Council of the European Union
General Secretariat

Brussels, 19 March 2025

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MEETING DOCUMENT

From:	General Secretariat of the Council
To:	Working Party on Energy
Subject:	Key developments in EU electricity and gas markets - presentation by ACER

Delegations will find in the annex the presentation by ACER on the Key developments in EU electricity and gas markets.

Key developments in EU electricity and gas markets

Selected results from the 2025 Market Monitoring Report

Presentation to the EWP, 19 March 2025

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Key observations

Gas prices are shaped by global competition, and, in turn, shape electricity prices.

Renewable energy sources mitigate this influence in short-term markets.

Combined with demand-side response, battery storage and cross-zonal trading, renewables will help stabilise prices.

Gas will remain central for seasonal flexibility.

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Global context

- A brief competitiveness overview
- How gas imports and renewables shape EU energy trade

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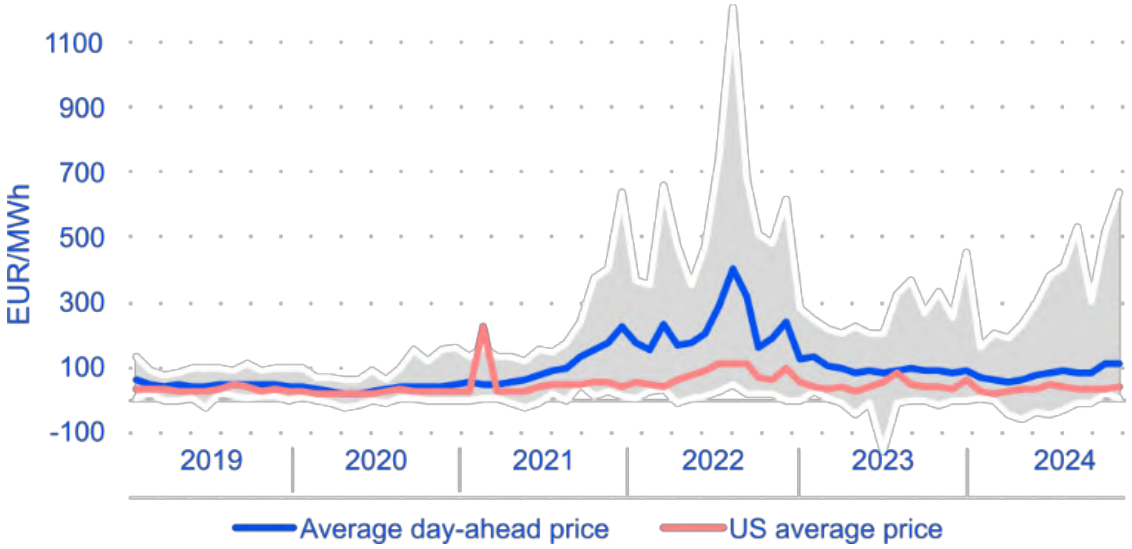
Reducing EU's need for energy imports will cut costs

Energy in the EU remained more expensive than that of US.

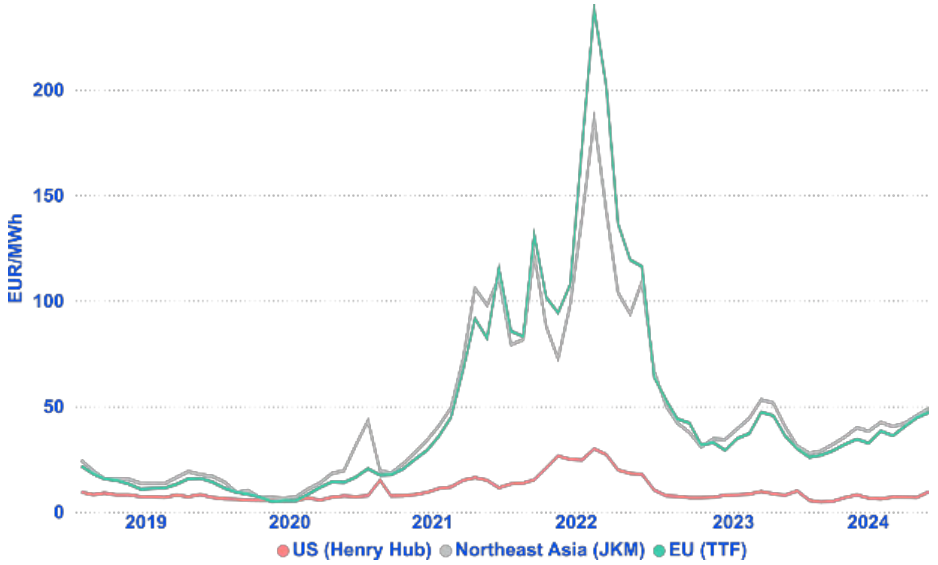
In 2024, average wholesale electricity price was twice that of the U.S. (46 EUR/MWh) …

Average of the minimum, average and maximum day-ahead electricity prices per month and Member State, 2019-2024 (EUR/MWh)



… while average wholesale gas price was five times higher (27 EUR/MWh).

Average prices of key international gas benchmarks, 2019-2024 (EUR/MWh)



Source: ENTSO-E Transparency Platform, EIA, Eurostat.

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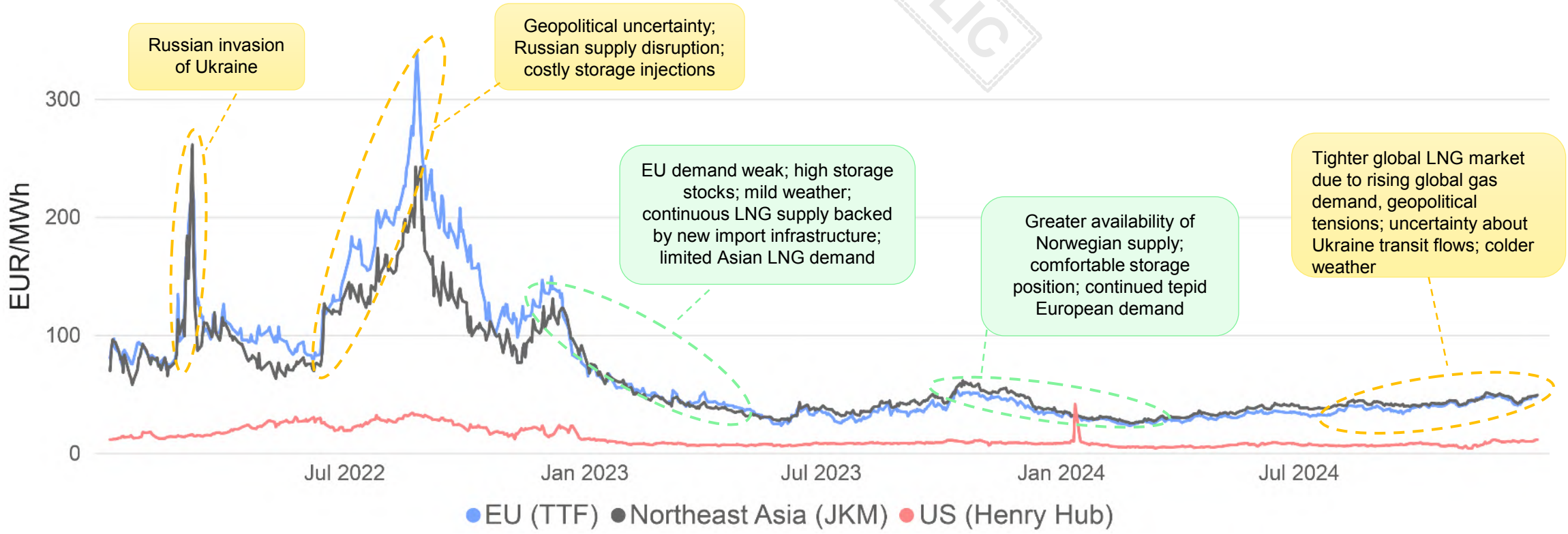
Gas markets are evolving & increasingly global

Price evolution of global gas benchmarks, 2021 - 2024 (EUR/MWh)

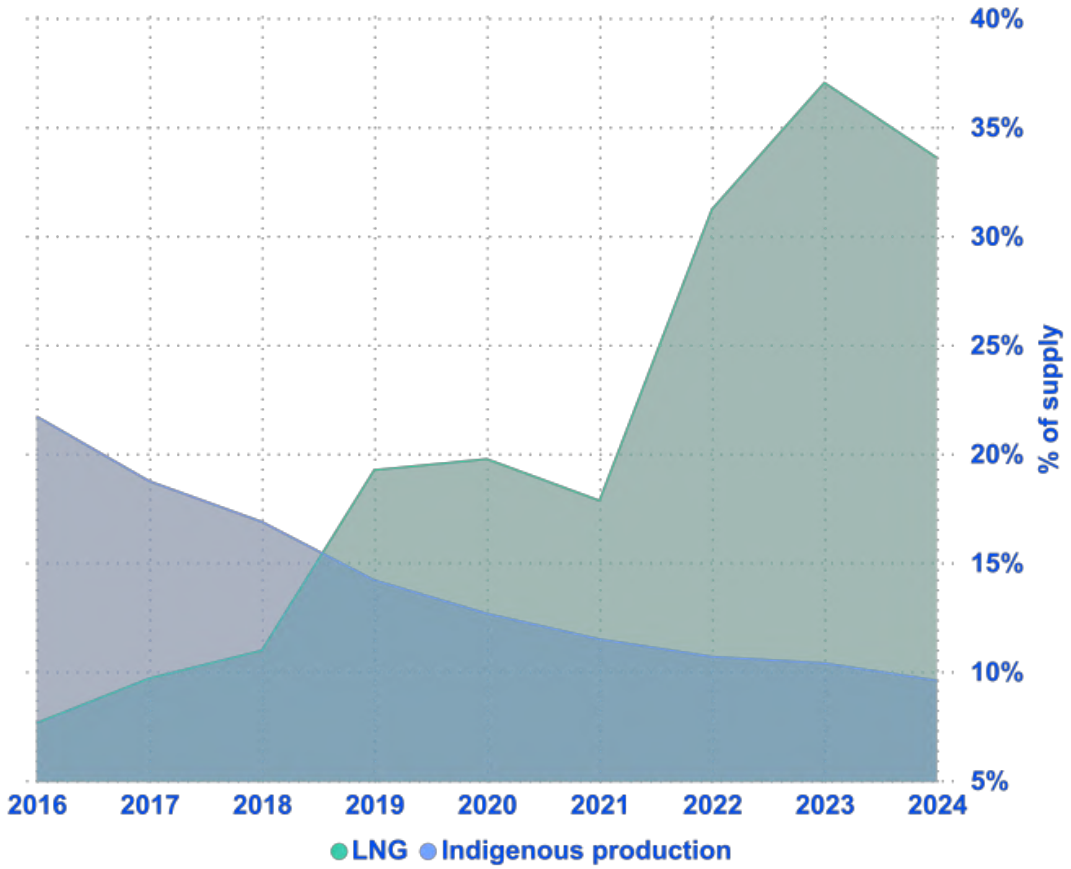


Source: ACER based on ICIS Heren.
Note: The Dutch Title Transfer Facility gas hub (TTF) and the United States Henry Hub are used as benchmarks for European and American gas prices respectively.

Global LNG market set to move from tight to well supplied

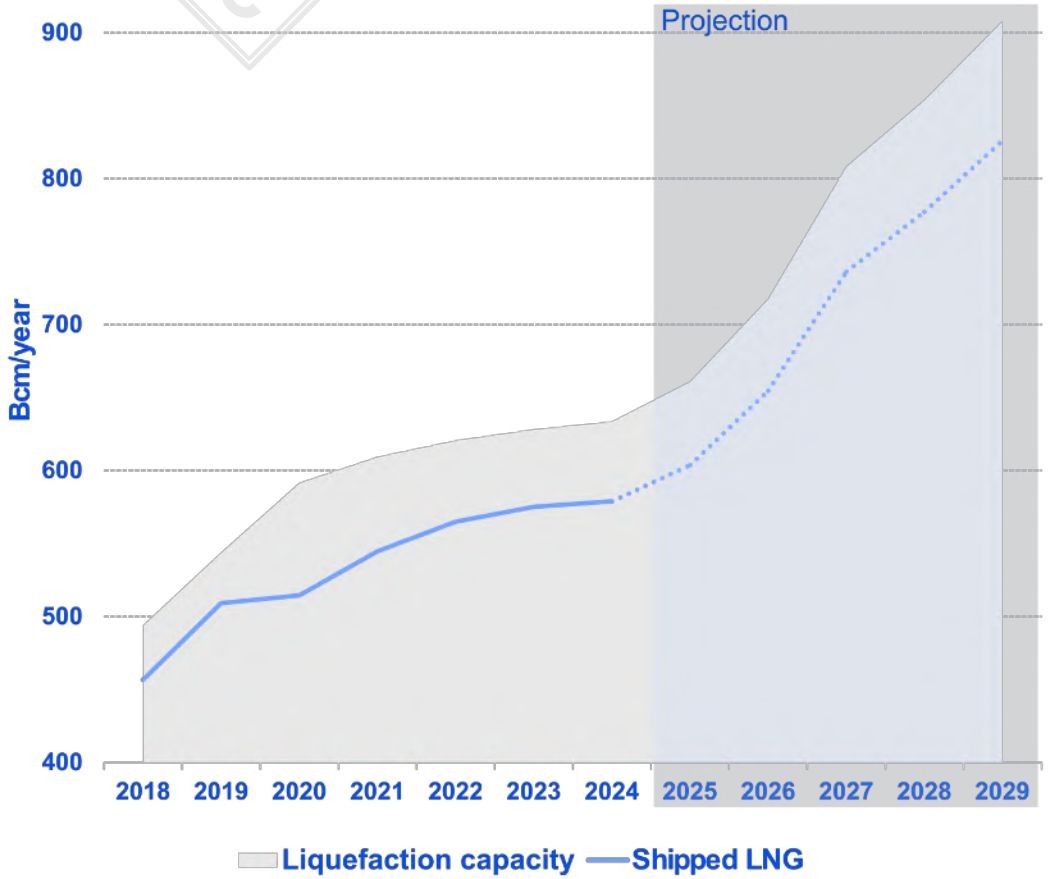
Exposure to global LNG dynamics is the new reality for EU gas markets…

Share of LNG and indigenous production in total supply, EU-27, 2016-2024 (%)



…but a significant expansion in LNG production is expected to loosen markets in the coming years

Global liquefaction capacity and LNG production, 2018 – 2029 (Bcm)



Source: ACER based on S&P Global.

