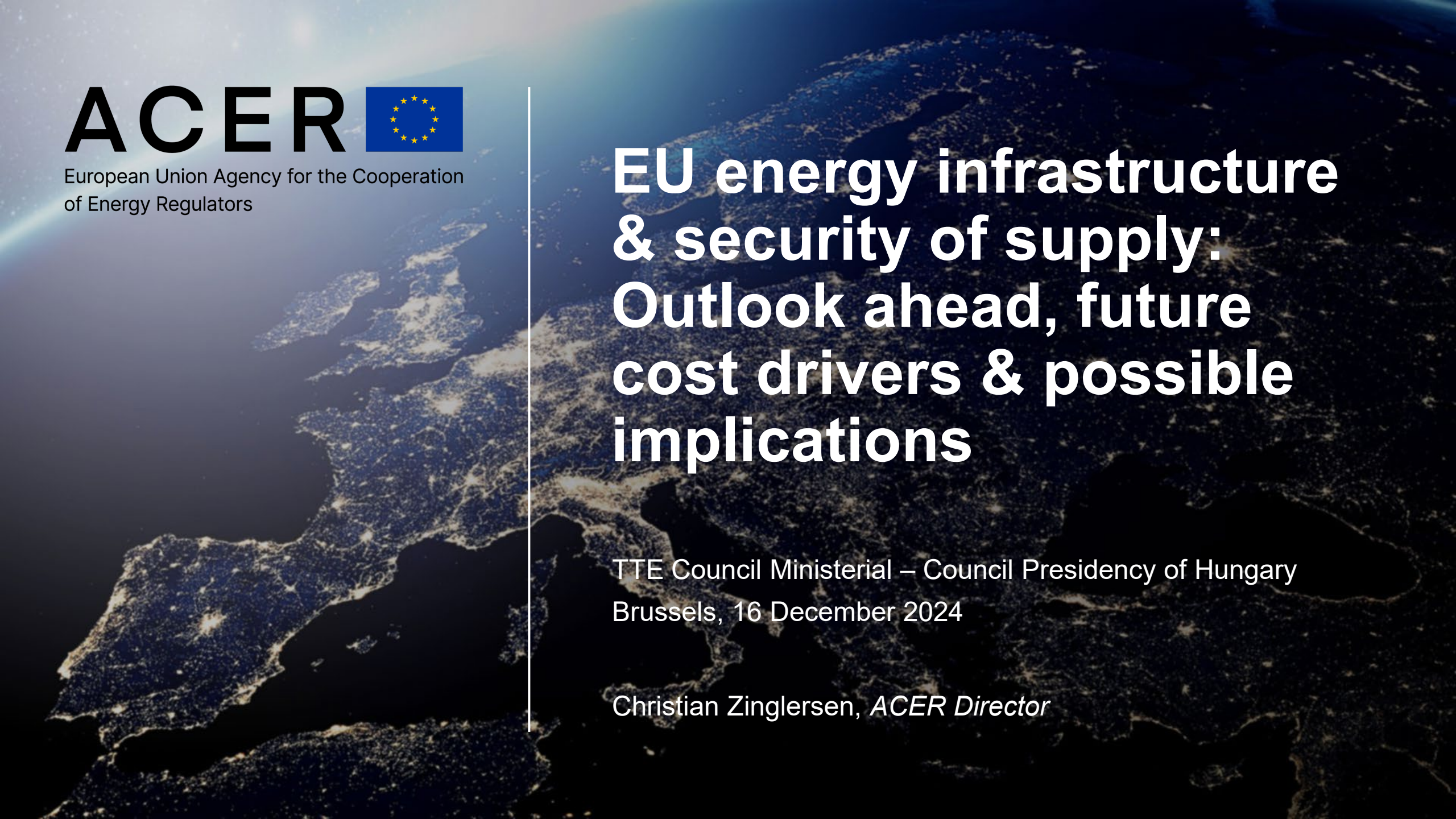

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EU energy infrastructure & security of supply: Outlook ahead, future cost drivers & possible implications

TTE Council Ministerial – Council Presidency of Hungary

Brussels, 16 December 2024

Christian Zinglersen, *ACER Director*

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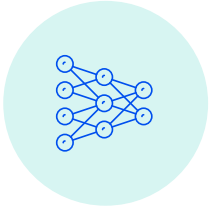
Agenda



Infrastructure – a double challenge

Security of electricity supply – upsides & downsides

***Case in point?* – price volatility in Central & Eastern Europe**

Starting with two over-arching themes …

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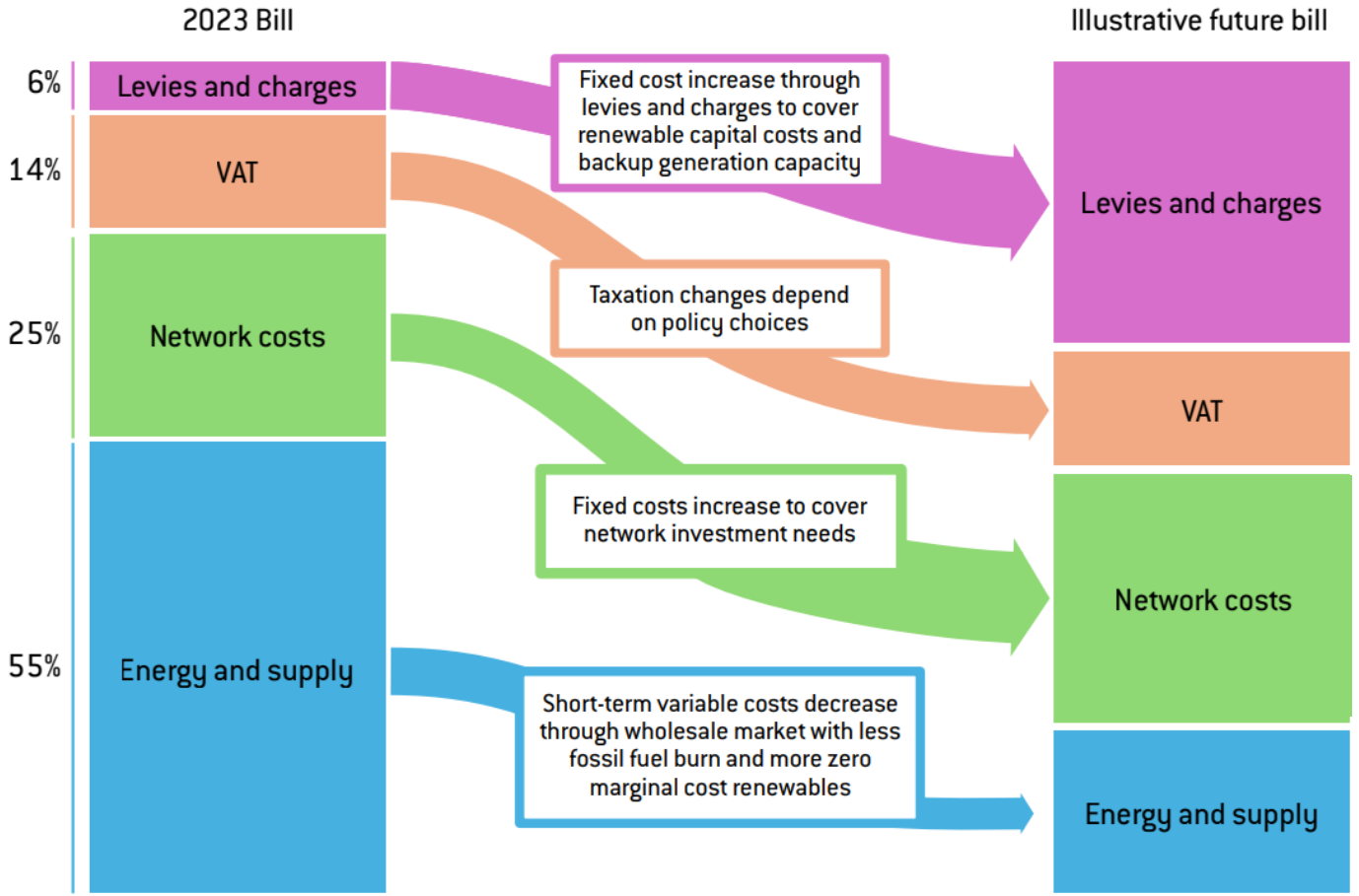
Shift in cost drivers ~ shift in focus?

Expected changes in electricity cost components with the energy transition



Source: Bruegel, Decarbonising for competitiveness: four ways to reduce European energy prices, December 2024.

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Shift in cost drivers ~ shift in focus?

