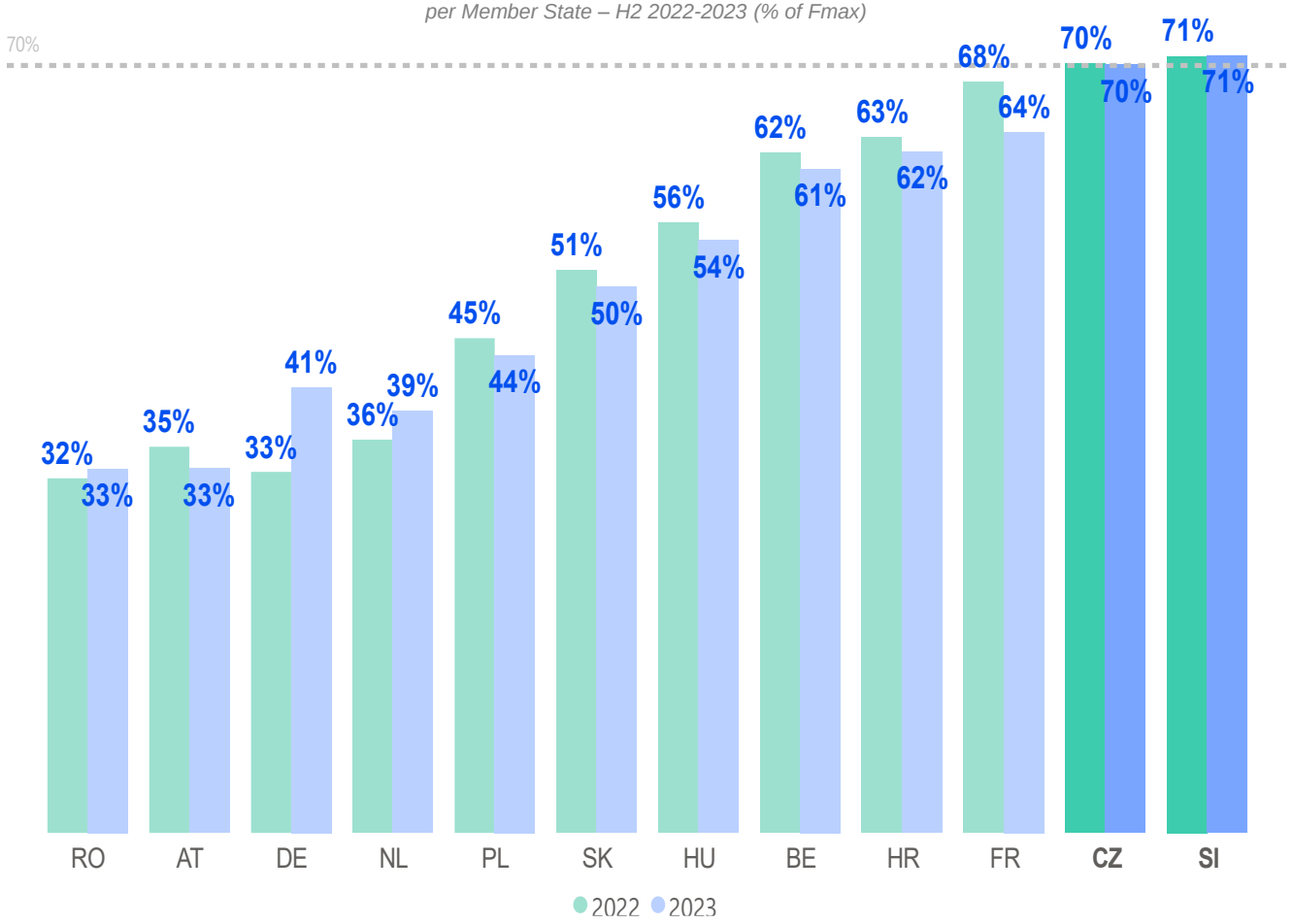
Sources: Left: Zachmann, G., C. Batlle, F. Beaude, C. Maurer, M. Morawiecka and F. Roques (2024) 'Unity in power, power in unity: why the EU needs more integrated electricity markets', Policy Brief 2024/03, Bruegel. Right: Bruegel based on ENTSO-E's Transparency Platform. Text: ACER-CEER strategic paper on electricity market design, July 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