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Europe

- EU energy prices volatility
- How gas reliance influences electricity prices
- Renewables cut gas role in electricity generation but dependence remains

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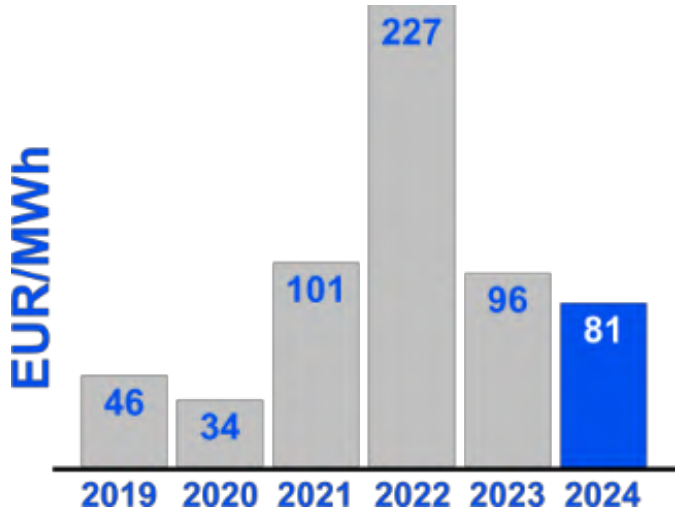
Starting with the good news

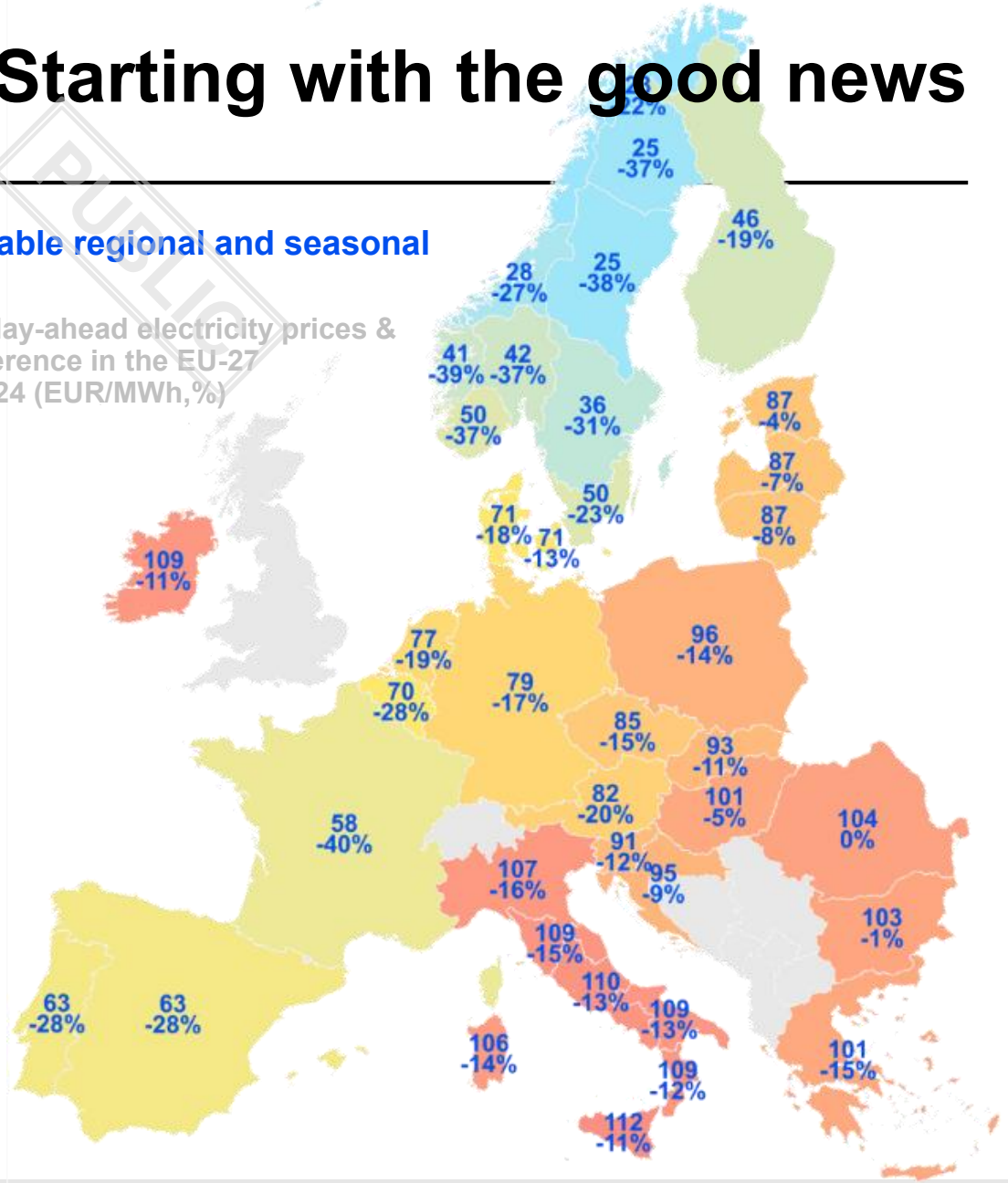
Energy prices at their lowest since 2021…

Average annual day-ahead electricity prices, EU-27 /EEA(Norway), 2019-2024 (EUR/MWh)



… but with notable regional and seasonal variations

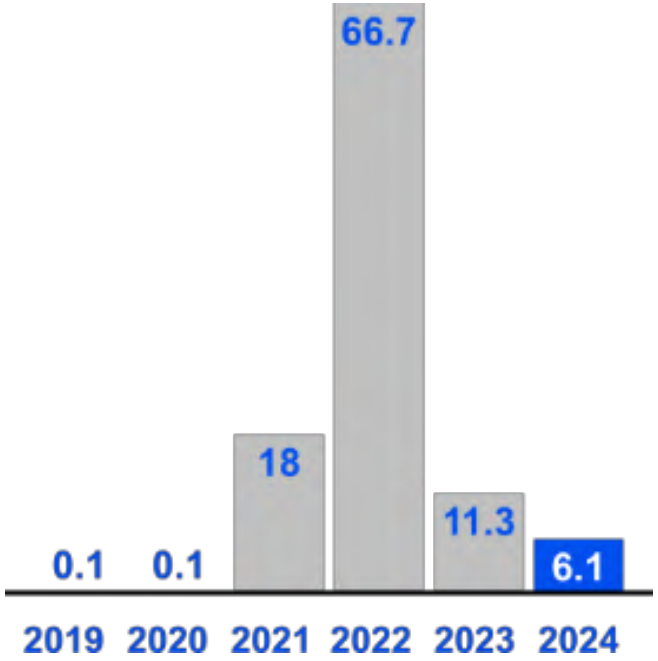
Average annual day-ahead electricity prices & year-on-year difference in the EU-27 /EEA(Norway),2024 (EUR/MWh,%)



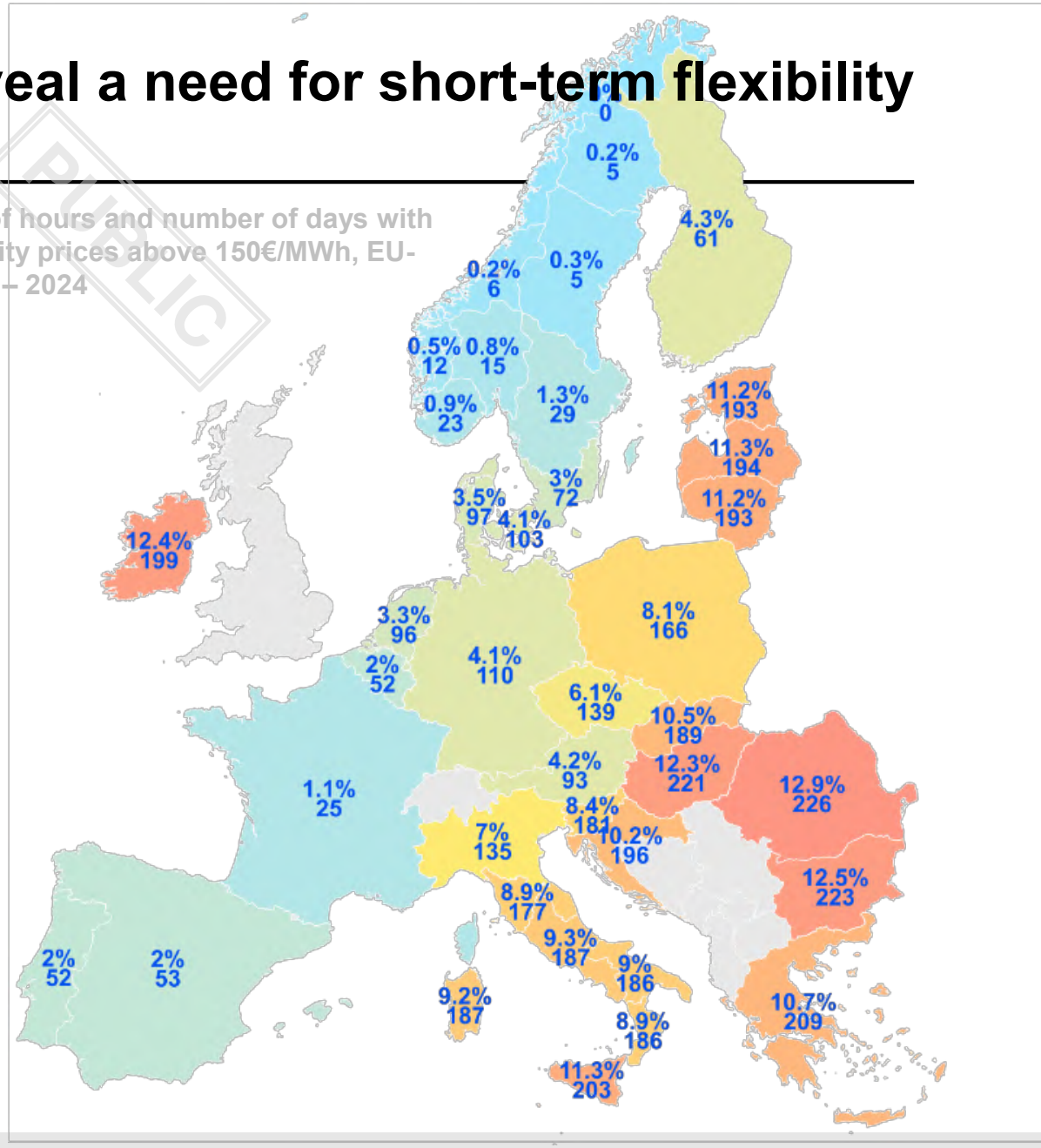
Electricity prices reveal a need for short-term flexibility

Fewer extreme prices after the crisis…

Annual Percentage of the time when electricity prices were above 150 EUR/MWh, EU-27/EEA(Norway) – 2019-2024 (%)



Share of hours and number of days with electricity prices above 150€/MWh, EU-27/EEA – 2024



Source: ENTSO-E Transparency Platform.

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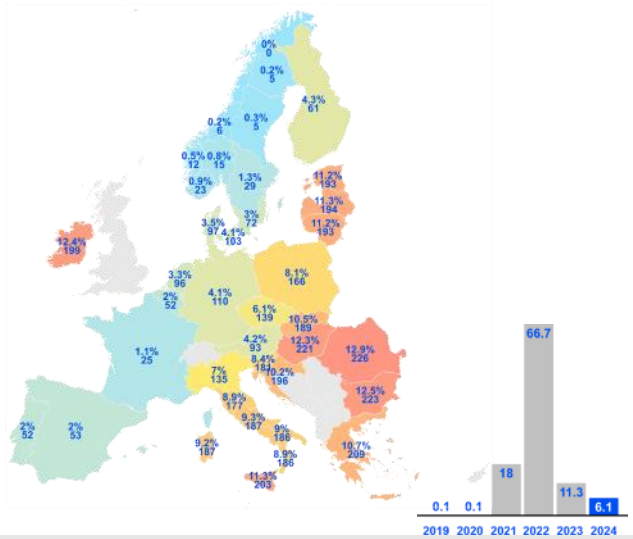
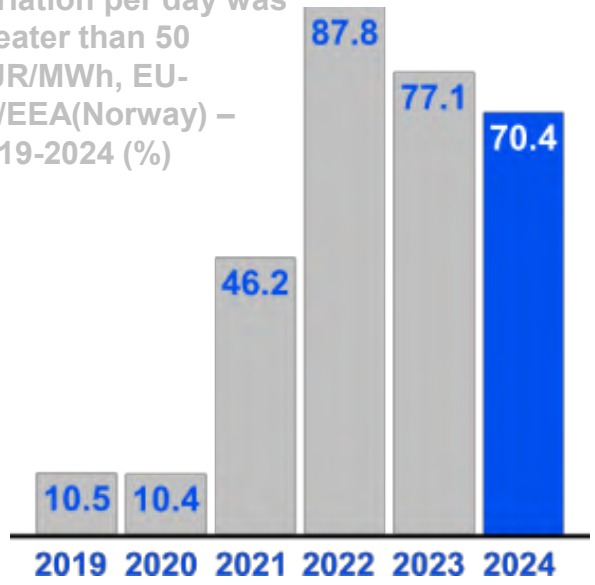
Electricity prices reveal a need for short-term flexibility