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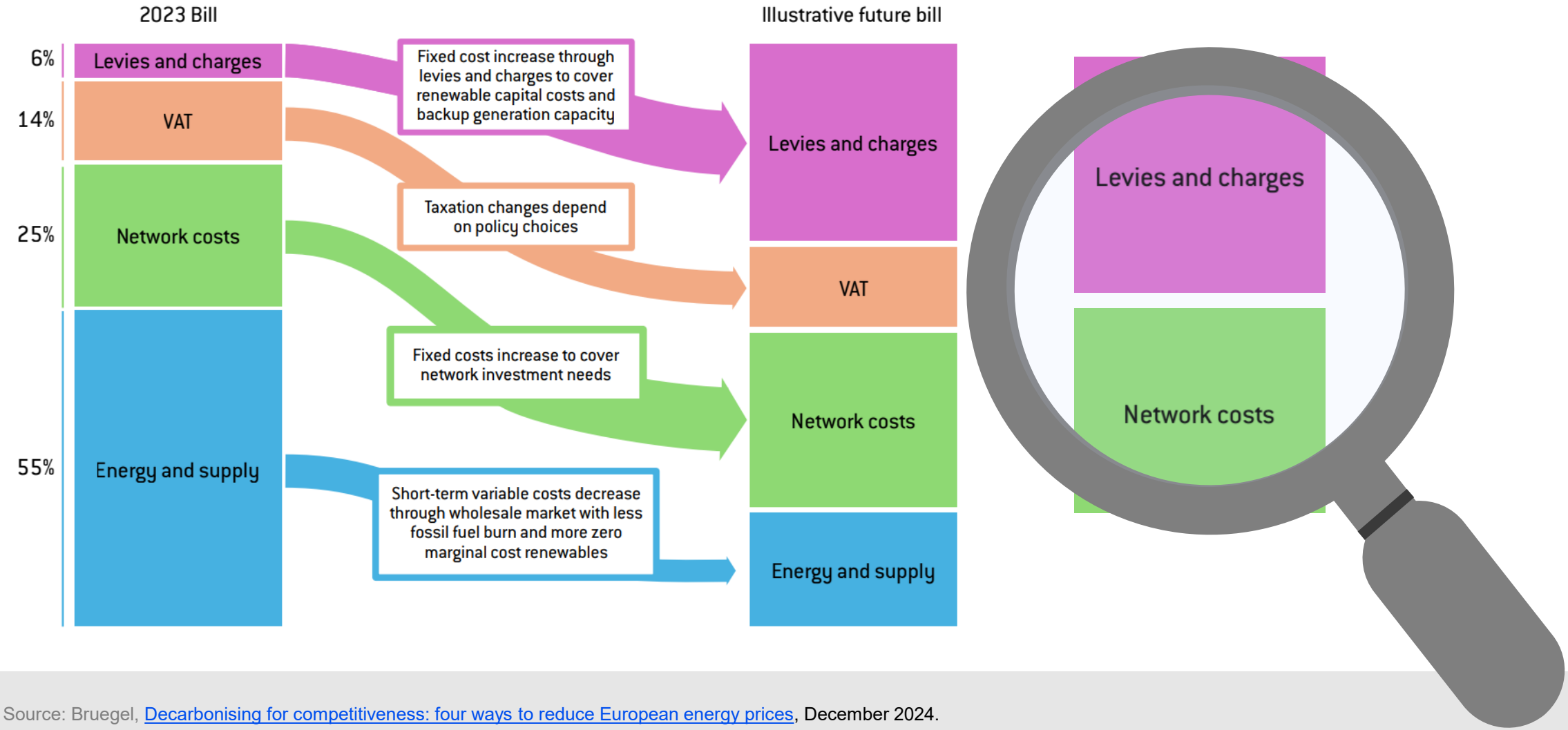

Source: Bruegel, Decarbonising for competitiveness: four ways to reduce European energy prices, December 2024.

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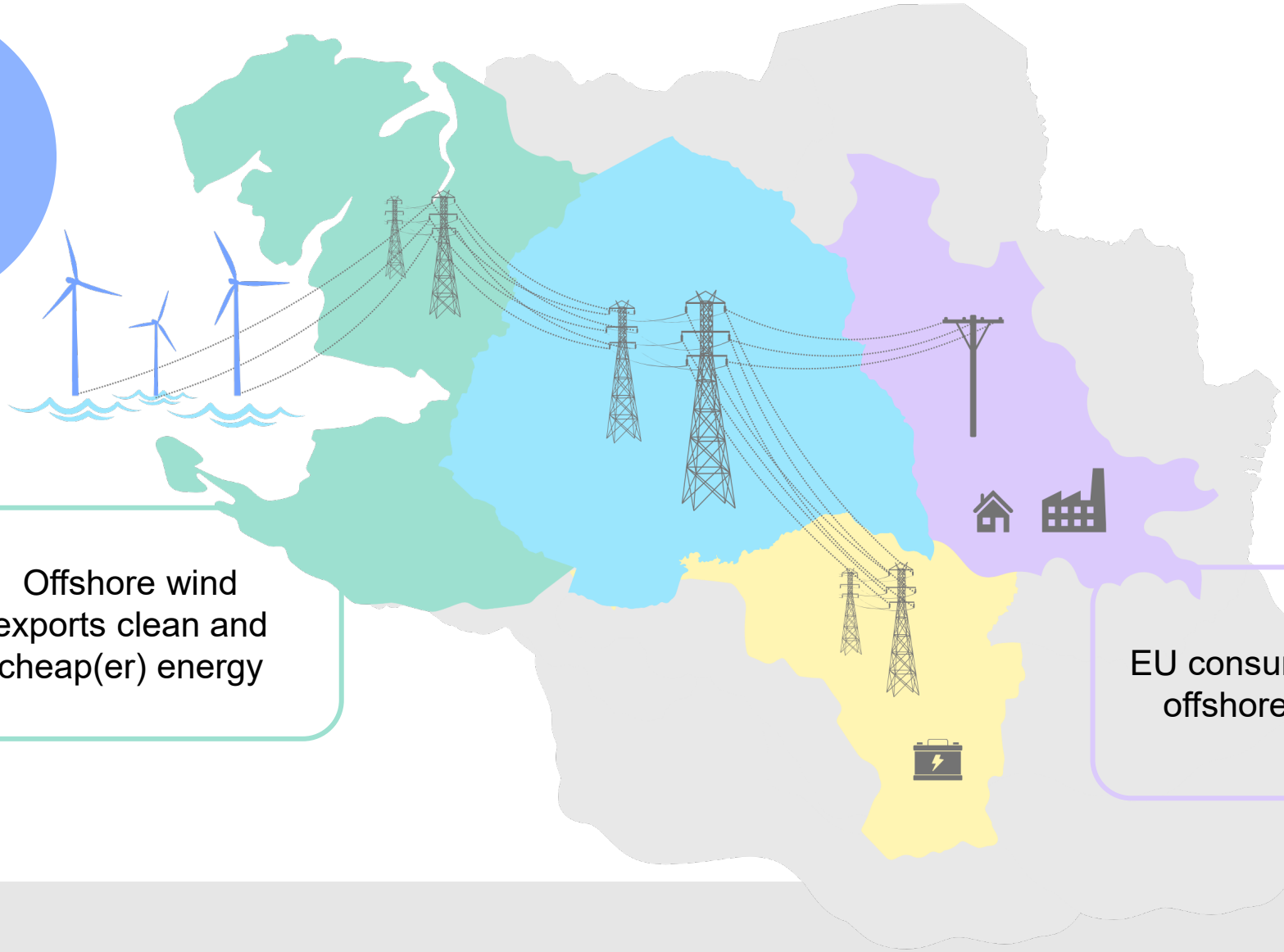
Leveraging energy resource endowments across the EU

From
15 GW today
to 300 GW
by 2050



Offshore wind exports clean and cheap(er) energy

EU consumers access offshore electricity

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Infrastructure - a double challenge