However, improvements are needed …

There is limited progress towards 70%

Average minimum hourly margin available for cross-zonal trade in the Core capacity calculation region per Member State – H2 2022-2023 (% of Fmax)



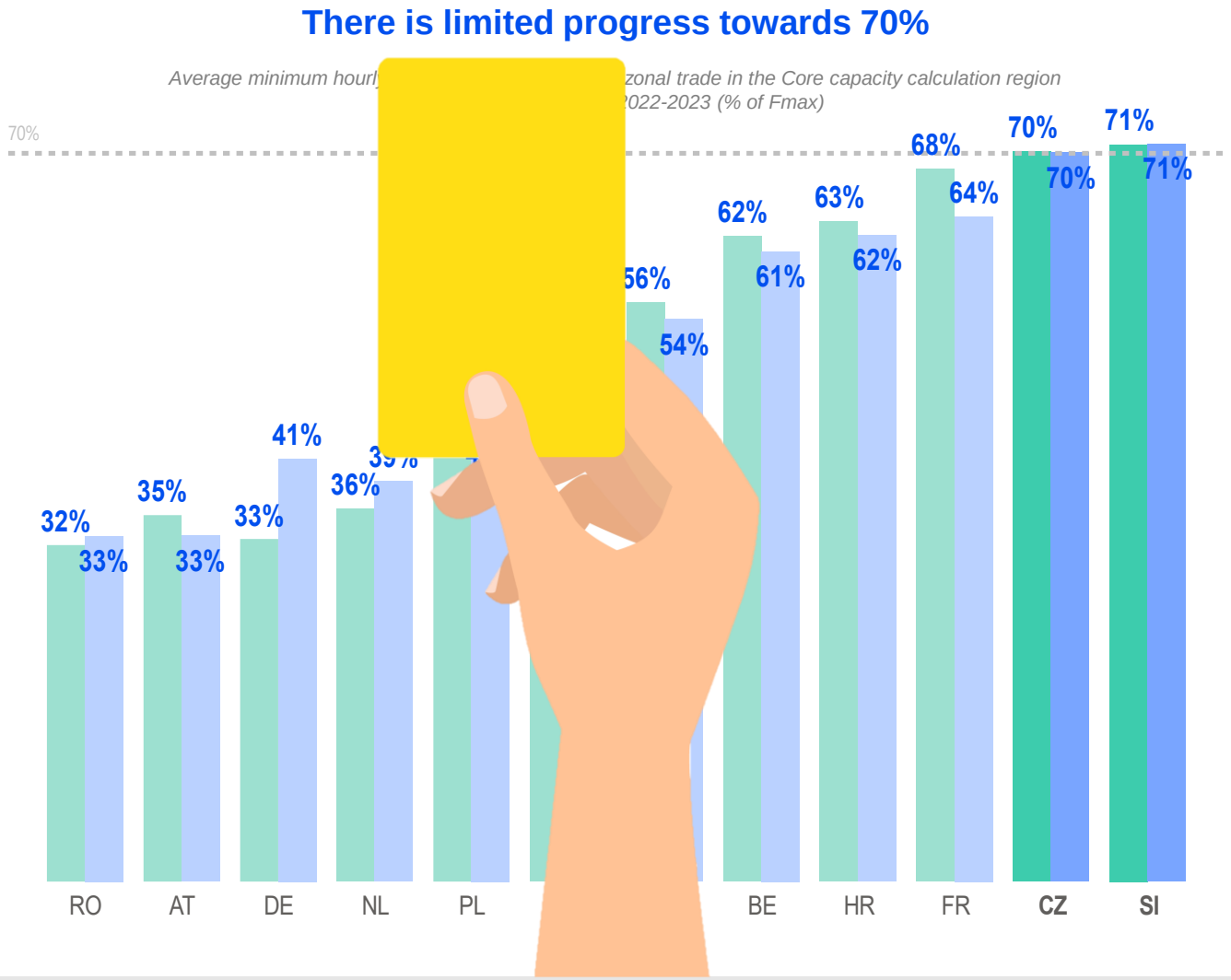
Increasing cross-border capacity is needed to unlock benefits, including more flexibility. Necessary steps are:

- TSOs to make **optimal and coordinated use of remedies to relieve congestions** in the grid.
- TSOs to undertake **targeted grid developments.**
- TSOs to complete the **bidding-zone review** process and Member States/ European Commission to decide.