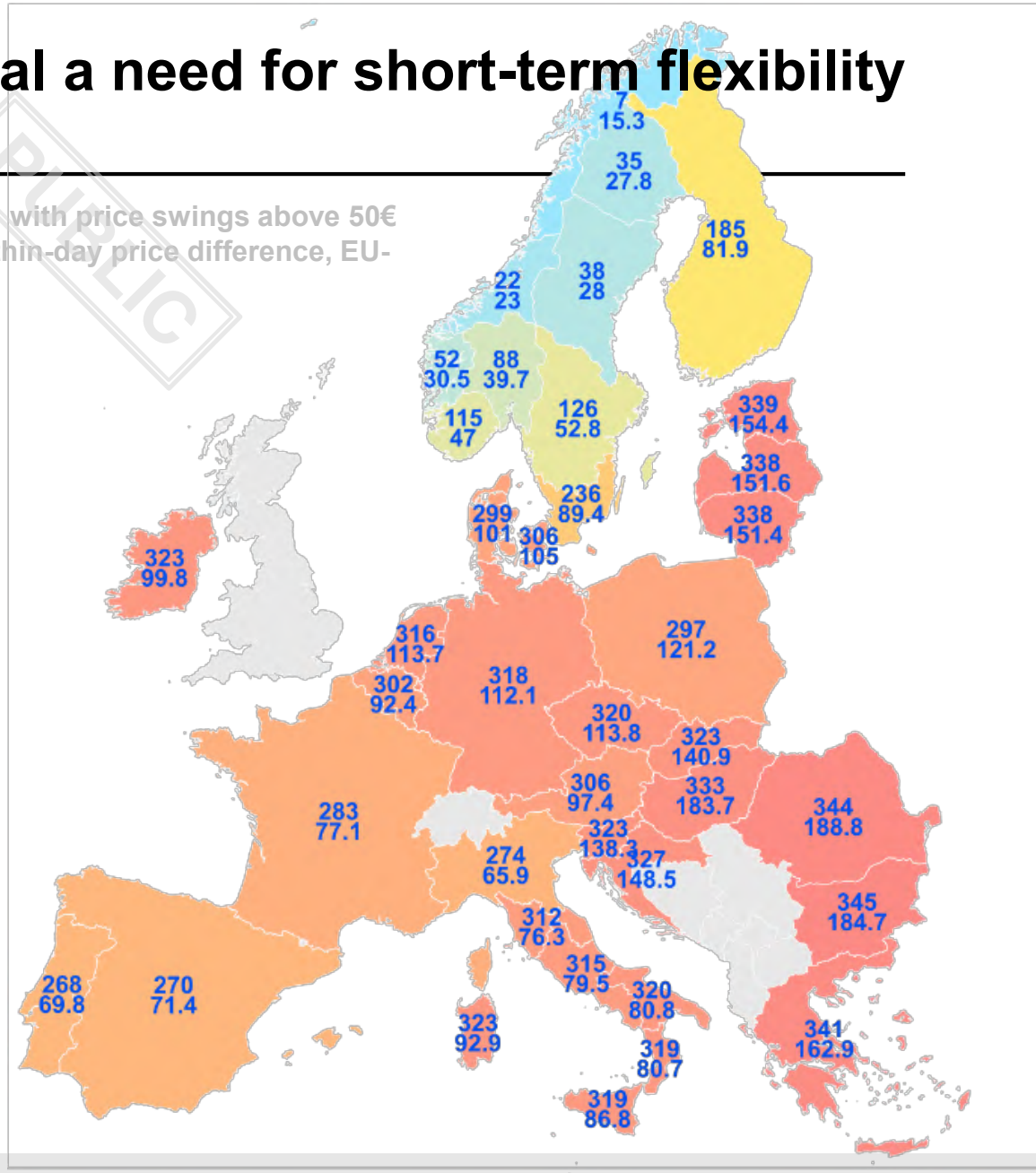
…but strong price swings persist



Annual percentage of days when price variation per day was greater than 50 EUR/MWh, EU-27/EEA(Norway) – 2019-2024 (%)



Number of days with price swings above 50€ and average within-day price difference, EU-27/EEA – 2024



Source: ENTSO-E Transparency Platform.

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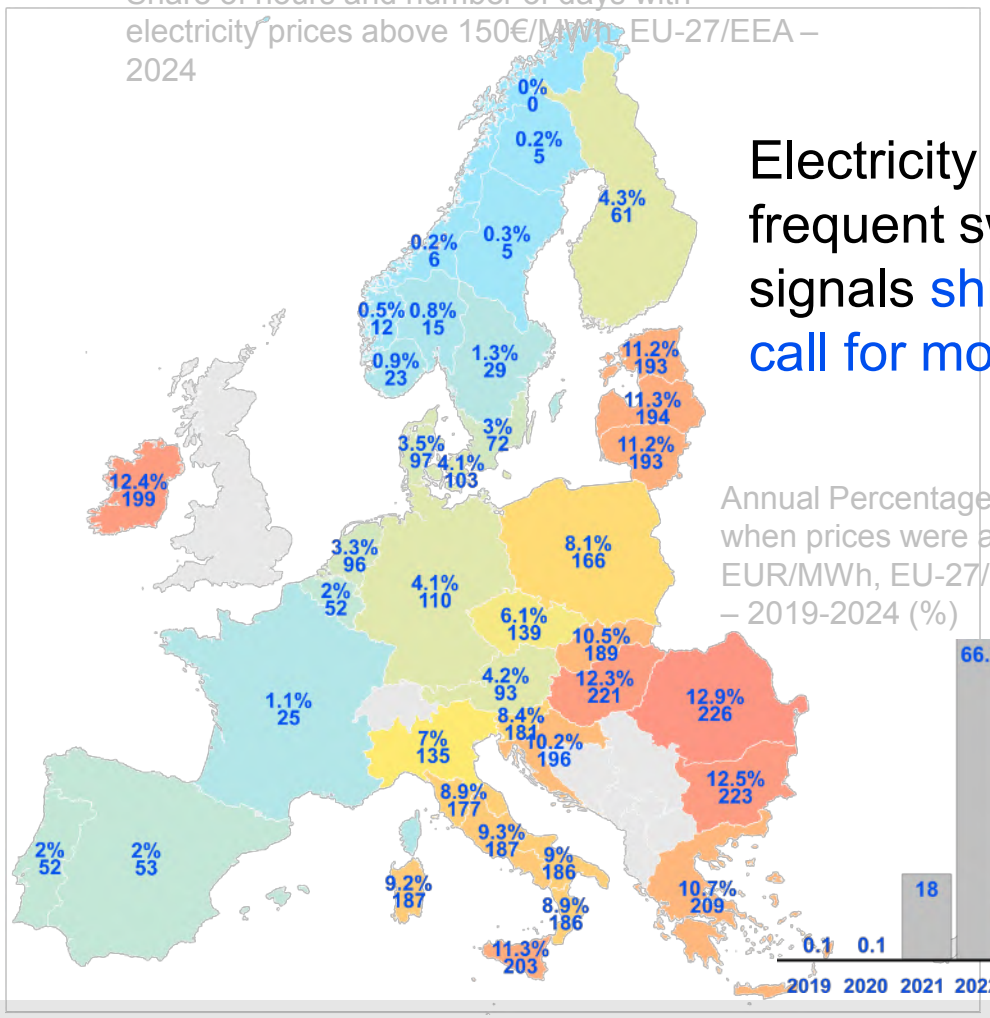
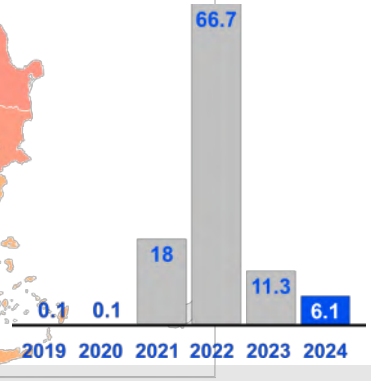
Electricity prices reveal a need for short-term flexibility

Fewer extreme price spikes after the crisis…

Share of hours and number of days with electricity prices above 150€/MWh, EU-27/EEA – 2024

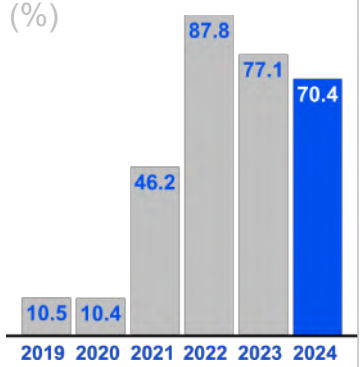


Annual Percentage of the time when prices were above 150 EUR/MWh, EU-27/EEA(Norway) – 2019-2024 (%)



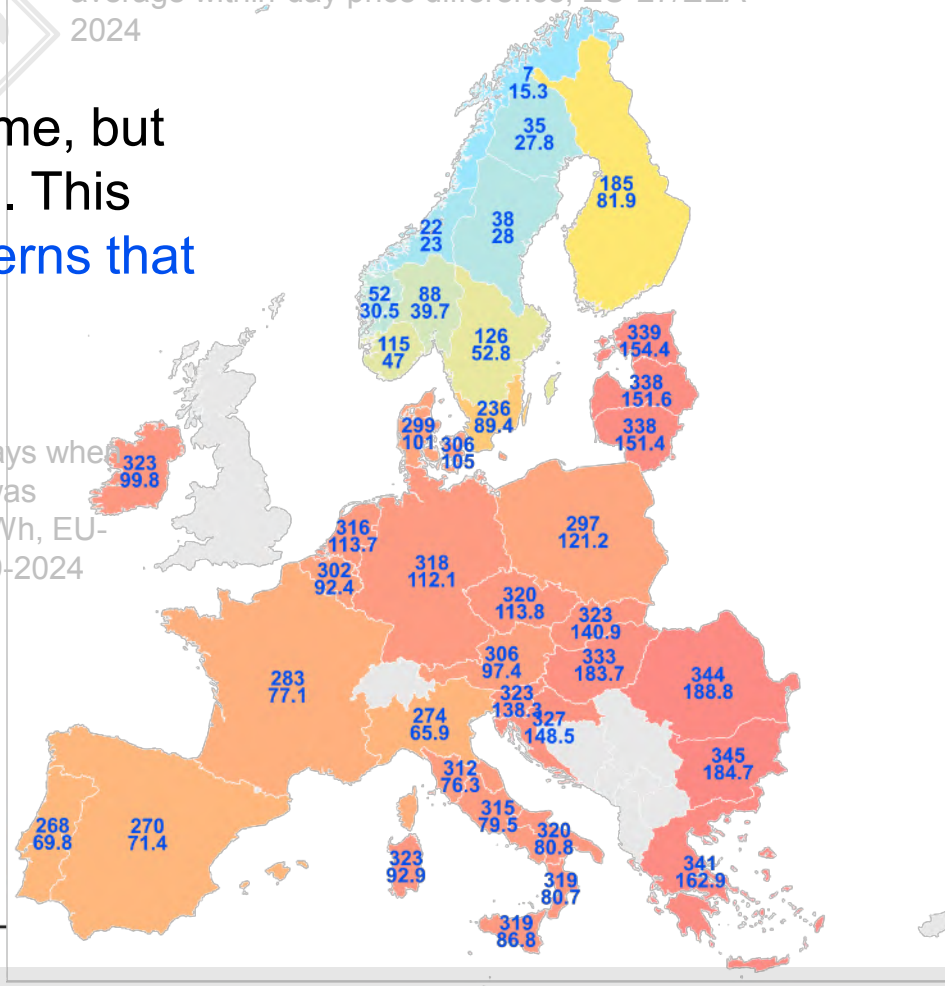
Electricity prices are now less extreme, but frequent swings within a day remain. This signals shifting supply-demand patterns that call for more short-term flexibility.

Annual percentage of days when price variation per day was greater than 50 EUR/MWh, EU-27/EEA(Norway) – 2019-2024 (%)



…but strong price swings persist

Number of days with price swings above 50€ and average within-day price difference, EU-27/EEA – 2024



Source: ENTSO-E Transparency Platform.

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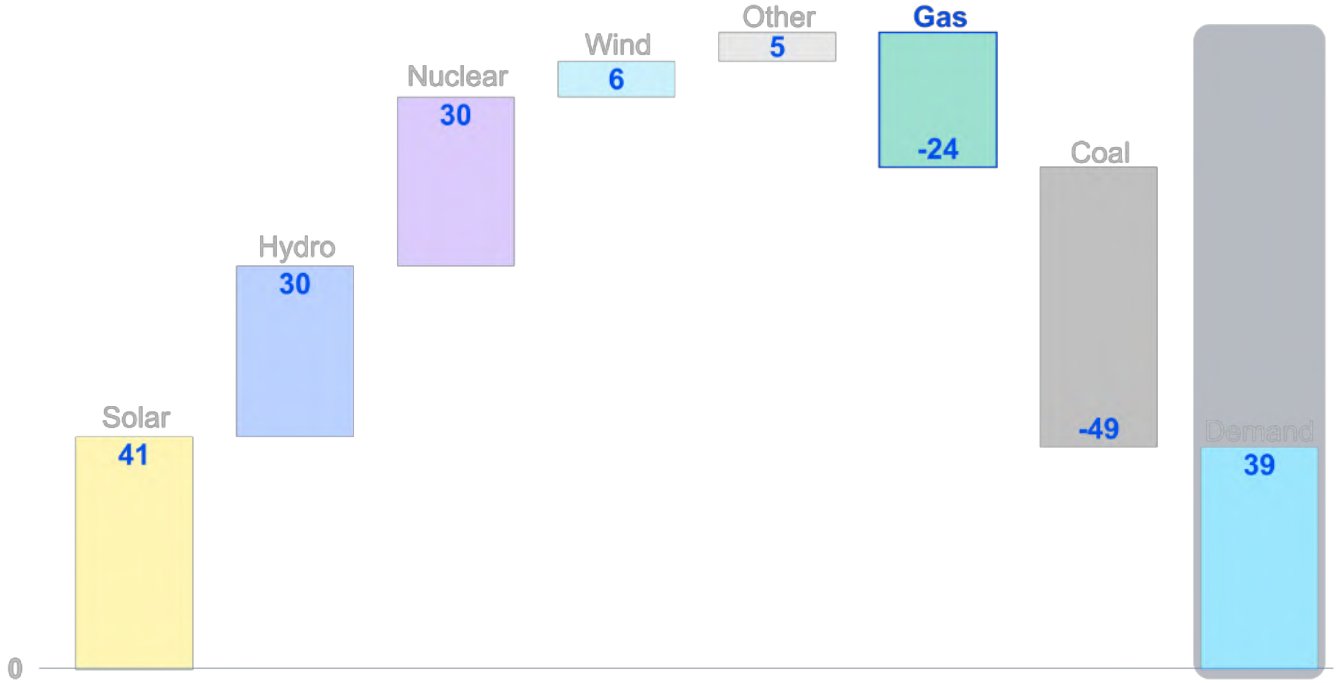
Relationship between gas and electricity is evolving