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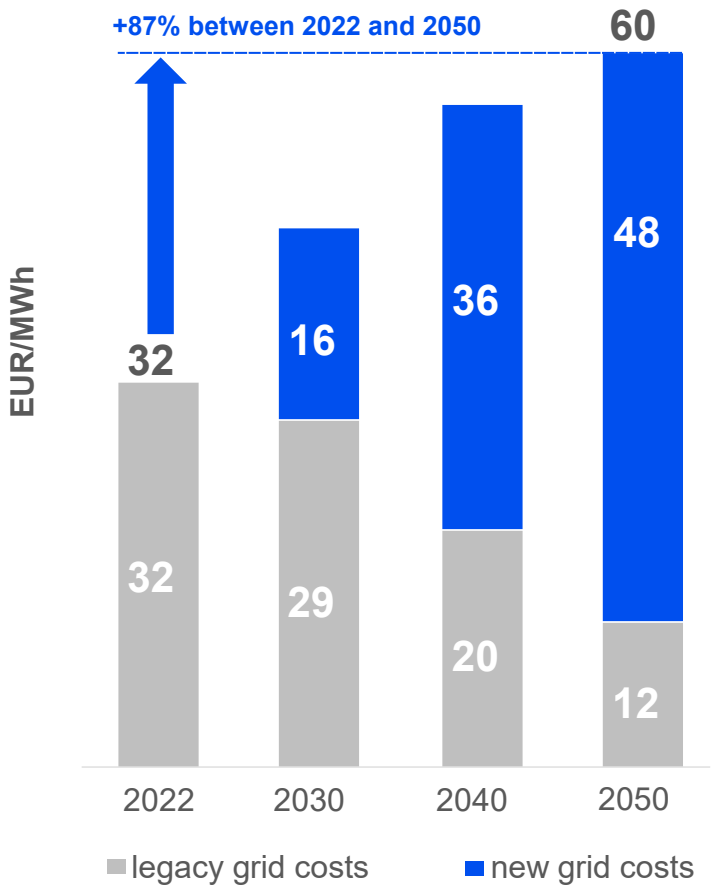
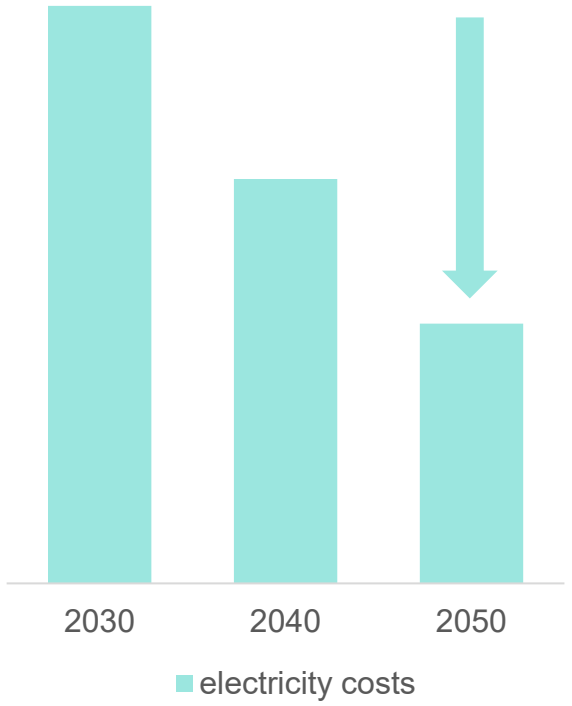
Network costs at risk of doubling by 2050

Grid costs are expected to increase …



… while electricity costs should decrease



>3x

More expensive to connect to distribution than transmission grid

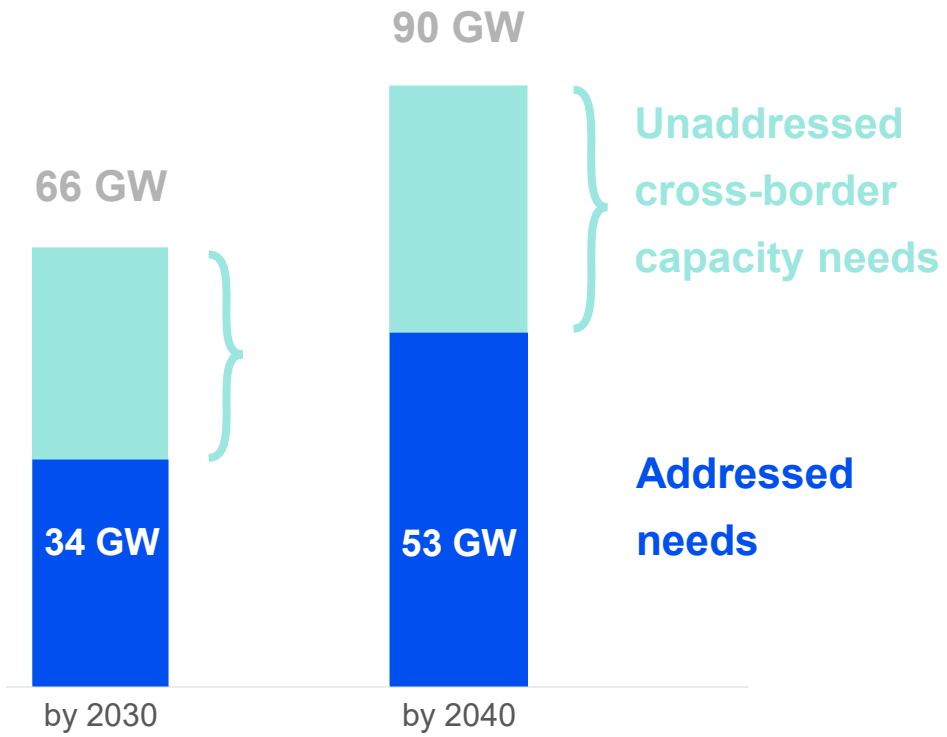
Source: ACER's monitoring of electricity infrastructure development to support a competitive and sustainable energy system, 16 December 2024.

Significant cross-border needs remain unaddressed

Approx. half of the cross-border needs identified via network planning instruments seem not to be addressed by current grid projects.

This means the potential benefits of this cross-border build-out, if left unaddressed, will remain ‘on paper’.

There are more cross-border needs than planned cross-border investments



Source: ACER’s monitoring of electricity infrastructure development to support a competitive and sustainable energy system, 16 December 2024.

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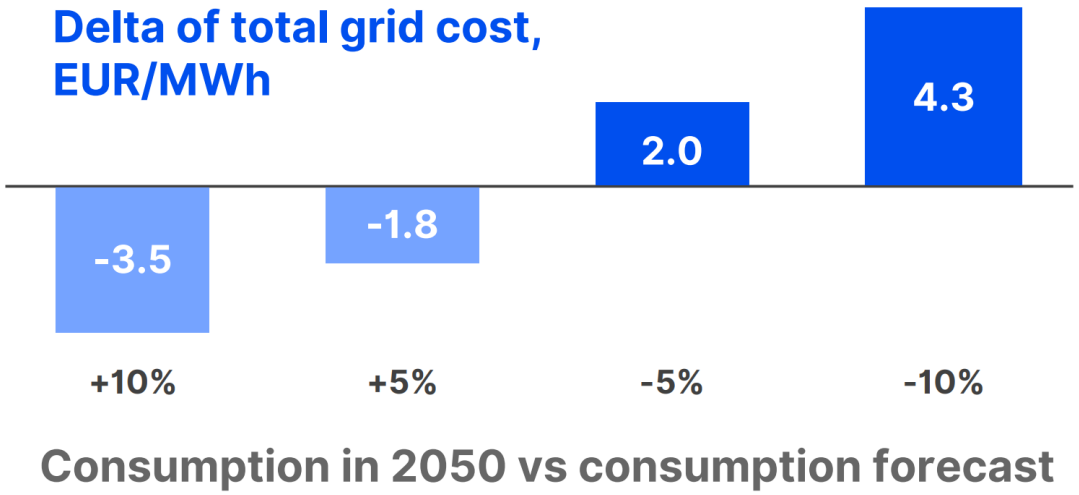
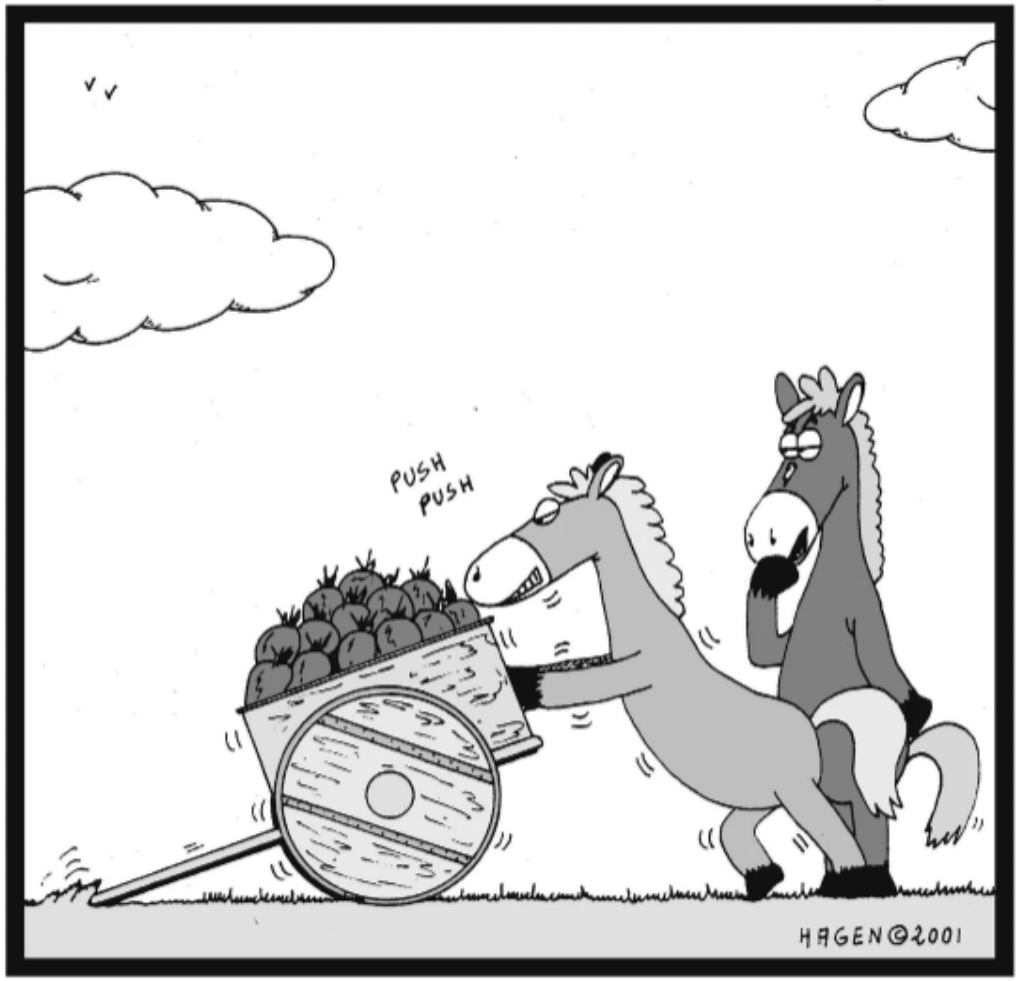
Anticipated demand drives network build-out, right?