Source: ACER's report on capacities for cross-zonal trade of electricity and congestion management, July 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

However, improvements are needed …



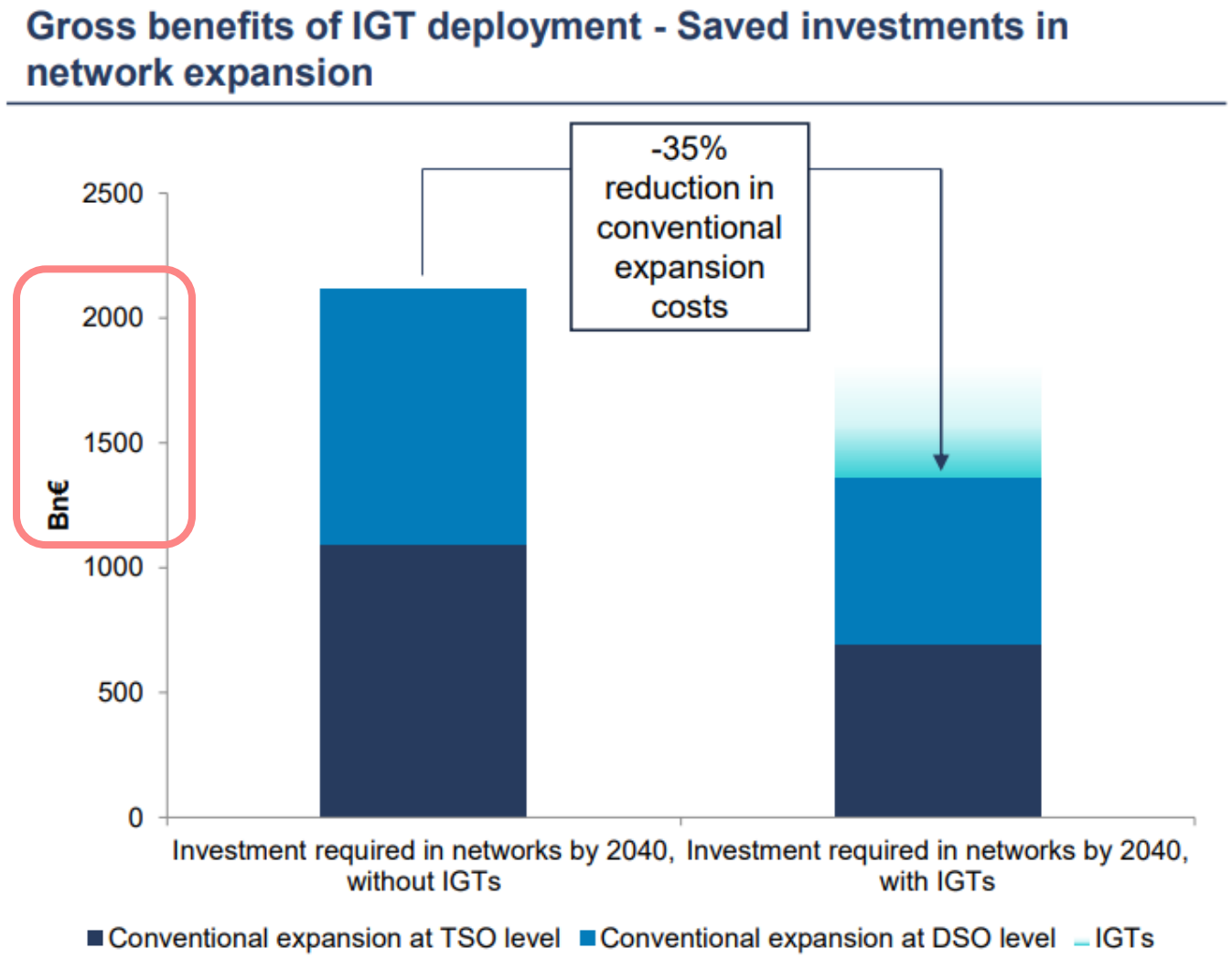
Increasing cross-border capacity is needed to unlock benefits, including more flexibility. Necessary steps are:

- TSOs to make **optimal and coordinated use of remedies to relieve congestions** in the grid.
- TSOs to undertake **targeted grid developments.**
- TSOs to complete the **bidding-zone review** process and Member States/ European Commission to decide.