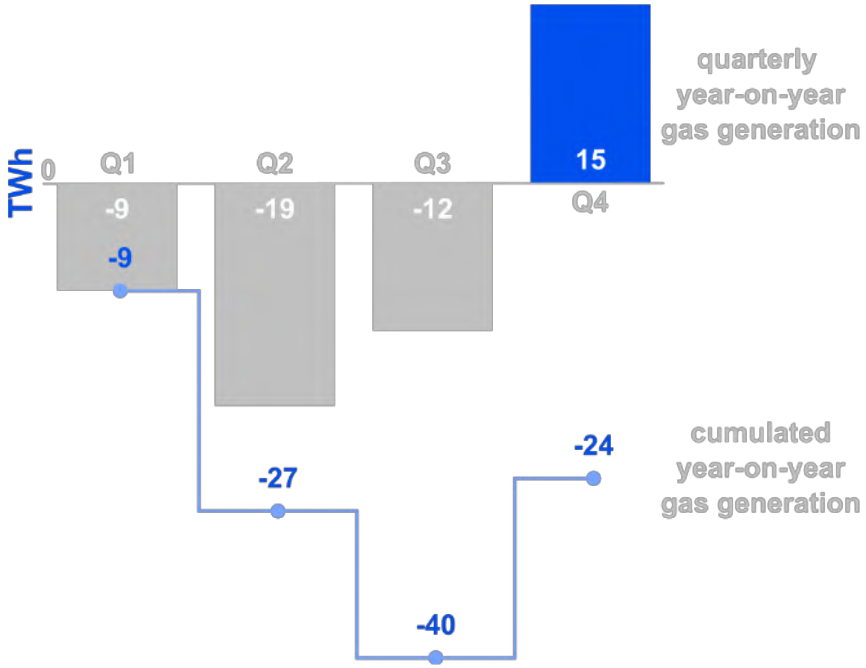
Electricity generation in 2024: Solar confirmed its leading role in the transition, whilst nuclear and hydro come back

Year-on-year changes for the main generation technologies in the EU-27/EEA(Norway), 2024 (TWh)



Adverse weather in last months of 2024 limited the decline in gas-generated electricity

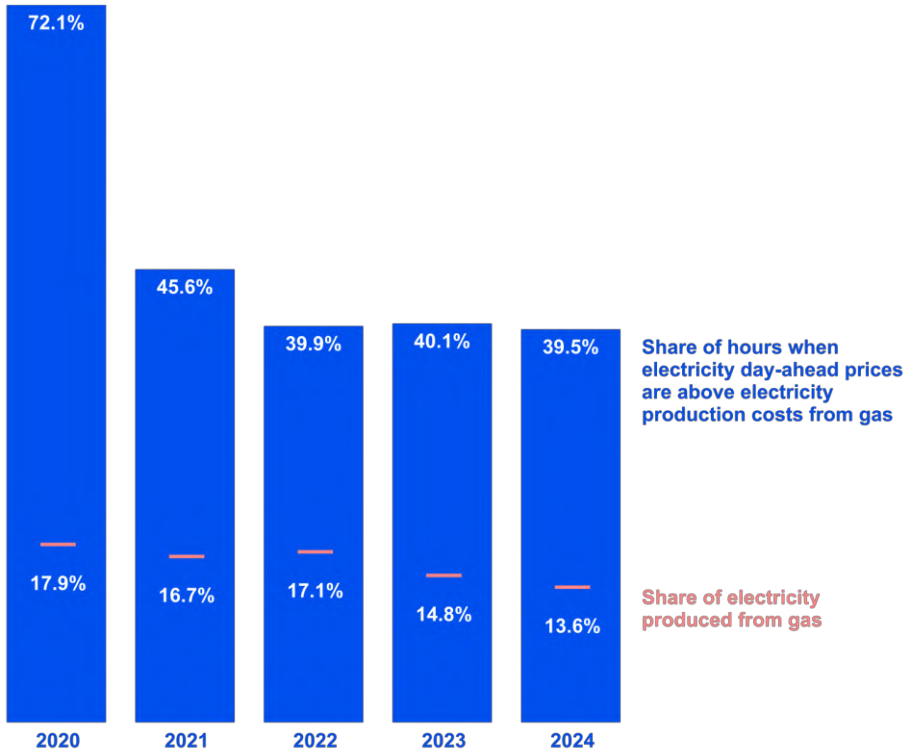
Year-on-year changes for gas generation in the EU-27/EEA(Norway), 2024 (TWh)



Gas-electricity interplay is also reflected in price dynamics

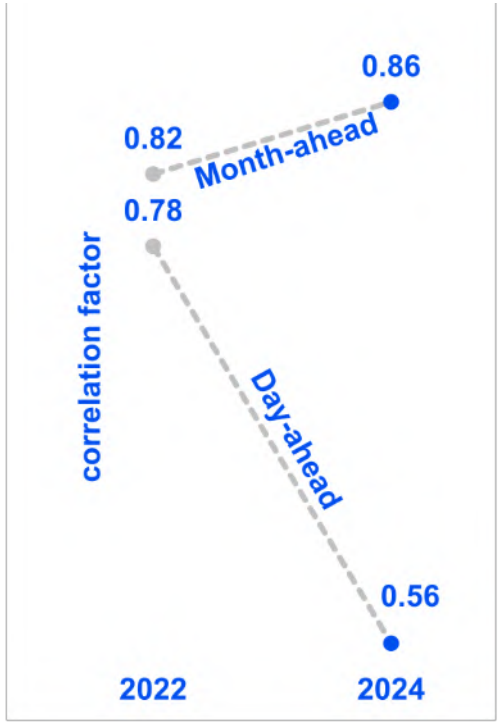
Declining role of gas in setting marginal short-term electricity prices…

Percentage of hours when electricity day-ahead prices were equal or above costs of producing electricity from gas and gas-produced electricity as a share of the total electricity production (%) on average in the EU-27 – 2020-2024[1]



… but remaining influence of gas over long-term electricity markets

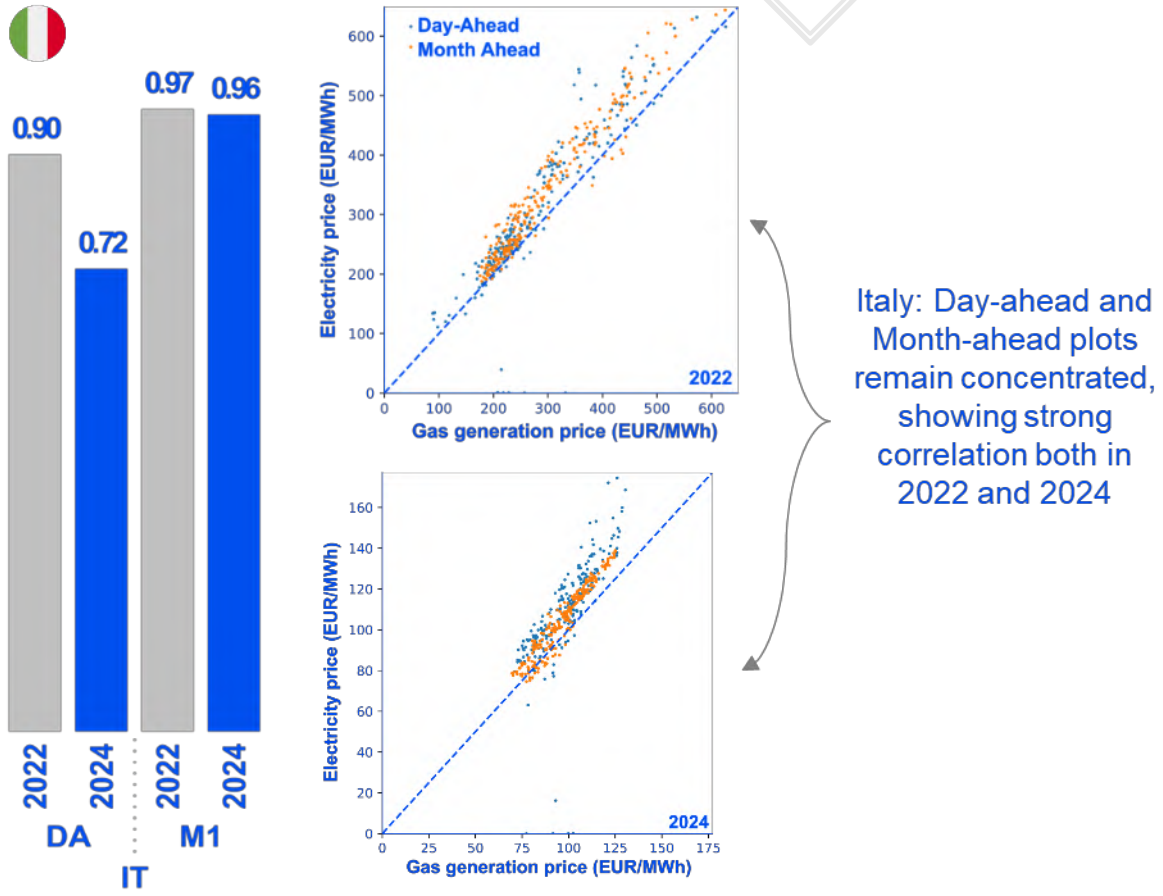
Correlation between gas and electricity month-ahead and day-ahead prices for selected member states[2] in 2022 and 2024



Source: ACER calculations based on ENTSO-E Transparency Platform.
Note 1: The cost of producing electricity from gas is obtained by applying an efficiency factor of 0.5 to gas prices and adding carbon emission allowance prices.
Note 2: Correlation of prices in EU Member States with significant data for day-ahead and month-ahead markets (AT, BE, CZ, DE, ES, FR, HU, IT, NL, PL).

Impact on Member States differ per varying electricity mix

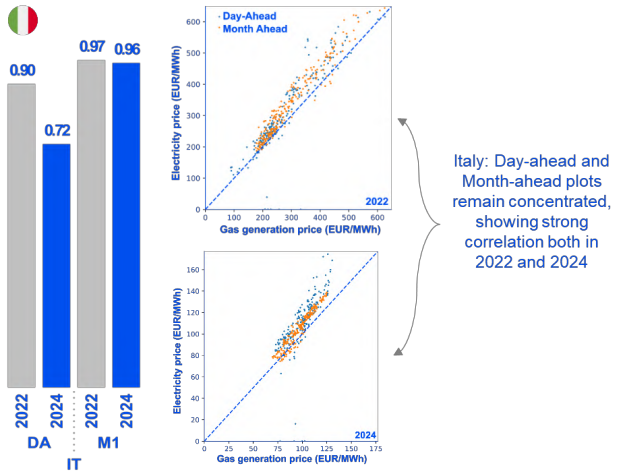
In 2024, the link between gas and electricity prices in Italy remained similar to 2022.



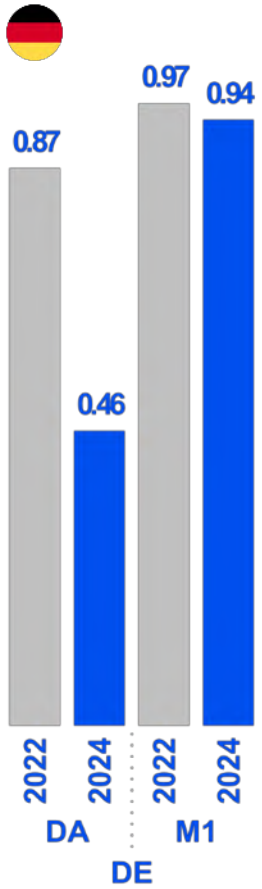
Source: ACER calculations based on ENTSO-E Transparency Platform.

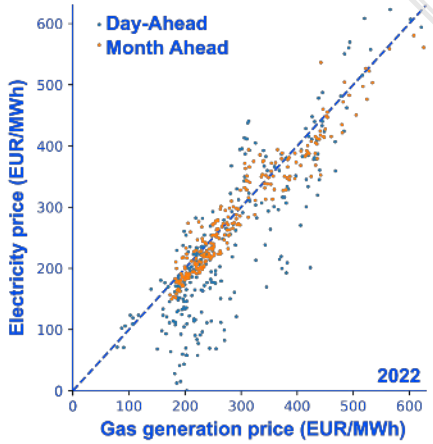
Impact on Member States differ per varying electricity mix

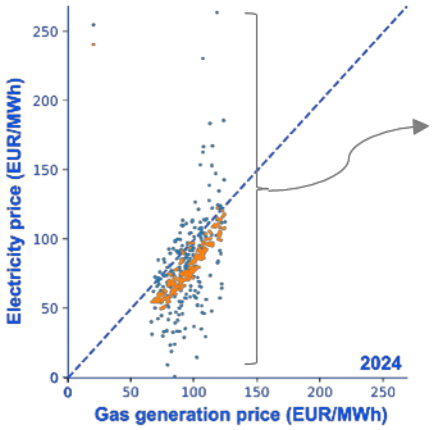
In 2024, the link between gas and electricity prices in Italy remained similar to 2022. In Germany, long-term electricity and gas prices remained closely linked, but renewable deployment has reduced gas influence on short-term electricity prices.



Italy: Day-ahead and Month-ahead plots remain concentrated, showing strong correlation both in 2022 and 2024







Germany: Day-ahead scattered plot in 2024 shows the impact of renewable energy sources

Source: ACER calculations based on ENTSO-E Transparency Platform.

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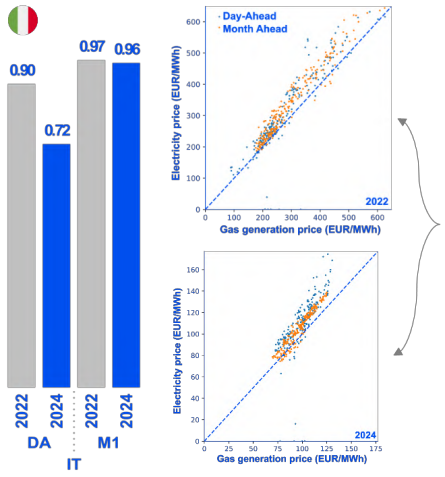
Impact on Member States differ per varying electricity mix

In 2024, the link between gas and electricity prices in Italy remained similar to 2022. In Germany, long-term electricity and gas prices remained closely linked, but renewable deployment has reduced gas influence on short-term electricity prices. In France, gas had significantly less impact on electricity prices, with the return of nuclear capacity.