Unrealistic forecasts of future consumption may raise costs for actual consumers and give rise to potential sunk costs





Source: ACER's monitoring of electricity infrastructure development to support a competitive and sustainable energy system, 16 December 2024.

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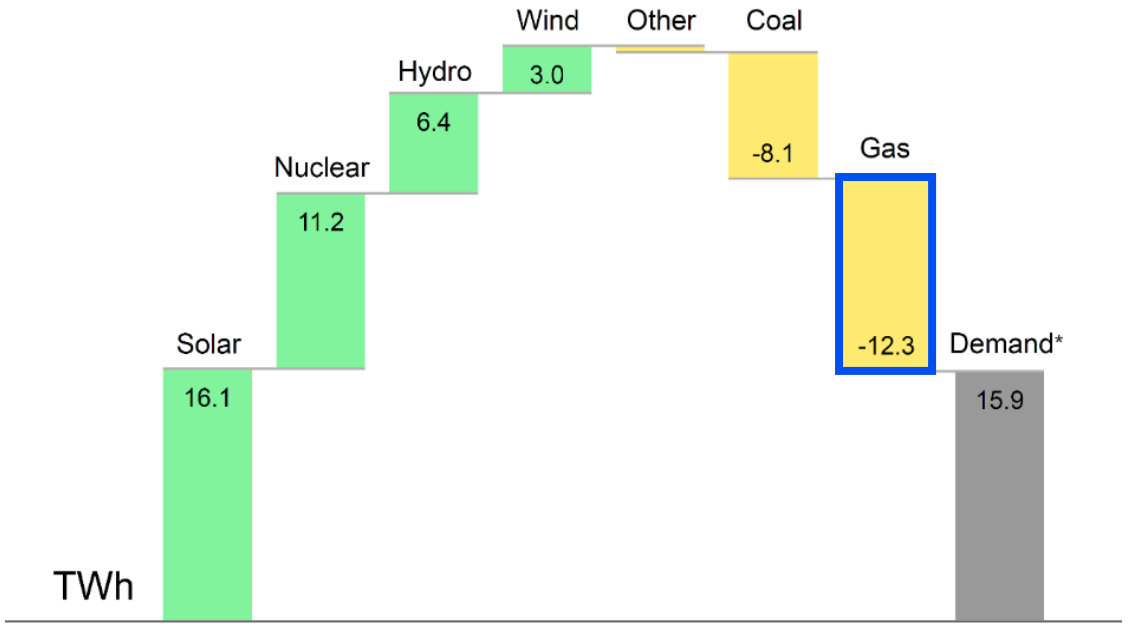
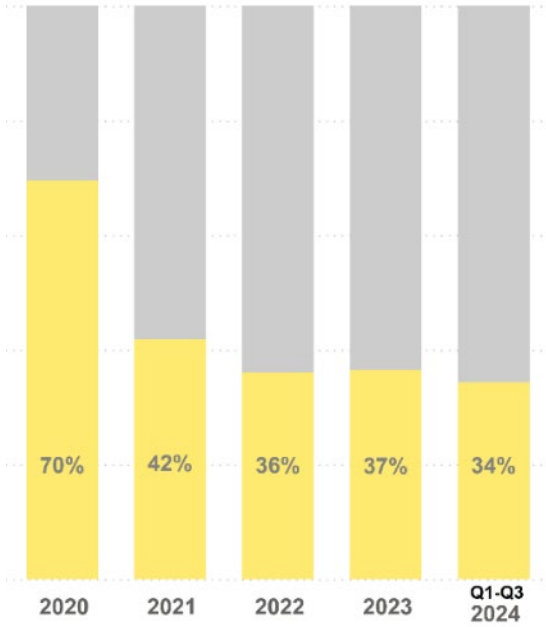
Integrated planning? Yes, but ‘easier said than done’

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.

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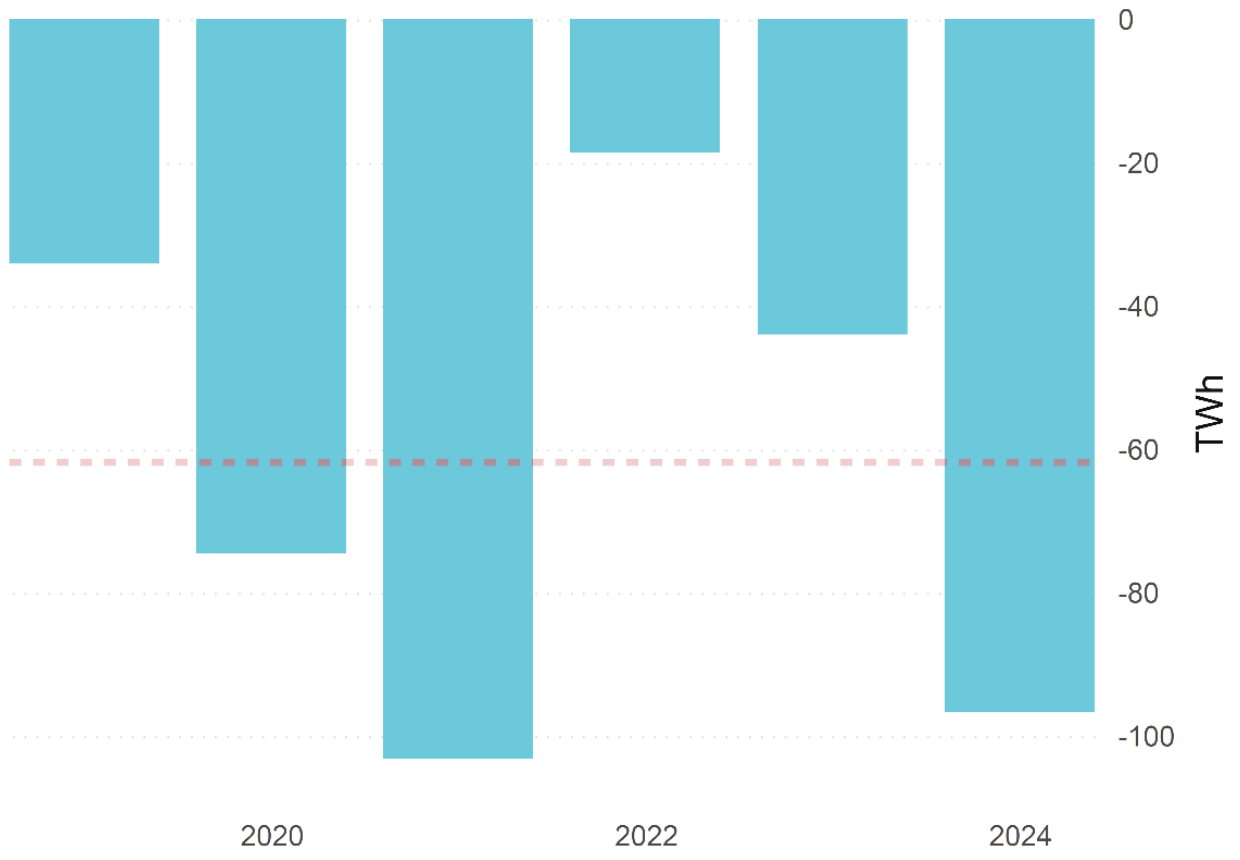
So, less relevance of gas? Well, it depends …