Source: ACER's report on capacities for cross-zonal trade of electricity and congestion management, July 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

Finally, grid buildout calls for grid capacity increase



Innovative grid technologies can help:

- 20-40 % increase in overall network capacity by 2040
- 35 % reduction in conventional expansion costs by 2040

Source: CurrENT and Compass Lexecon: Prospects for Innovative Power Grid Technologies, June 2024.

ACER
European Union Agency for the Cooperation of Energy Regulators

ACER planning, priorities & needs up ahead

ACER
European Union Agency for the Cooperation of Energy Regulators

Single Programming Document 2025-2027

Drivers

- Energy systems undergoing **massive changes**
- Changes in the **regulatory landscape**
- Unprecedented **high energy prices**

Tasks

- Network Codes; Guidelines
- REMIT
- TEN-E
- Security of supply
- Clean Energy for All Europeans laws
- Decarbonisation and the EU Green Deal

Strategic goals

01 Facilitate the integration of Europe's energy markets and monitor their functioning

02 Tackle challenges in infrastructure, flexibility needs and security of supply

03 Enhance the integrity and transparency of wholesale energy markets

04 Contribute to addressing longer-term regulatory challenges

05 Ensure the resilience, efficiency, and agility of the Agency

ACER
European Union Agency for the Cooperation of Energy Regulators

ACER tasks per recent EU legislative reforms

Electricity Market Design

- Flexibility needs
  - Approval of the methodology
  - EU assessment
  - Reporting on barriers to flexibility
- PPAs (data collection, reporting)
- Streamlining the framework for capacity mechanisms (EU assessment)
- Report on best practices for network tariffs