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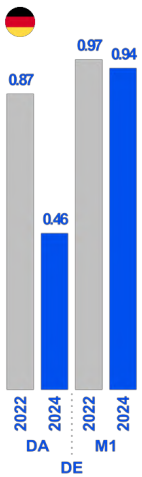

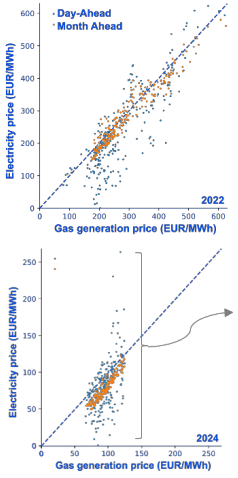

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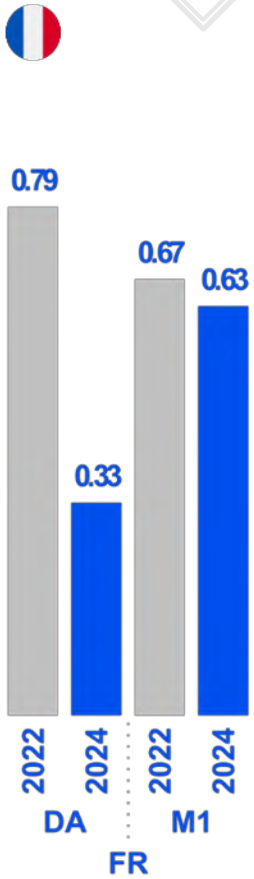
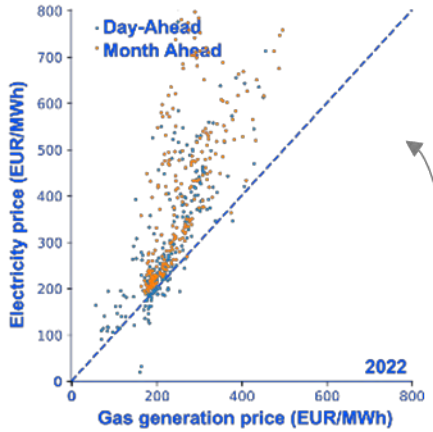
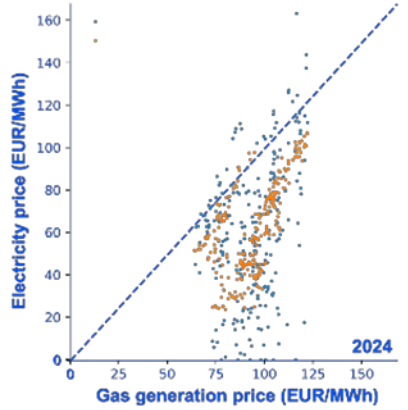




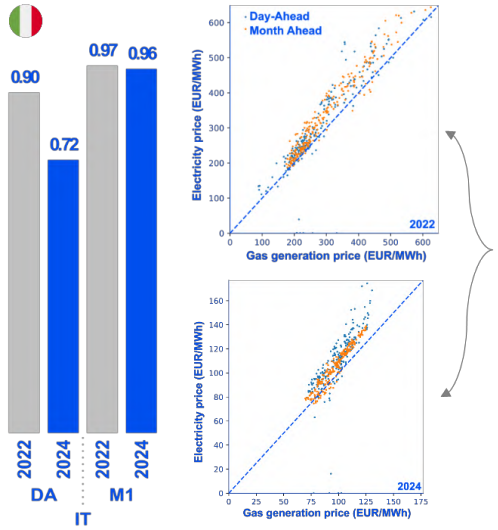


France: Day-ahead and Month-ahead plots show moderate correlation both in 2022 and 2024, revealing the importance of low carbon sources in the energy mix.

Source: ACER calculations based on ENTSO-E Transparency Platform.

Impact on Member States differ per varying electricity mix

In 2024, the link between gas and electricity prices in Italy remained similar to 2022. In Germany, long-term electricity and gas prices remained closely linked, but renewable deployment has reduced gas influence on short-term electricity prices. In France, gas had significantly less impact on electricity prices, with the return of nuclear capacity.



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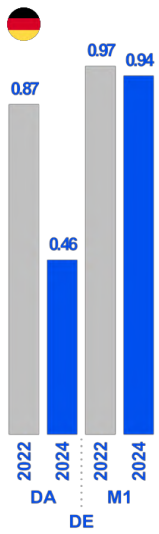

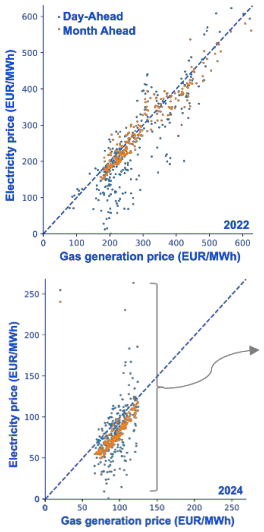

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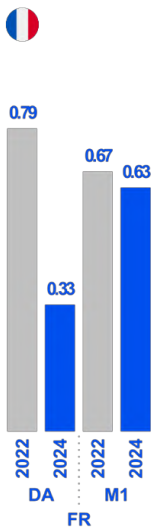

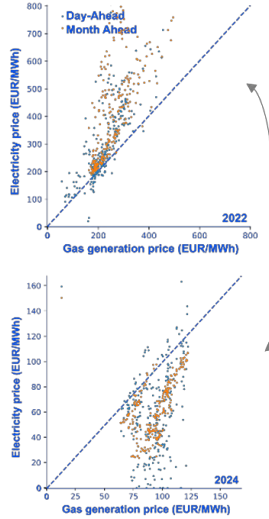

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Challenges ahead

- Electricity prices reveal a need for short-term flexibility
- Short-term flexibility solutions exist; uptake must grow
- Seasonal flexibility remains ensured by gas

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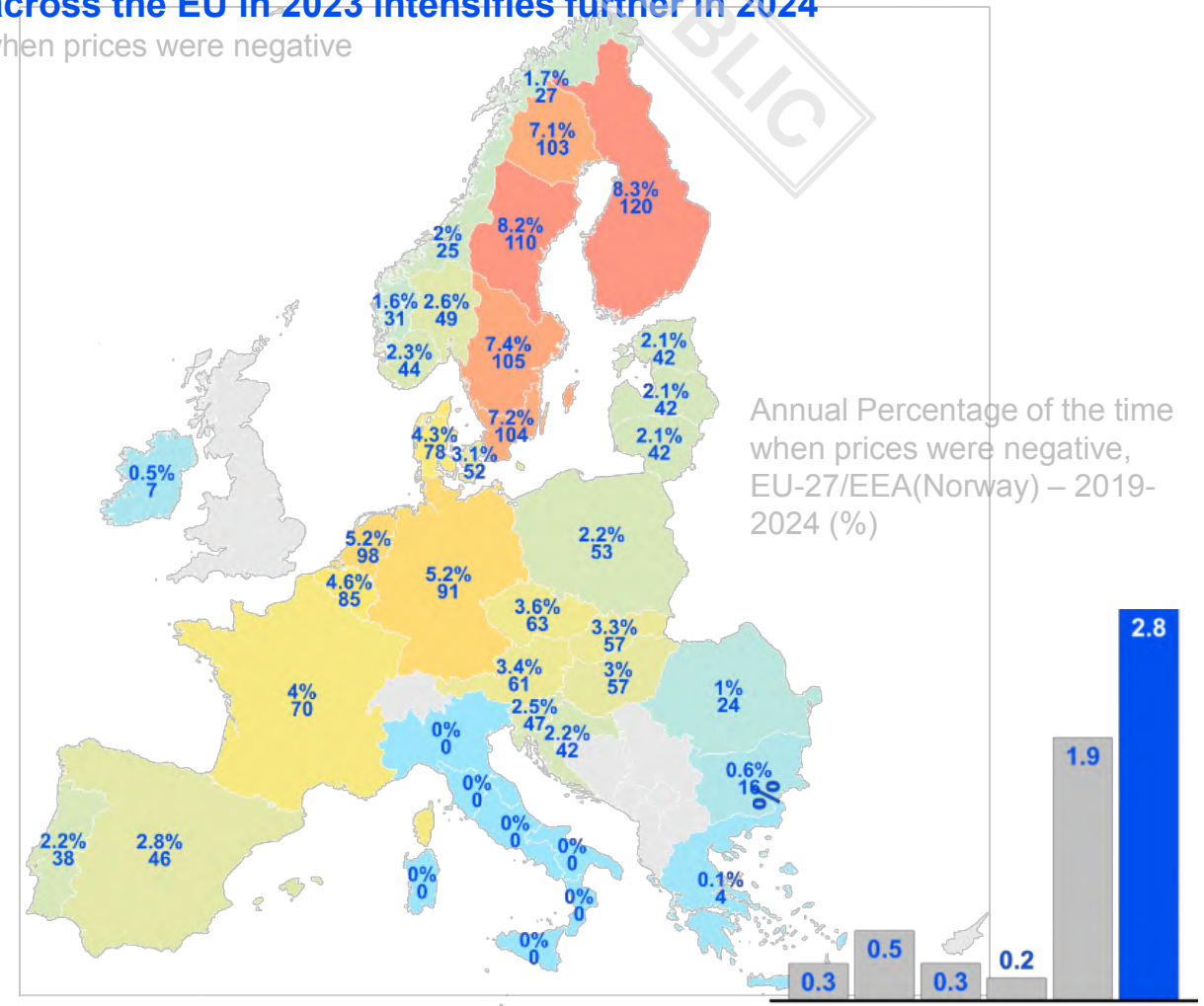
In 2024, negative and very-low electricity prices increased

Surge in negative electricity prices across the EU in 2023 intensifies further in 2024

Percentage of the time and number of days when prices were negative
EU-27/EEA(Norway), 2024



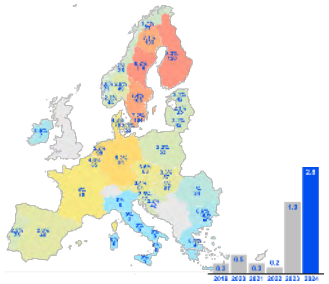
Source: ACER calculations based on ENTSO-E transparency platform.

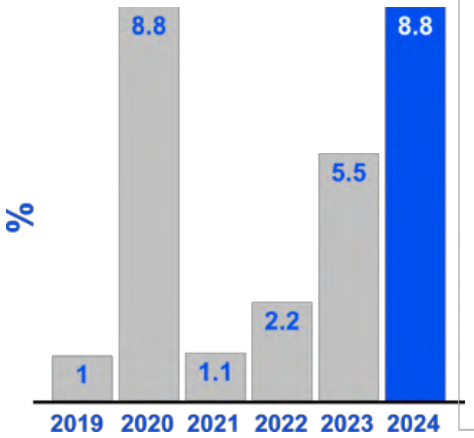
In 2024, negative and very-low electricity prices increased

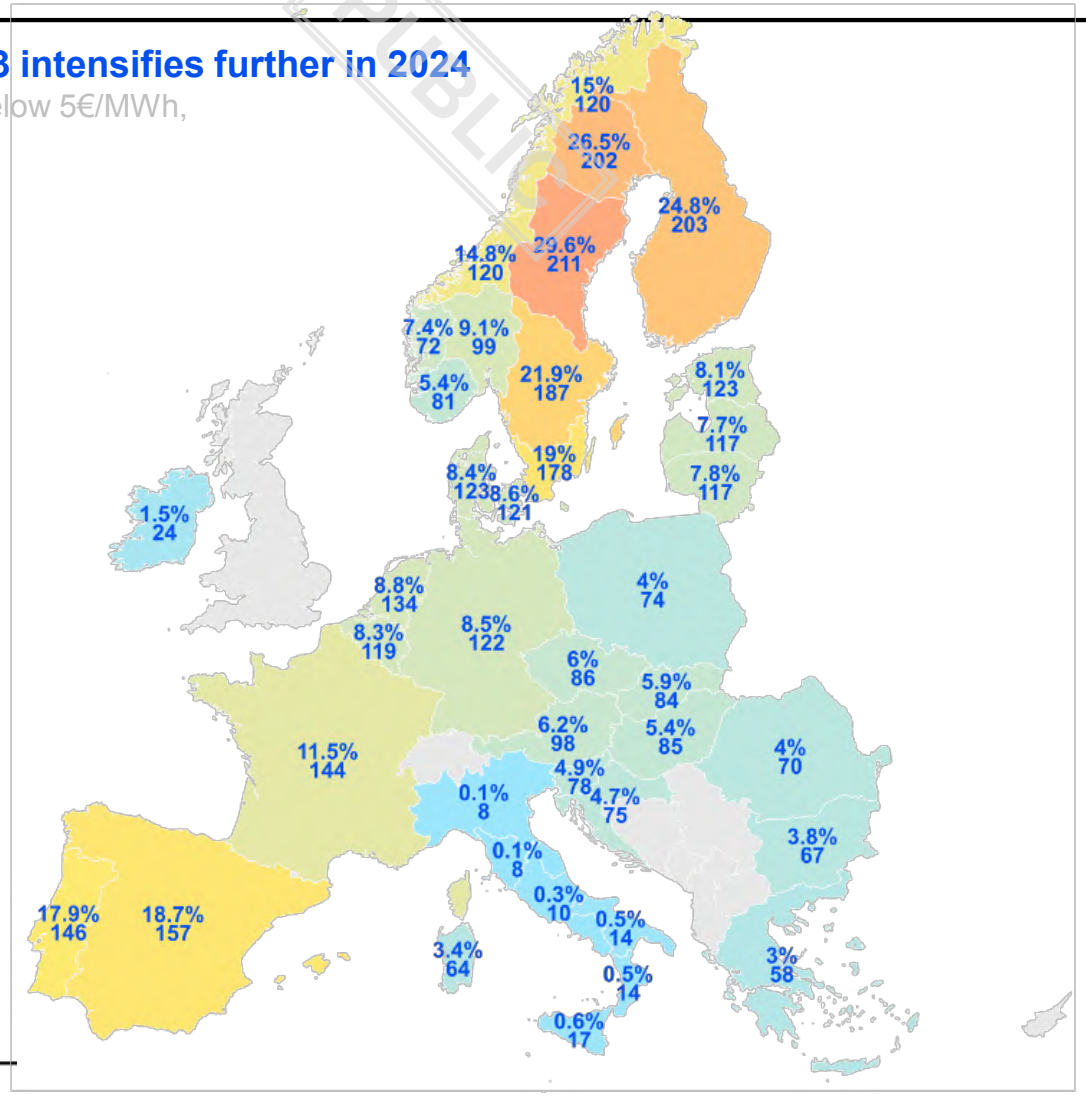
Surge in low electricity prices across the EU in 2023 intensifies further in 2024