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



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

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Security of electricity supply – upsides & downsides

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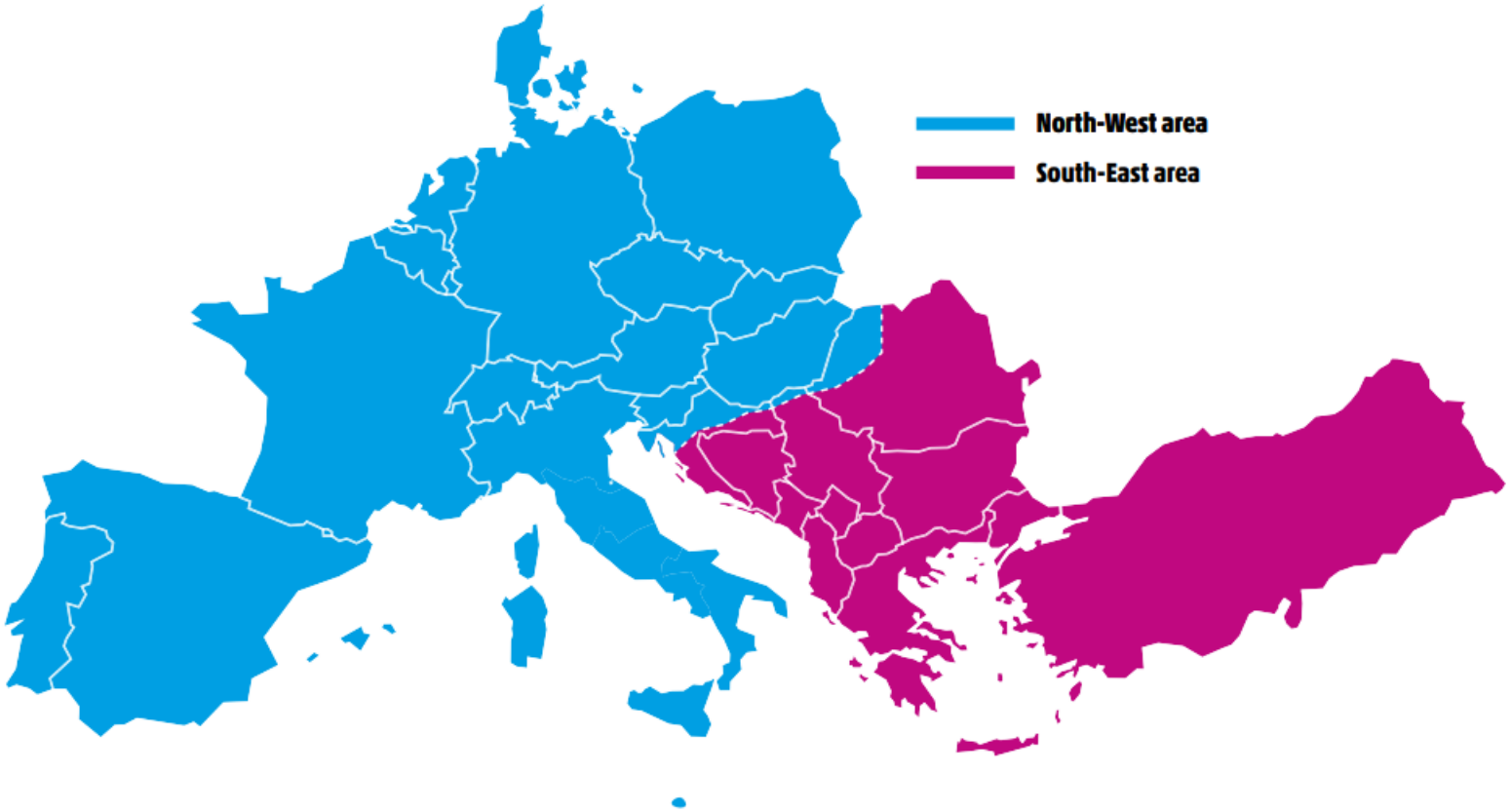
Tackling security of supply together

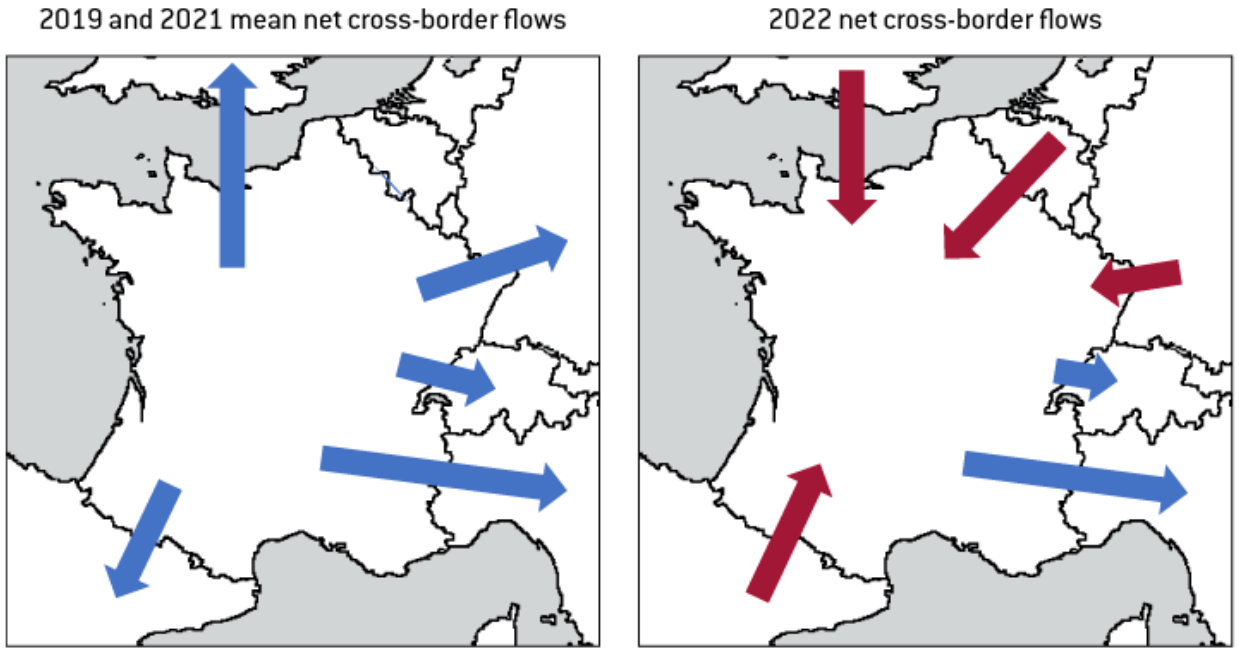
In 2021, a major operational incident split Continental Europe into two parts



Source: ENTSO-E's report of the Continental Europe Synchronous Area Separation on 8 January 2021, 15 July 2021.

Tackling security of supply together

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.