REMIT II

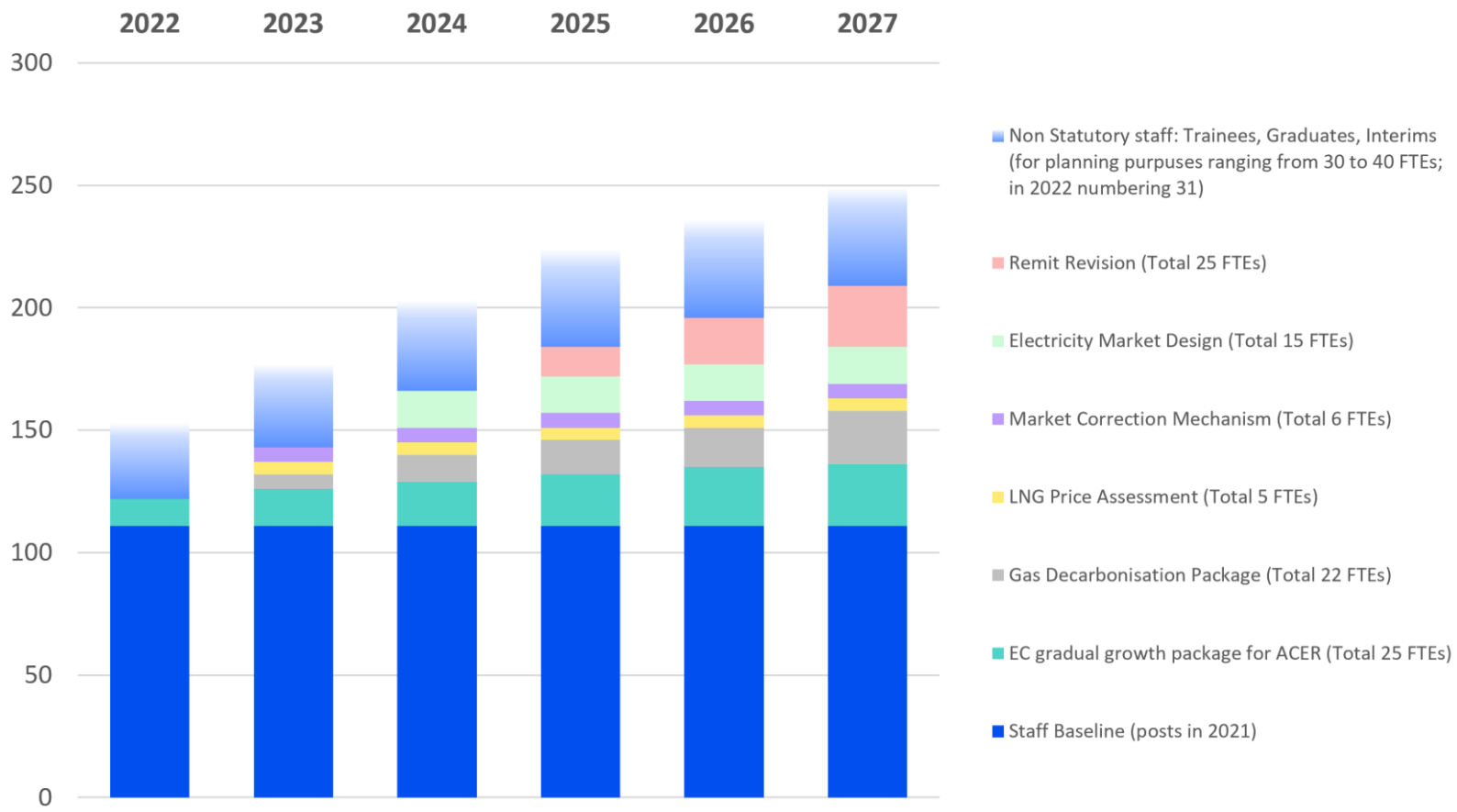
- Investigating breaches of the REMIT prohibitions/obligations
- Scope of products extended to wholesale energy financial derivatives
- Issuing guidelines to market participants
- Authorisation and supervision RRMs & IIPs
- Continuing LNG benchmark

Hydrogen and Decarbonised Gas Market Package

- Opinions on hydrogen infrastructure and network planning
- Reports on the impact of unbundling rules on the hydrogen market, and hydrogen market functioning
- Monitoring of hydrogen markets
- Guidelines and other deliverables related to Network Codes
- Opinions on exemptions for hydrogen, harmonisation of published information, methodologies for setting hydrogen network access tariffs or reserve prices

ACER
European Union Agency for the Cooperation of Energy Regulators

Implications for staff growth & future premises



Source: ACER staff evolution over the period 2022-2027.

Thank you for the opportunity. Looking forward to the discussion.

ACER

European Union Agency for the Cooperation of Energy Regulators

info@acer.europa.eu
acer.europa.eu
@eu_acer
linkedin.com/company/eu-acer


ACER
European Union Agency for the Cooperation
of Energy Regulators
ACER is hiring!
Join us in powering Europe's energy future.
Check out our job vacancies (in many areas).