Percentage of the time and number of days when prices were below 5€/MWh, EU-27/EEA(Norway), 2024

Annual Percentage of the time when prices were <5EUR/MWh, EU-27/EEA(Norway), EU-27/EEA(Norway) – 2019-2024 (%)







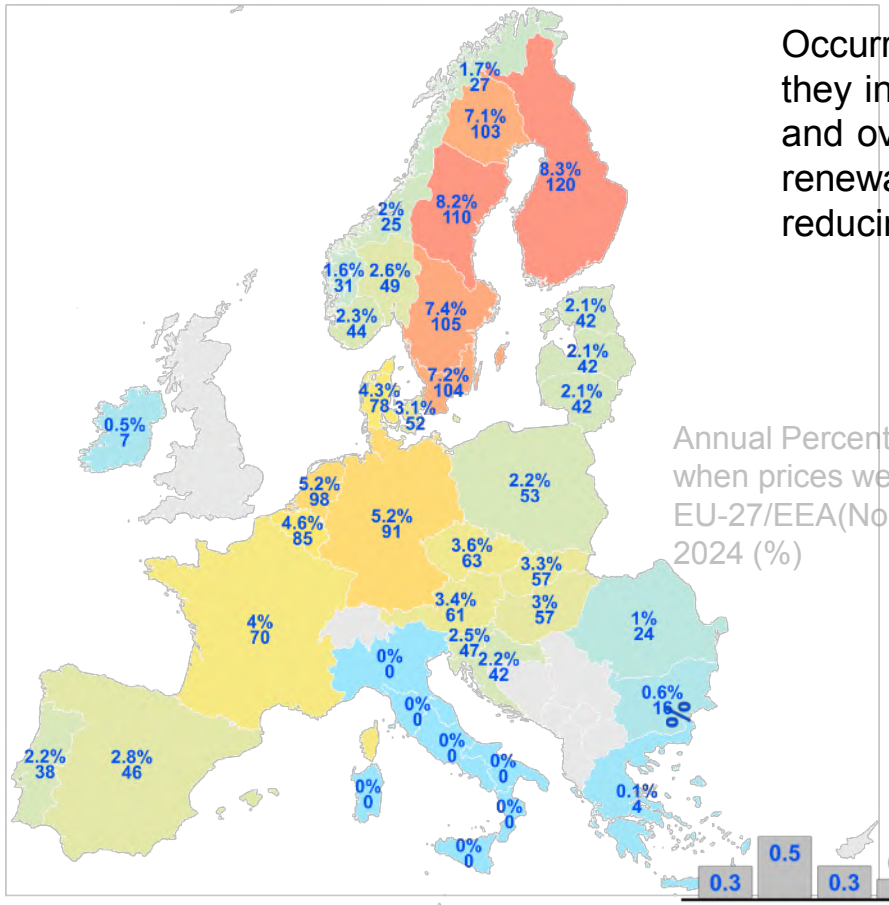
Source: ACER calculations based on ENTSO-E transparency platform.

In 2024, negative and very-low electricity prices increased

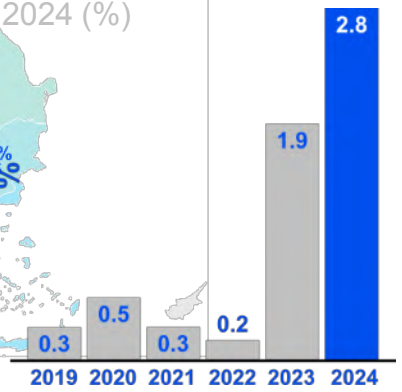
Surge in negative and low electricity prices across the EU in 2023 intensifies further in 2024

Percentage of the time and number of days when prices were negative (left) and below 5€/MWh (right), EU-27/EEA(Norway), 2024

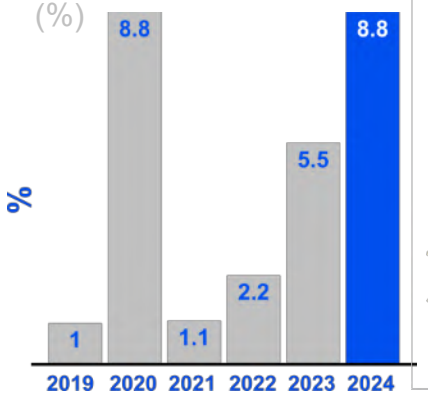
Occurrences of negative prices had risen by 12 times in 2023; they increased further by half in 2024. Better subsidy designs and overall tariffs reflecting local constraints could encourage renewable producers to align output with system needs, reducing negative price episodes.

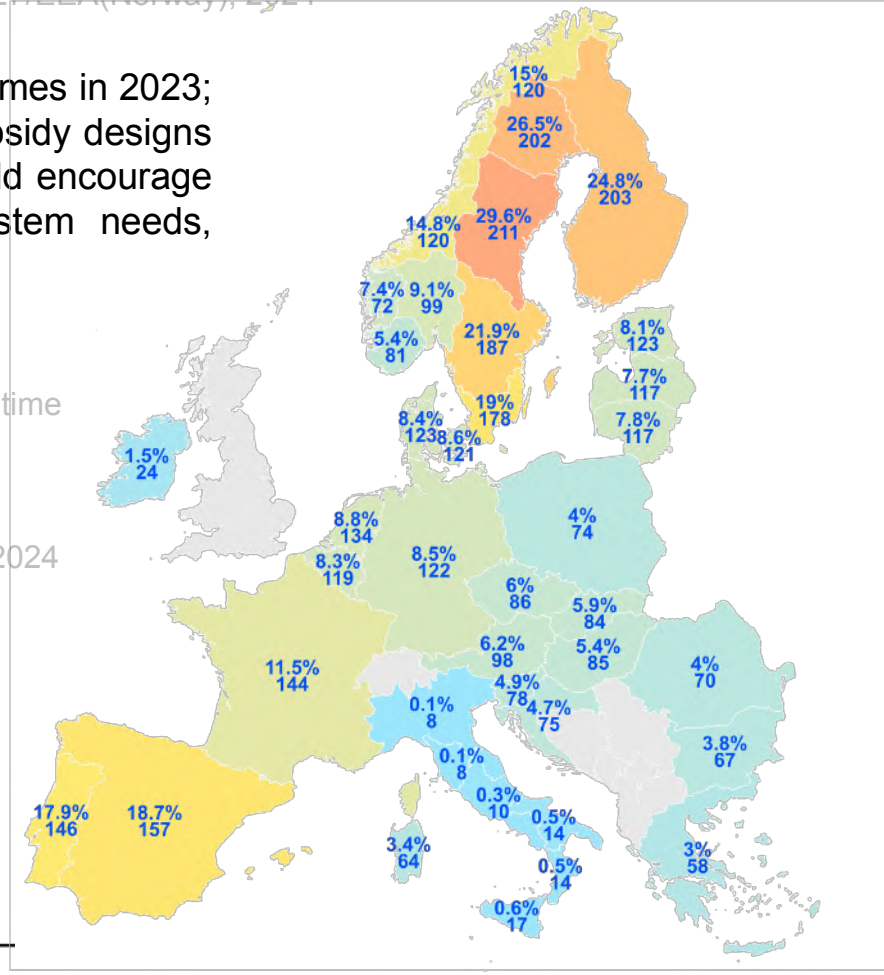


Annual Percentage of the time when prices were negative, EU-27/EEA(Norway) – 2019-2024 (%)



Annual Percentage of the time when prices were <5EUR/MWh, EU-27/EEA(Norway), EU-27/EEA(Norway) – 2019-2024 (%)



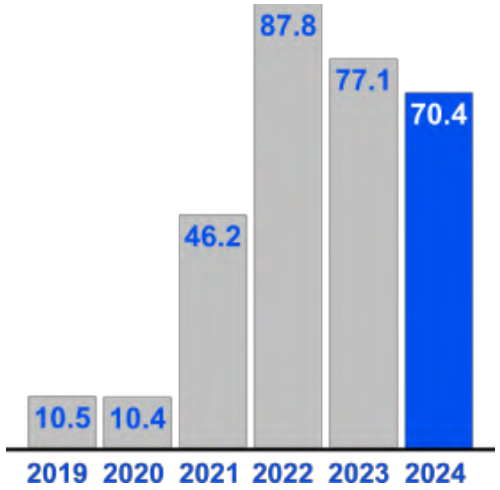


Source: ACER calculations based on ENTSO-E transparency platform.

Electricity prices reveal a need for short-term flexibility

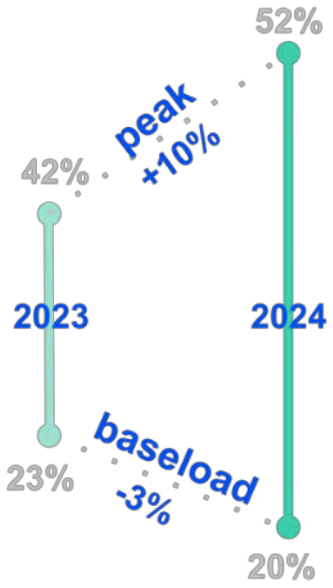
High electricity price swings remained frequent…

Annual percentage of days when price variation per day was greater than 50 EUR/MWh, EU-27/EEA(Norway) – 2019-2024 (EUR/MWh)



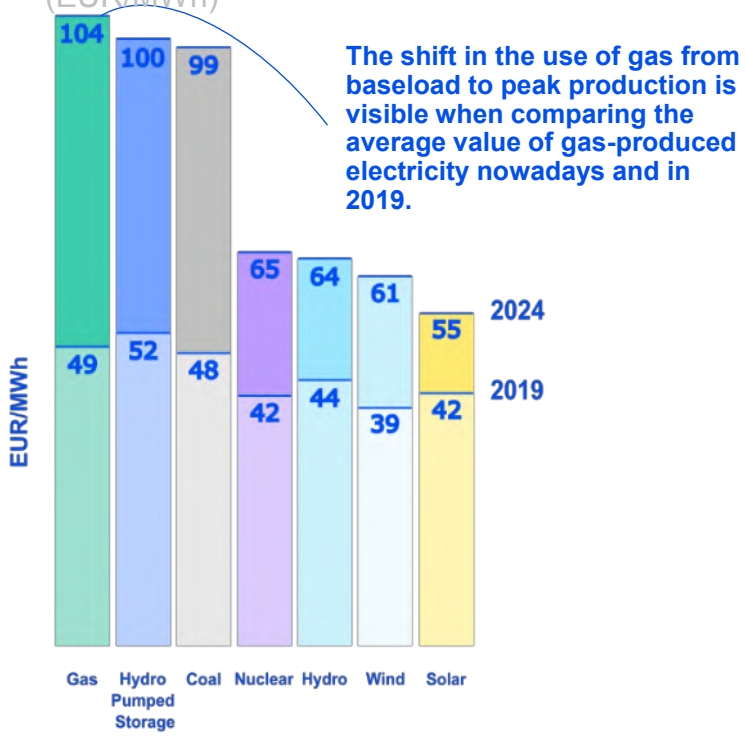
… demand for flexible gas supply increased...

Capacity factors of gas-fired power plants, EU-27/EEA(Norway), 2023-2024 (%)



…general use of fossil fuel technologies for flexibility

Average value of electricity by production type* in the EU-27/EEA(Norway), 2024 (EUR/MWh)



Within-day electricity price swings show supply-demand shifts, manageable with short-term flexibility.

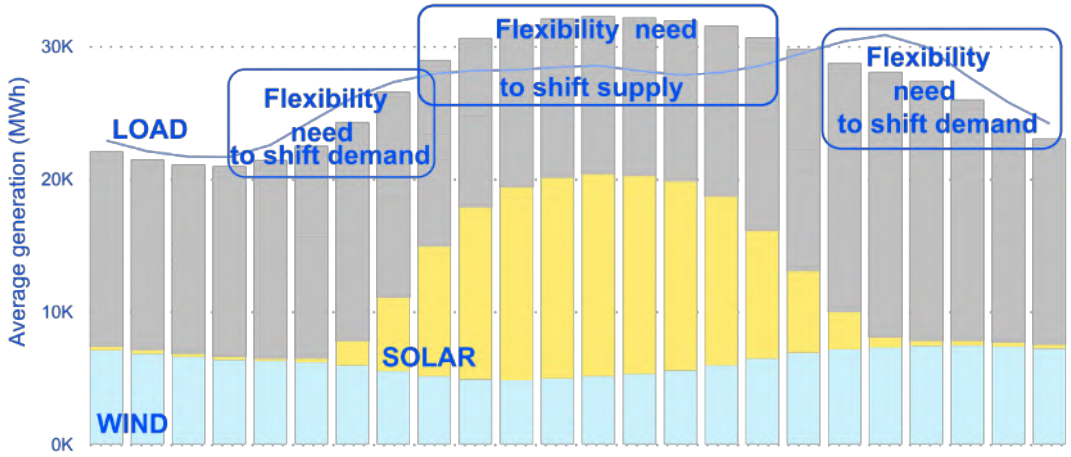
Source: ENTSO-E transparency platform.

Short-term flexibility solutions exist; uptake must grow

The gap between midday solar oversupply and evening demand is growing.