Source: 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, February 2024

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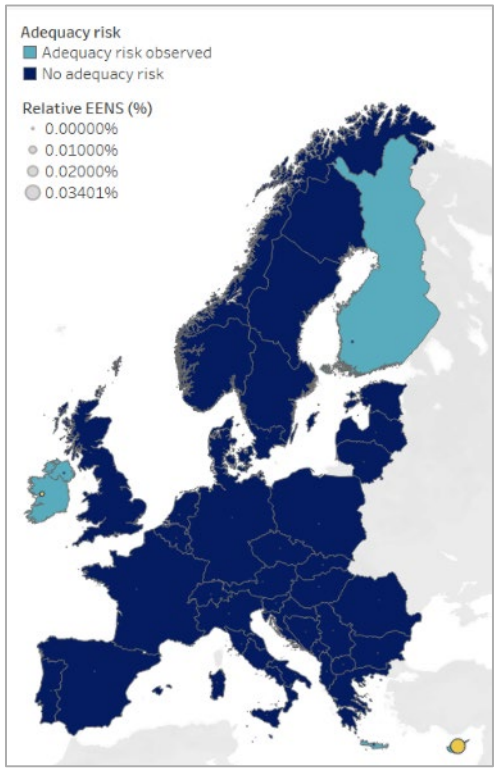
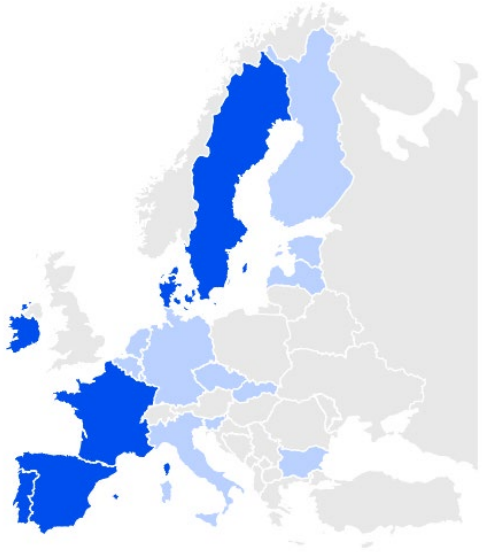
Is security of supply worsening?

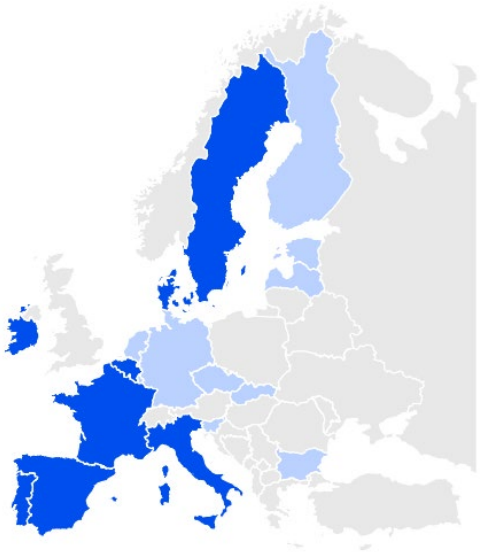
This Winter



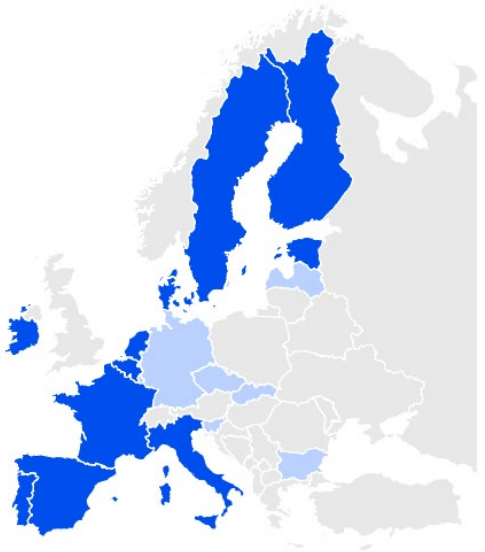
Short-term



Mid-term



Long-term



Adequacy concern identified No adequacy concern identified

Source: Left: ENTSO-E's Winter Outlook 2024-2025. Right: ACER's monitoring of security of EU electricity supply, 16 December 2024.
Note: The figure shows whether adequacy concerns have been identified in the central reference scenario of the most recent NRAA, as reported by the NRAs.

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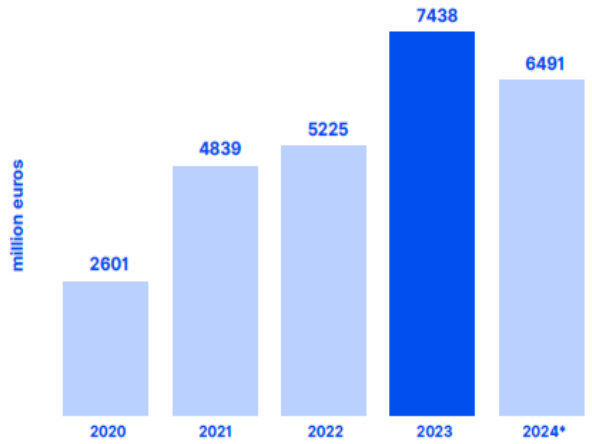
Costs of capacity mechanisms are significant

Costs of capacity mechanisms are on the rise, likely a sign-of-things-to-come



Source: ACER calculations based on data provided by NRAs.

Note: Costs for 2024 are projections. The figure includes the costs of legacy contracts in Spain and Portugal.

Source: ACER's monitoring of security of EU electricity supply, 16 December 2024.

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Costs of capacity mechanisms are significant

and possibly flexibility

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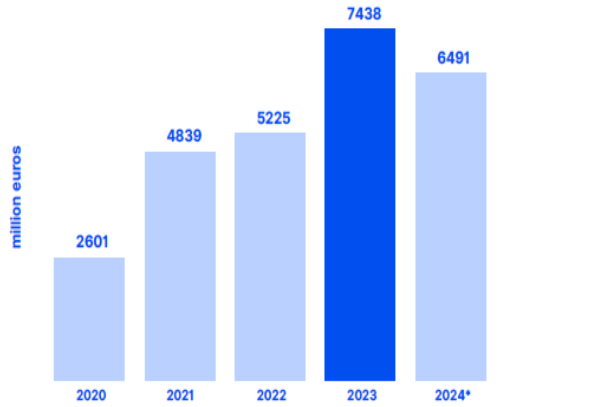
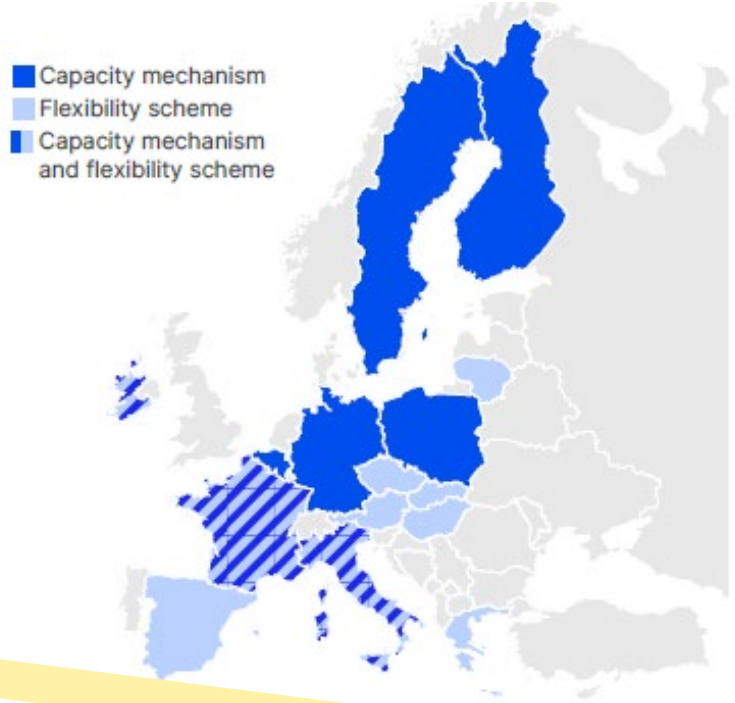


Source: ACER calculations based on data provided by NRAs.

Note: Costs for 2024 are projections. The figure includes the costs of legacy contracts in Spain and Portugal.

Might greater 'resource sharing' mitigate the rise in costs?

A wave of flexibility support schemes may come on top



Source: ACER's monitoring of security of EU electricity supply, 16 December 2024.