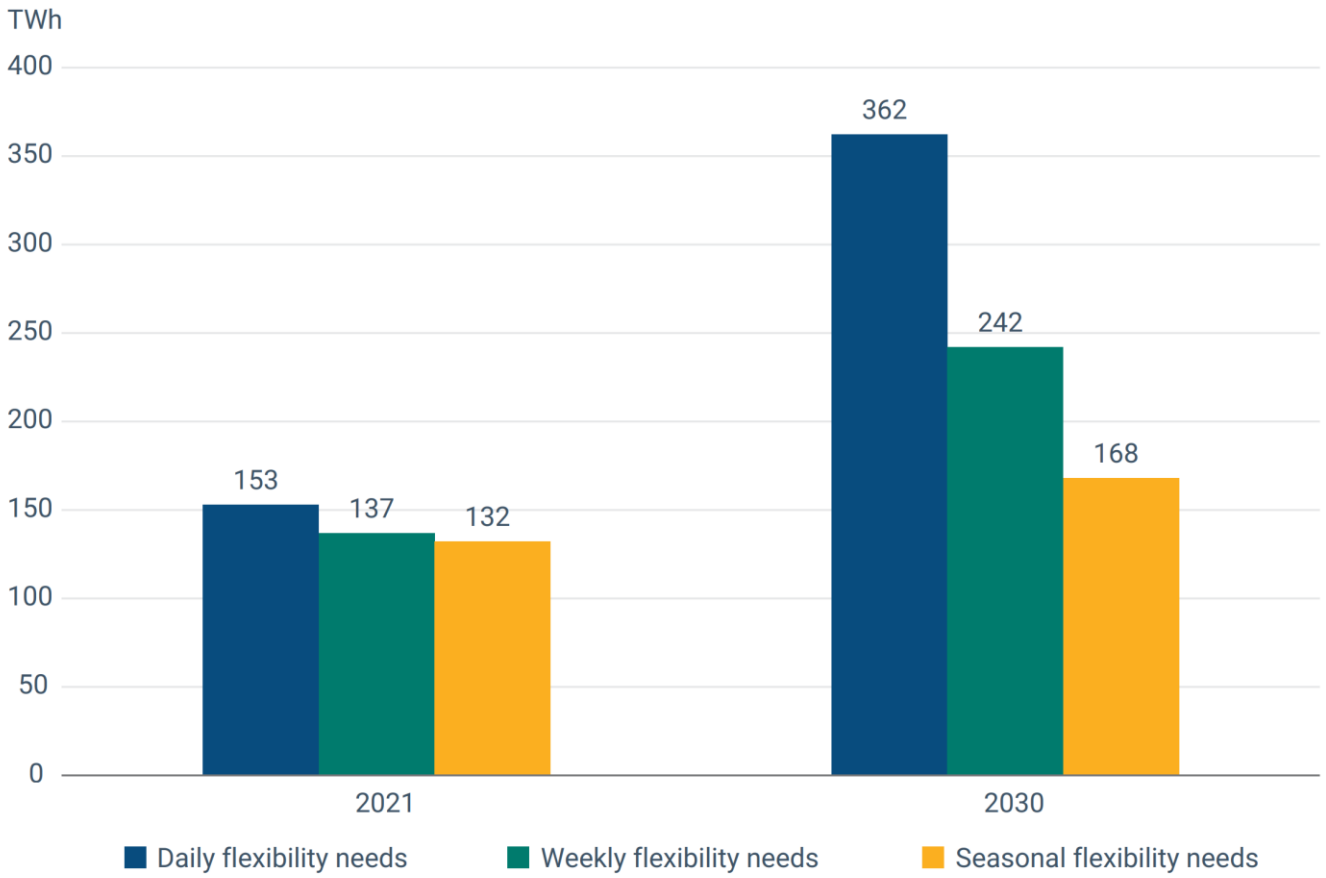
ACER
European Union Agency for the Cooperation of Energy Regulators

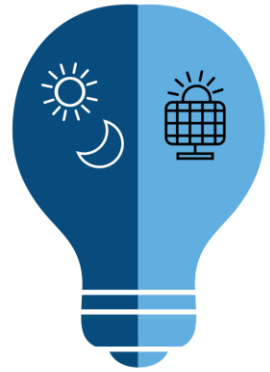
ACER role and governance

- **Supporting the integration of energy markets in the EU** (by common rules at EU level). Primarily directed towards transmission system operators and power exchanges.
- **Contributing to efficient trans-European energy infrastructure**, ensuring alignment with EU priorities.
- Monitoring energy markets to ensure that they function well, **deterring market manipulation and abusive behaviour**.
- Where necessary, **coordinating cross-national regulatory action**.
- Governance: **Regulatory oversight is shared** with national regulators. **Decision-making** within ACER is collaborative and joint (formal decisions requiring 2/3 majority of national regulators). **Decentralised enforcement** at national level.
- Headquartered in Ljubljana, Slovenia. **Engaged across the EU**.