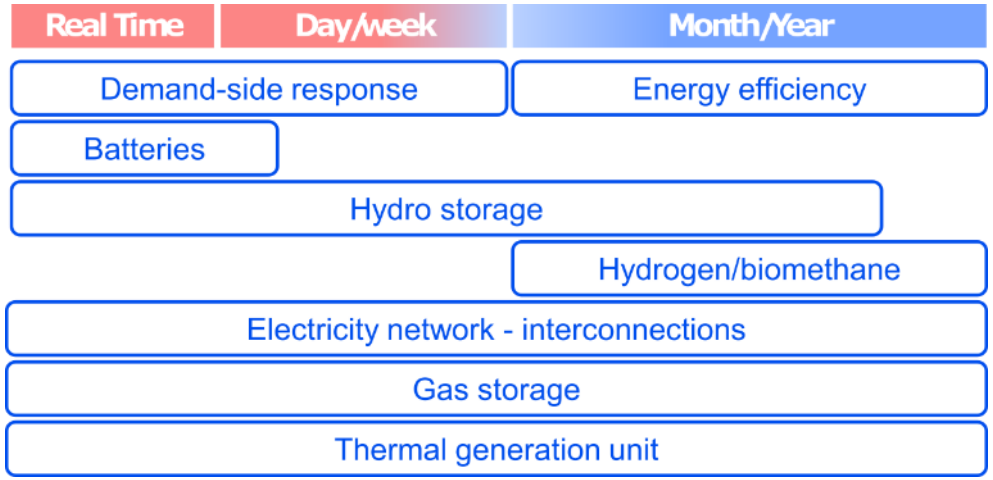
Renewables induce short-term flexibility needs

Hourly averages of energy generation in Spain, 2024 (MWh)



Demand-response, interconnections and batteries are key

Flexibility services provided by various technologies, sorted according to their duration



In real time, the gap between midday solar oversupply and evening demand is growing. Solutions exist to manage this gap e.g. access to demand-side response[1], battery deployment, and cross-border trade through interconnections[2]. For longer-term flexibility, the role of gas storage remains central.

Note: 1. See the ACER report on Demand response and other distributed energy resources (December 2023) and the upcoming ACER report on No-regret measures to remove barriers to demand response (April 2025) 2. See the yearly ACER report on Capacities for cross-zonal electricity trade and congestion management.

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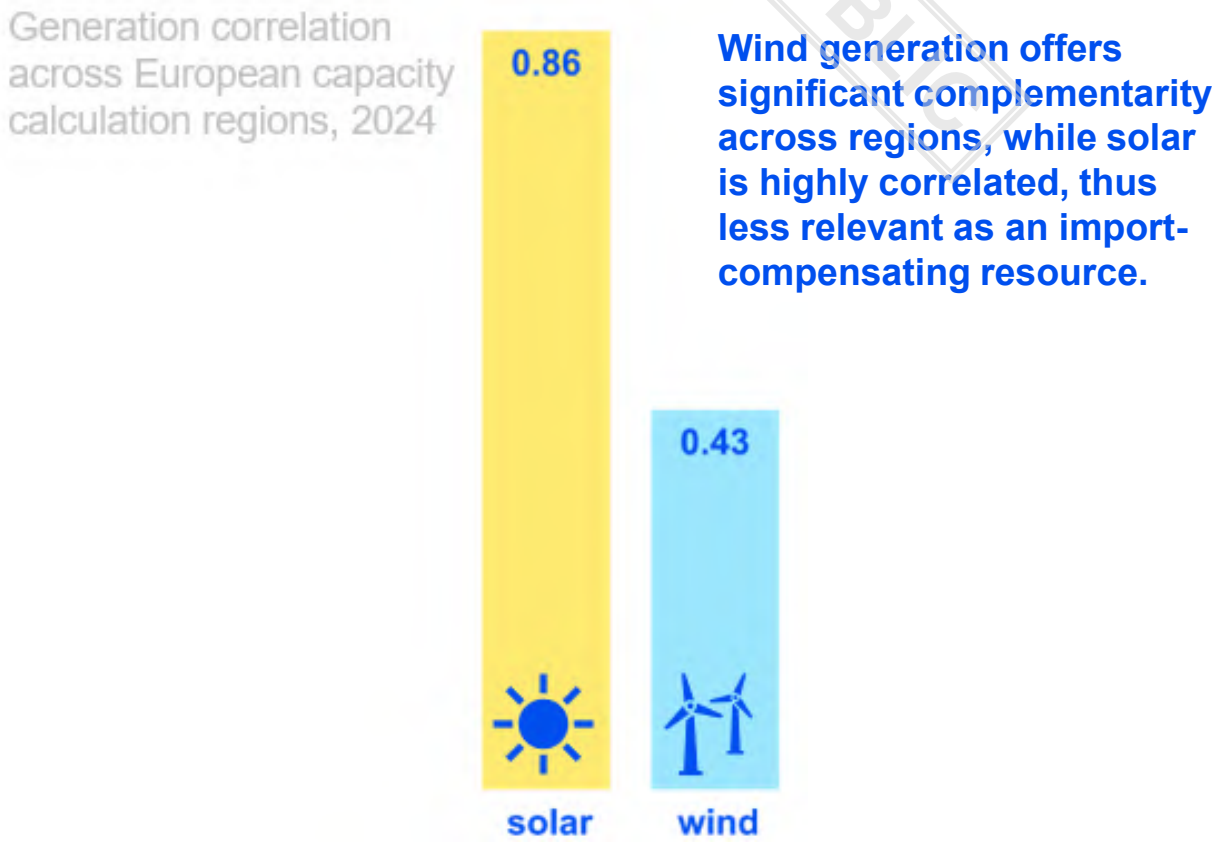
Example: enhanced regional coordination of renewables



Wind generation offers significant complementarity across regions, while solar is highly correlated, thus less relevant as an import-compensating resource.

Wind generation is more regionally complementary than solar, which relies more on storage uptake in high-solar saturation areas for capturing value. Better coordination of wind and solar across Europe can raise capacity factors and reduce variability.

Source: ENTSO-E transparency platform + Bruegel policy brief from 14 February 2024 (previous slide).

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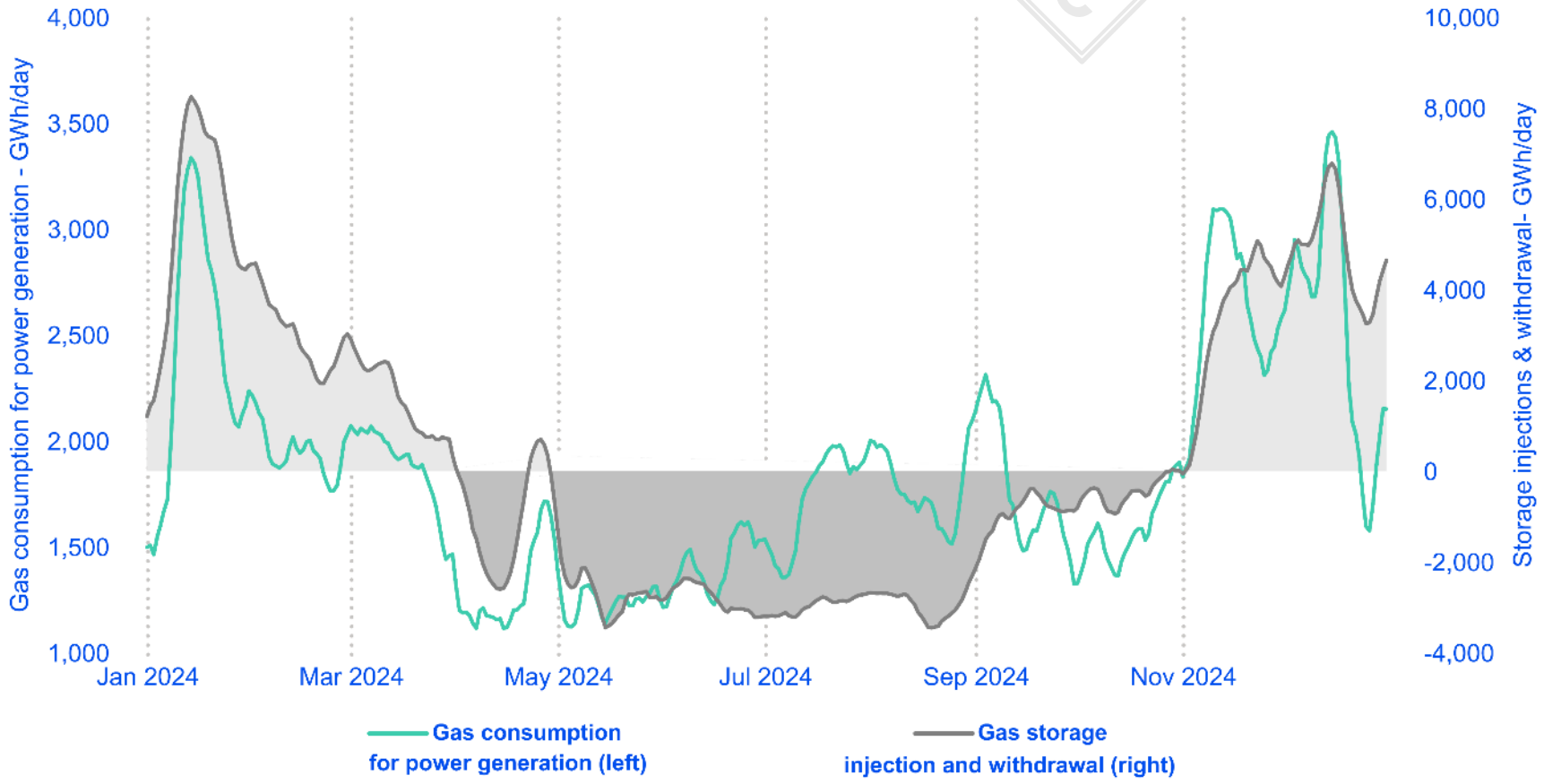
Seasonal flexibility is ensured by gas

Gas storage is vital for Europe's supply security and stability.

Gas consumption for power generation and storage net withdrawals (GWh/day)



Source: ACER based on Gas Infrastructure Europe and ENTSO-E data.
Note: Gas consumption for power generation is calculated from electricity generation data assuming 50% efficiency of gas power plants. Both of the time series displayed are seven day rolling averages.

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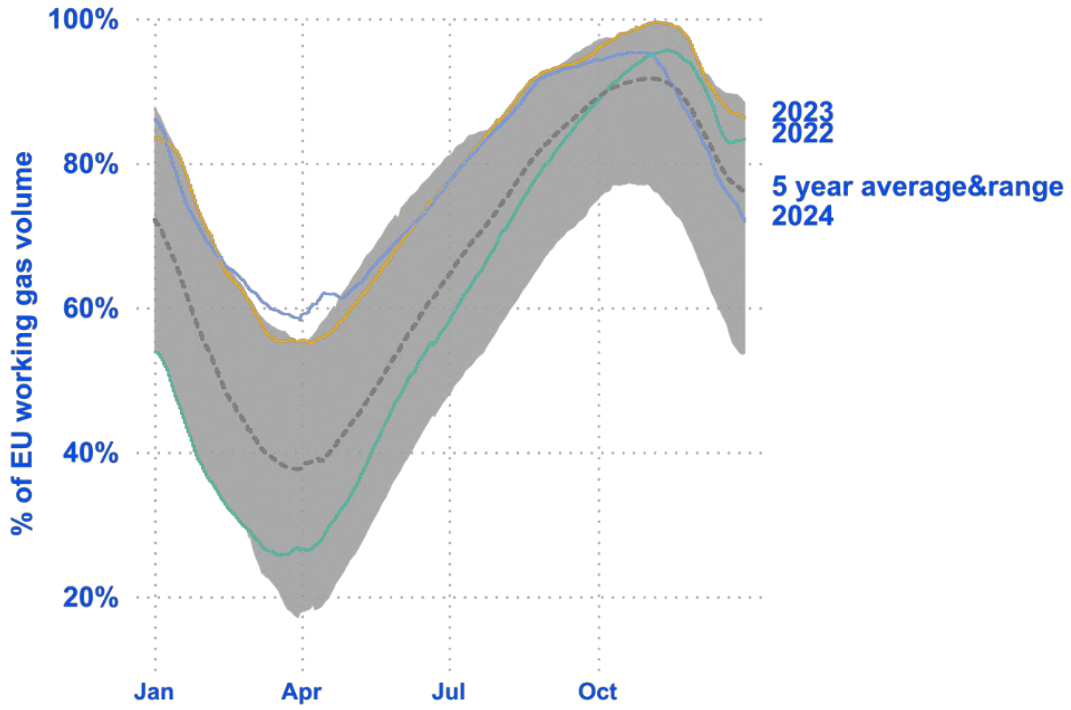
Greater use of storages has implications for summer prices

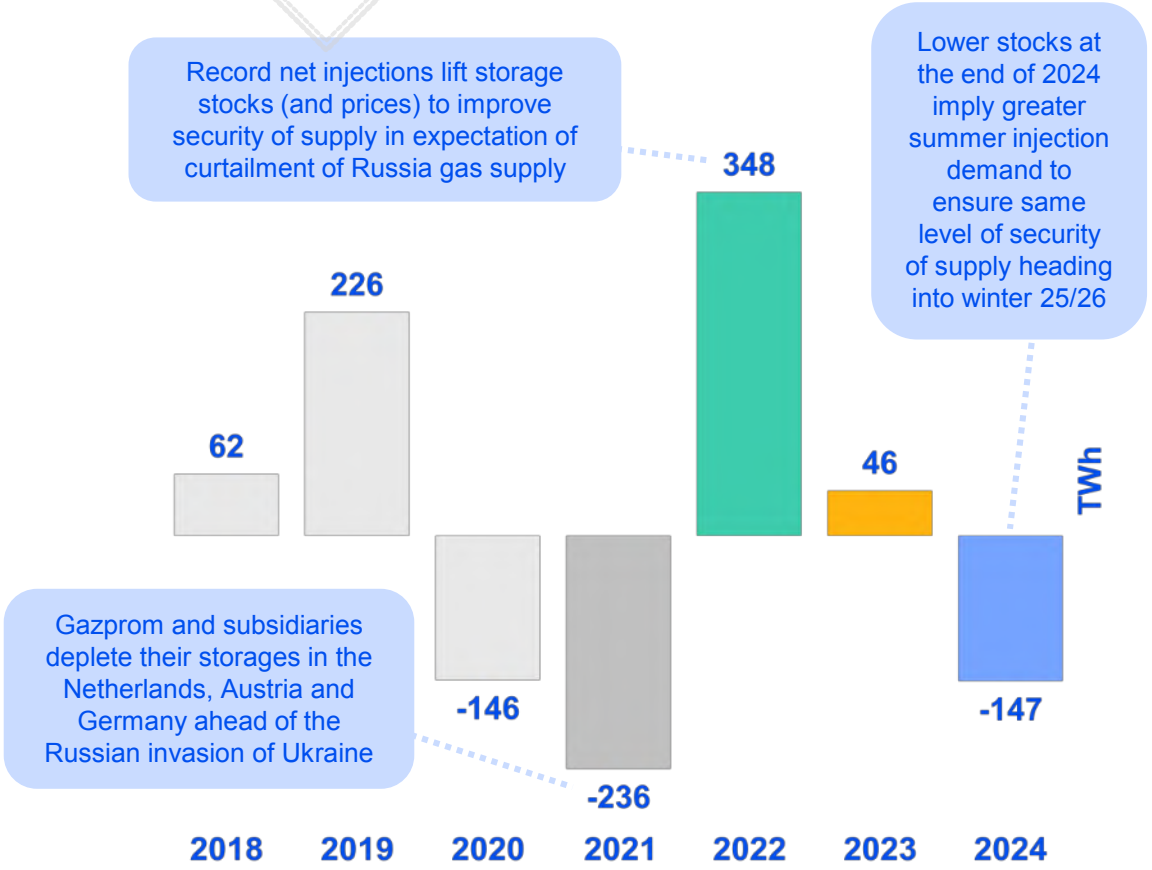
Record stocks at start of 2024 were followed by reduced injections over summer and increased withdrawals at start of winter …

Gas storage levels, 2018-2024 (% of EU working gas volume)



… implying greater injection demand in 2025 that could keep prices high thought-out summer

Yearly EU storage net injections 2018-2024 (TWh)



Source: ACER based on Gas Infrastructure Europe.