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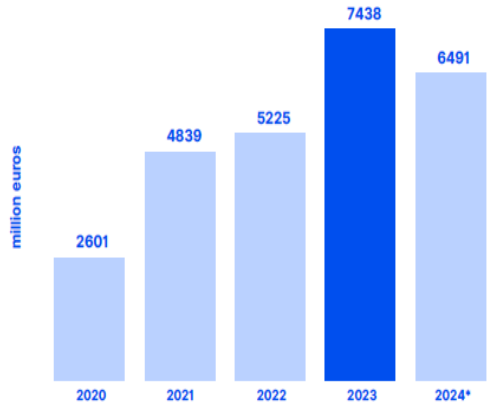
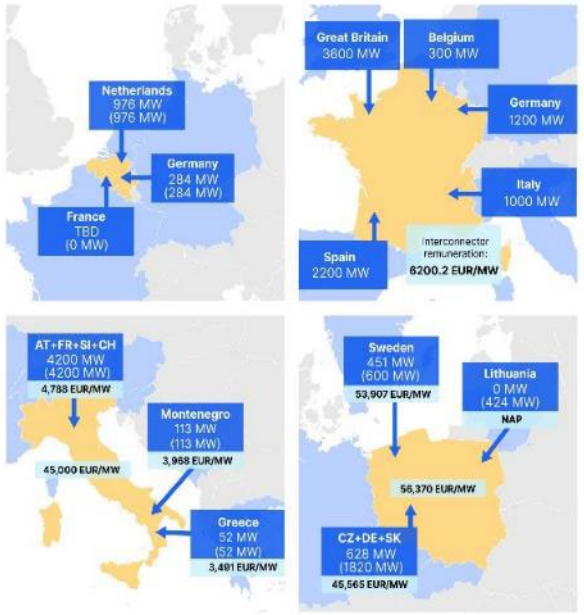


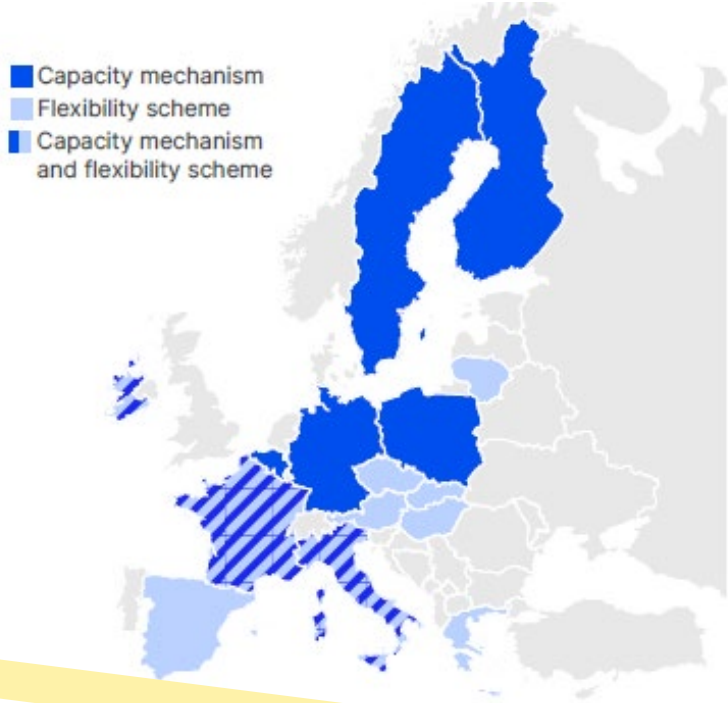
Source: ACER calculations based on data provided by NRAs.

Note: Costs for 2024 are projections. The figure includes the costs of legacy contracts in Spain and Portugal.

Cross-border participation in capacity mechanisms



A wave of flexibility support schemes may come on top



Source: ACER's monitoring of security of EU electricity supply, 16 December 2024.

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Risk of domino effect of (even more) subsidies needed?

85% of long-term contracts

Through capacity mechanisms directed to fossil-fuel generators in 2035

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Case in point? – price volatility in Central & Eastern Europe

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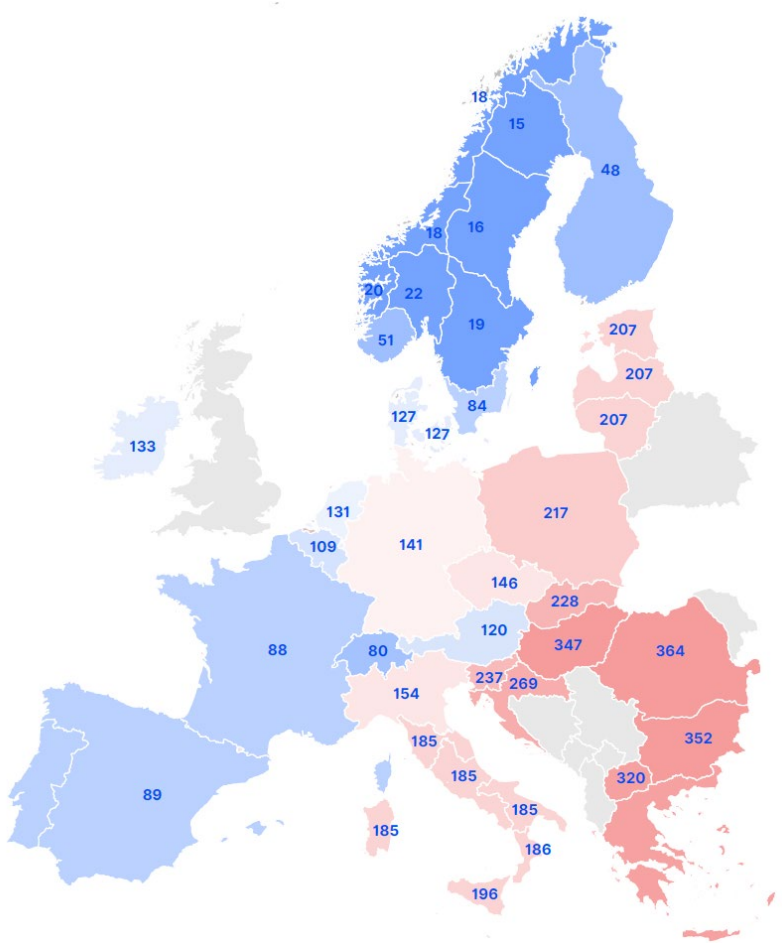
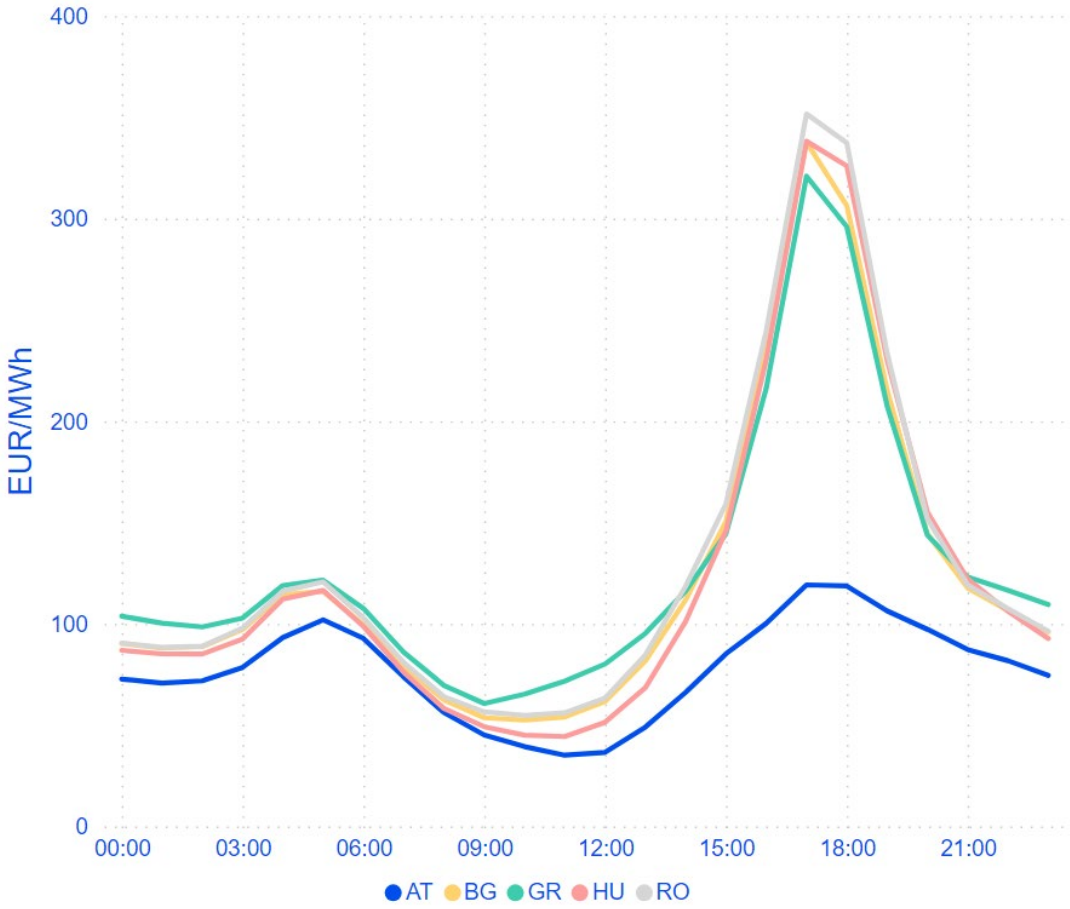
Zooming in on ‘summer developments’

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.