ACER
European Union Agency for the Cooperation of Energy Regulators

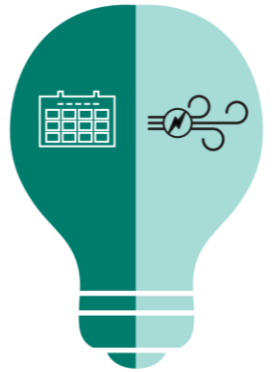
Flexibility needs double by 2030





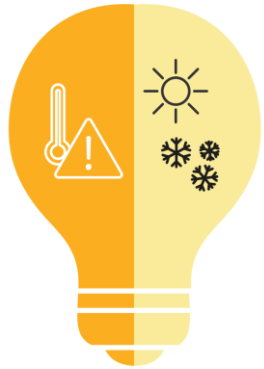
Daily flexibility

Morning and evening demand peaks
Day-night generation difference



Weekly flexibility

Weekday-weekend demand difference
Wind pattern fluctuations



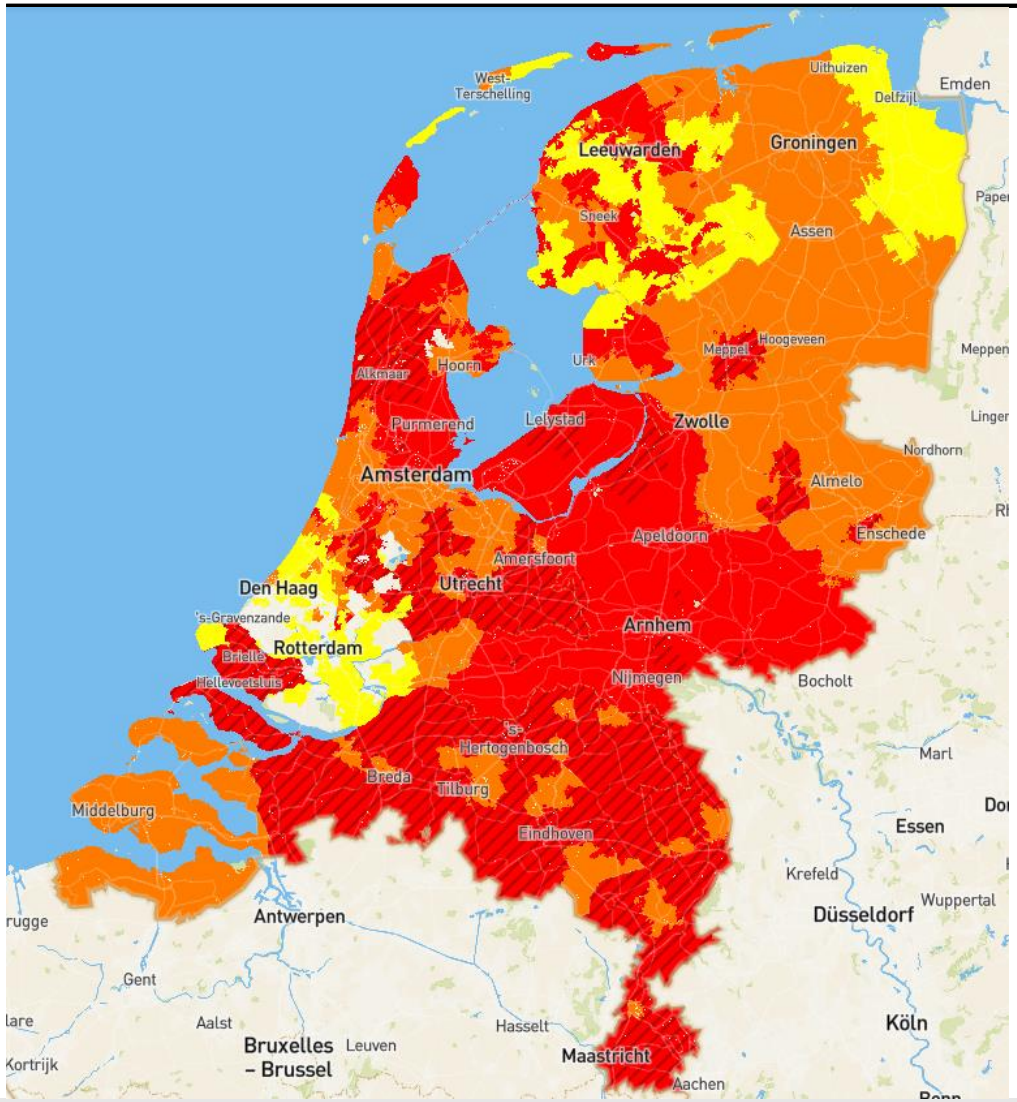
Seasonal flexibility

Heating-cooling periods
Seasonal weather patterns

Source: ACER-EEA report: Flexibility solutions to support a decarbonised and secure EU electricity system, October 2023.