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How will ACER contribute in 2025?

Average electricity grid costs for consumers could nearly double by 2050[1]

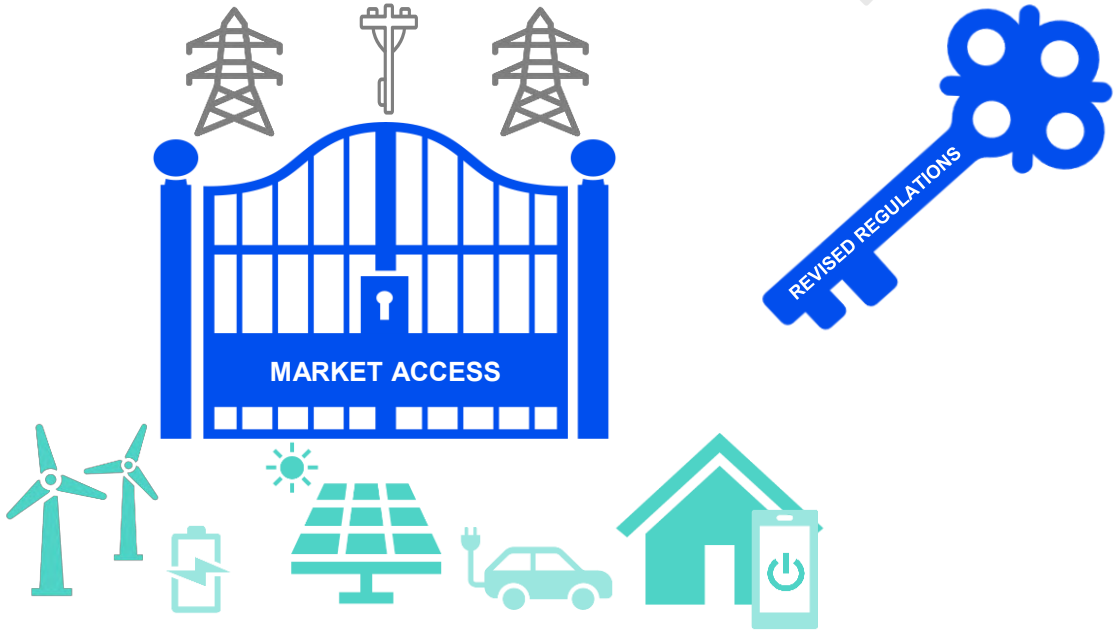
Evolution of total grid costs (EUR/MWh)

ACER's report on best practices regarding network tariffs (March)

Source: EMBER.
Note 1: Legacy grid costs cover historic investment and decrease by further depreciating assets while new grid costs represent investment between 2050. Estimates give the order of magnitude. They are sensitive to many assumptions and based on partial data.
Note 2: See the 2024 ACER report on electricity infrastructure.

April…

12 actions to unlock flexibility in the electricity markets at the national level

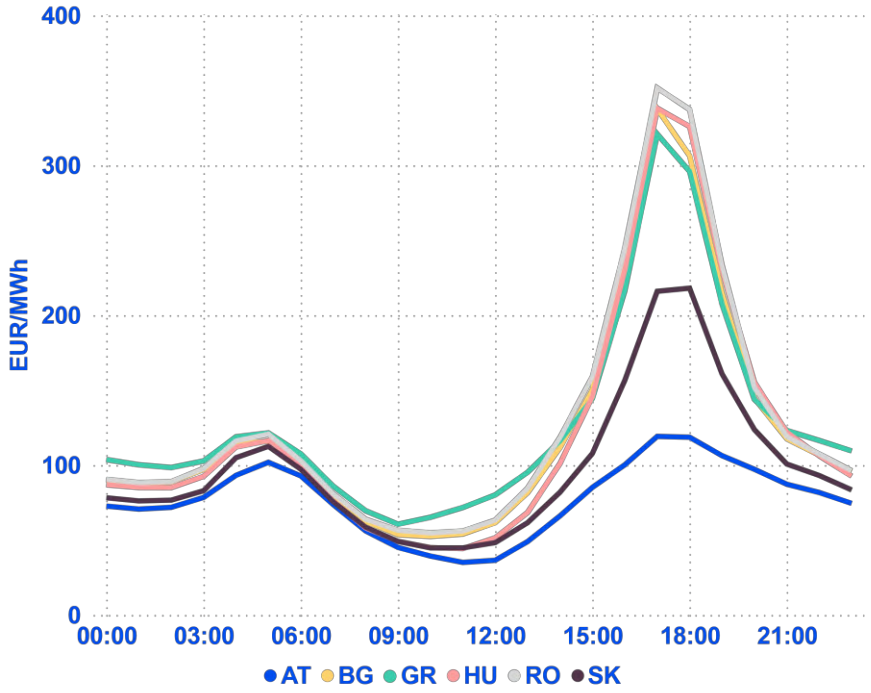


ACER's "Unlocking flexibility" report: No-regret measures to remove barriers to demand response (April)

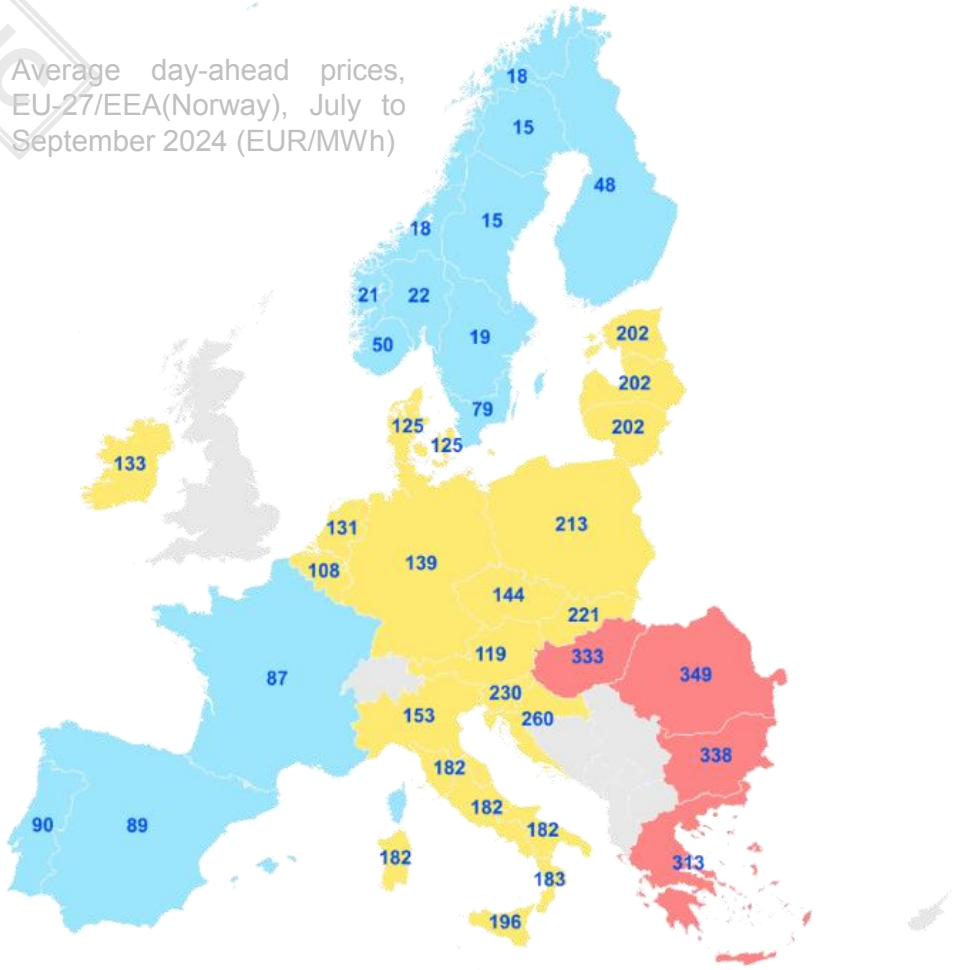
July…

From mid-July to mid-September, southern and central eastern Europe experienced sustained high evening day-ahead prices, with price decorrelation from western-European bidding zones.

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



Average day-ahead prices, EU-27/EEA(Norway), July to September 2024 (EUR/MWh)



Source: ACER calculations based on ENTSO-E Transparency Platform.

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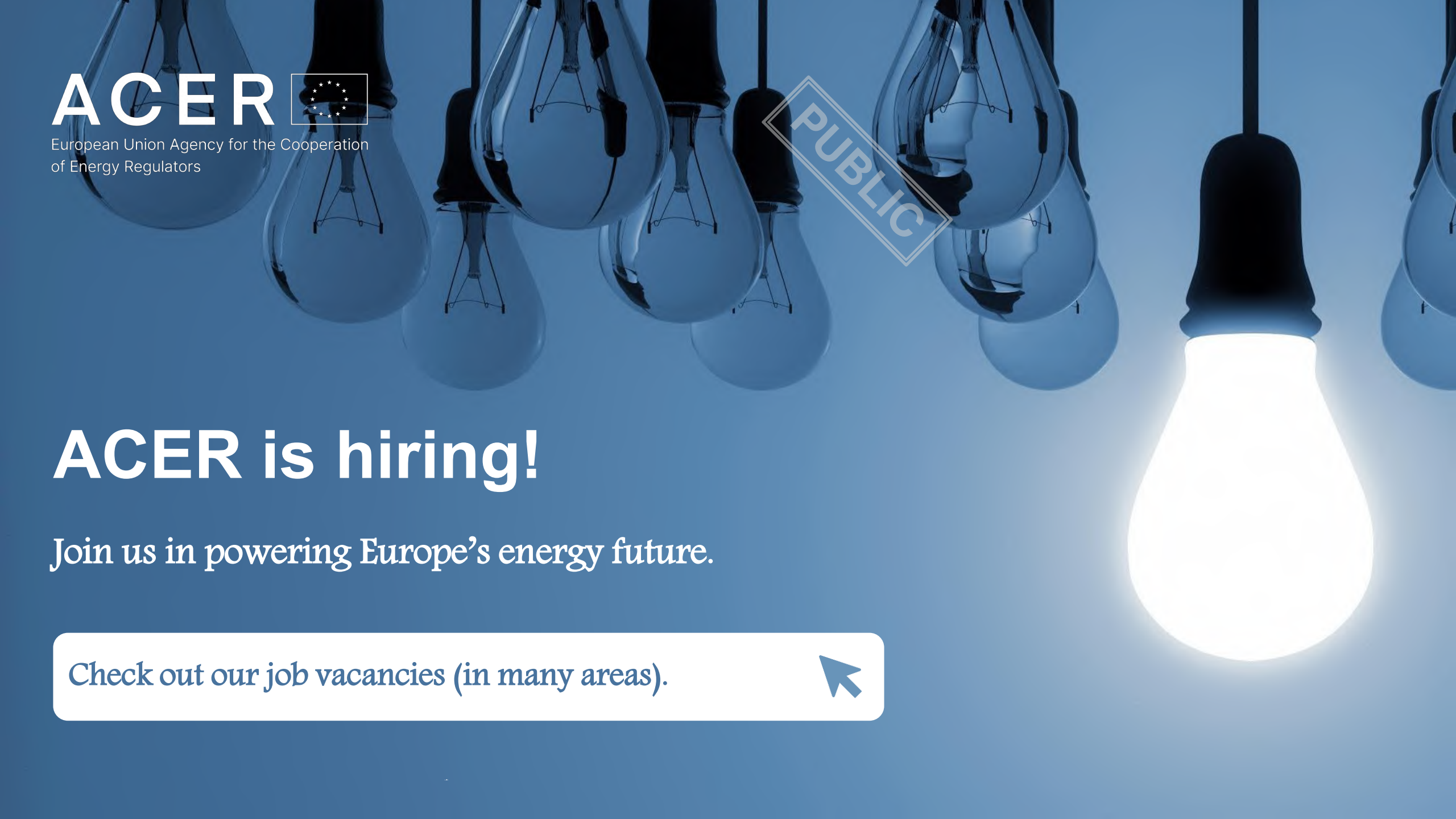
Stay tuned for more …

	Informing policy considerations	Monitoring
ELECTRICITY	• Recommendations: Demand response rules; improving the monitoring, investigation and enforcement framework (December) • Implementation of 15 min market time unit trading in EU-wide day-ahead and intraday markets (June) • Assessment of peak shaving products in normal conditions (June) • Opinion on the bidding zone review study (July) • Policy Paper on infrastructure cost benefit sharing (December)	• No-regret measures to remove barriers to demand response (April) • Network codes implementation delays (ad-hoc updates) • Market integration and cross-zonal capacity report (July) • Regional coordination centres report (March) • Balkan black-out investigation
GAS, HYDROGEN AND RETAIL	• Recommendation on intertemporal cost allocation (July) • Network codes 2.0 (CAM and CMP guidelines amendments) • LNG methodology update	• Gas monitoring quarterly • LNG (May) • Capacity/congestion (June) • Hydrogen market (October) • Retail gas country sheets (July)
ENERGY SYSTEM NEEDS	• Adoption of the flexibility needs methodology (July) • Guidance on Distribution Network development plans (July)	• Implementation of the ITC mechanism (March) • Best practices network tariffs report (March) • PCI monitoring (April) • Security of supply report (November)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