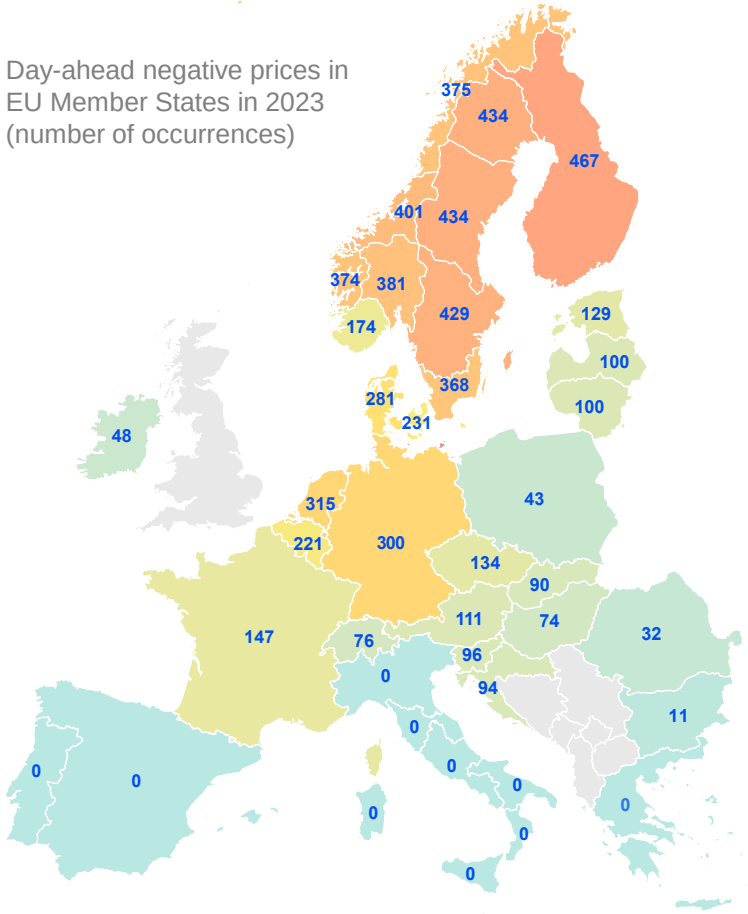
ACER
European Union Agency for the Cooperation of Energy Regulators

Multiple signals of insufficient flexibility

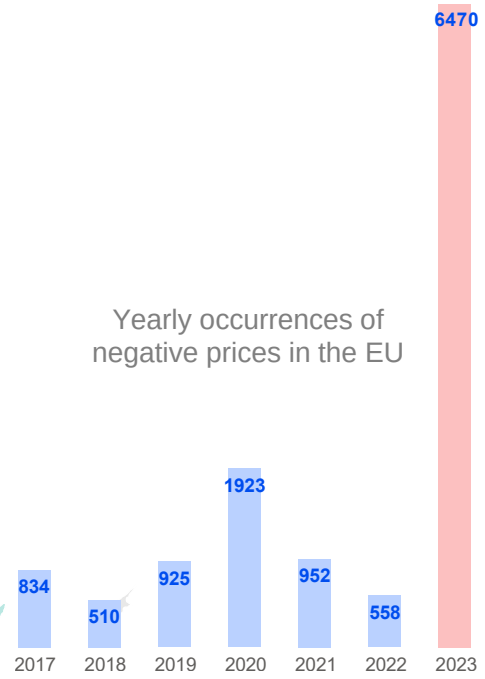


Unprecedented record of negative prices

Day-ahead negative prices in EU Member States in 2023 (number of occurrences)



Yearly occurrences of negative prices in the EU



Source: https://capaciteitskaart.netbeheernederland.nl/, April 2024.

Source: ACER's report on key developments in the electricity market, March 2024.