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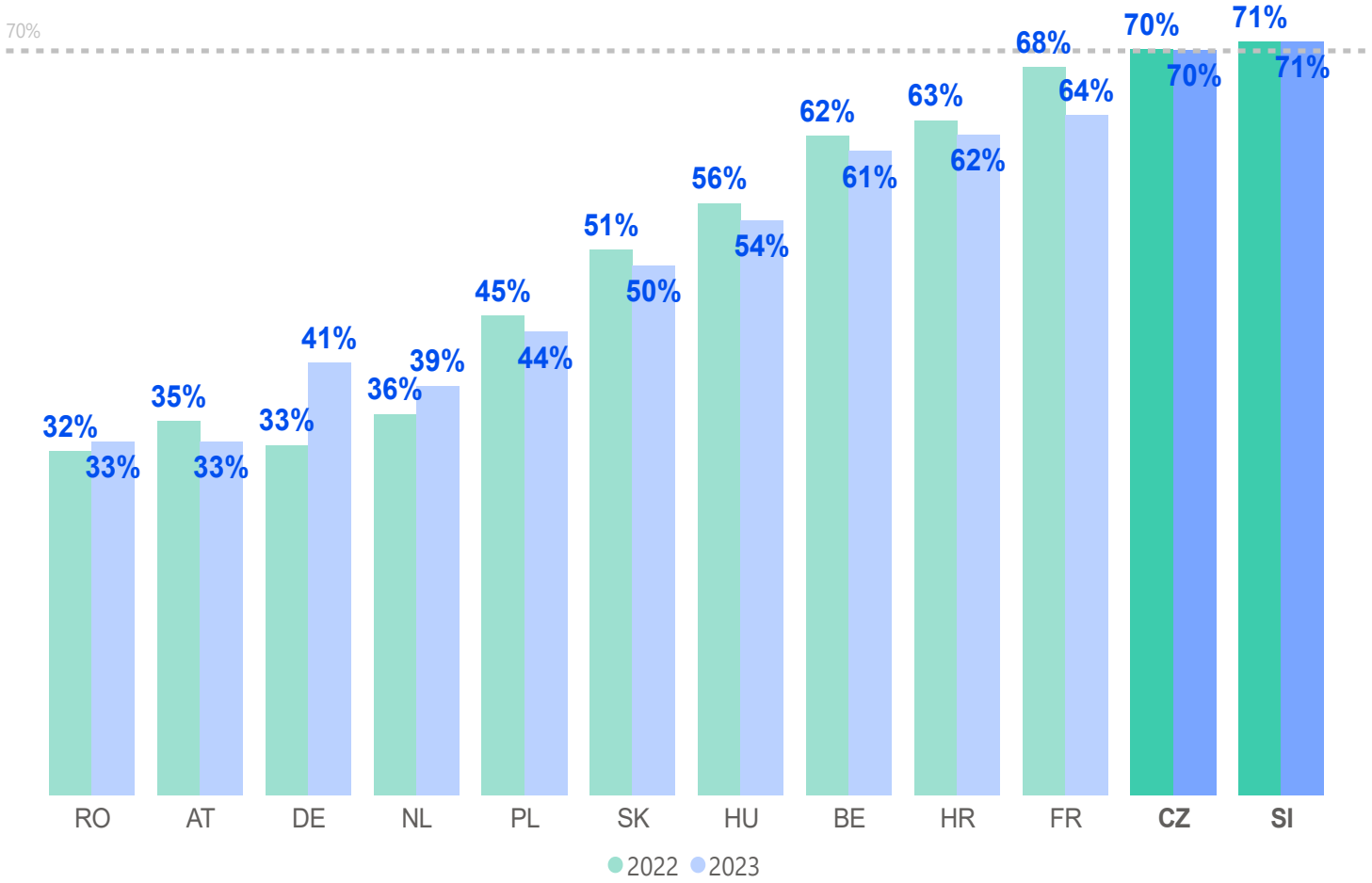
More interconnector capacity needs to be made available

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)



*"ACER estimates that, during the summer of 2024, meeting the 70% requirement would have yielded **between 10 and 25% of additional margin of capacity** in the most relevant bottlenecks [affecting Central Eastern Europe]."*

Source: ACER's report on capacities for cross-zonal trade of electricity and congestion management, July 2024. ACER Opinion issued on 10 April 2024. Background note for TTE Council of 16 December 2024.

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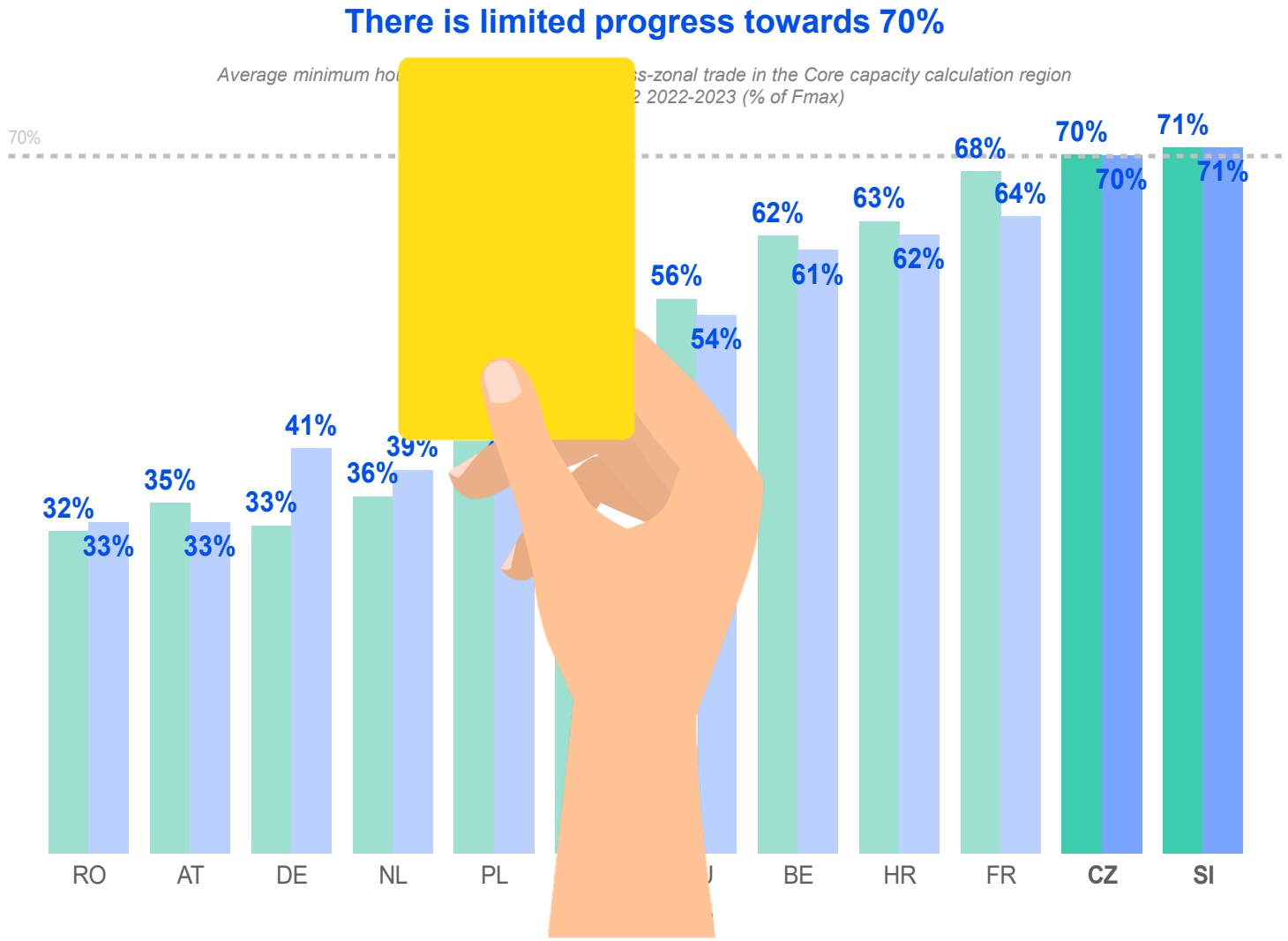

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A greater role for demand response & storage

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

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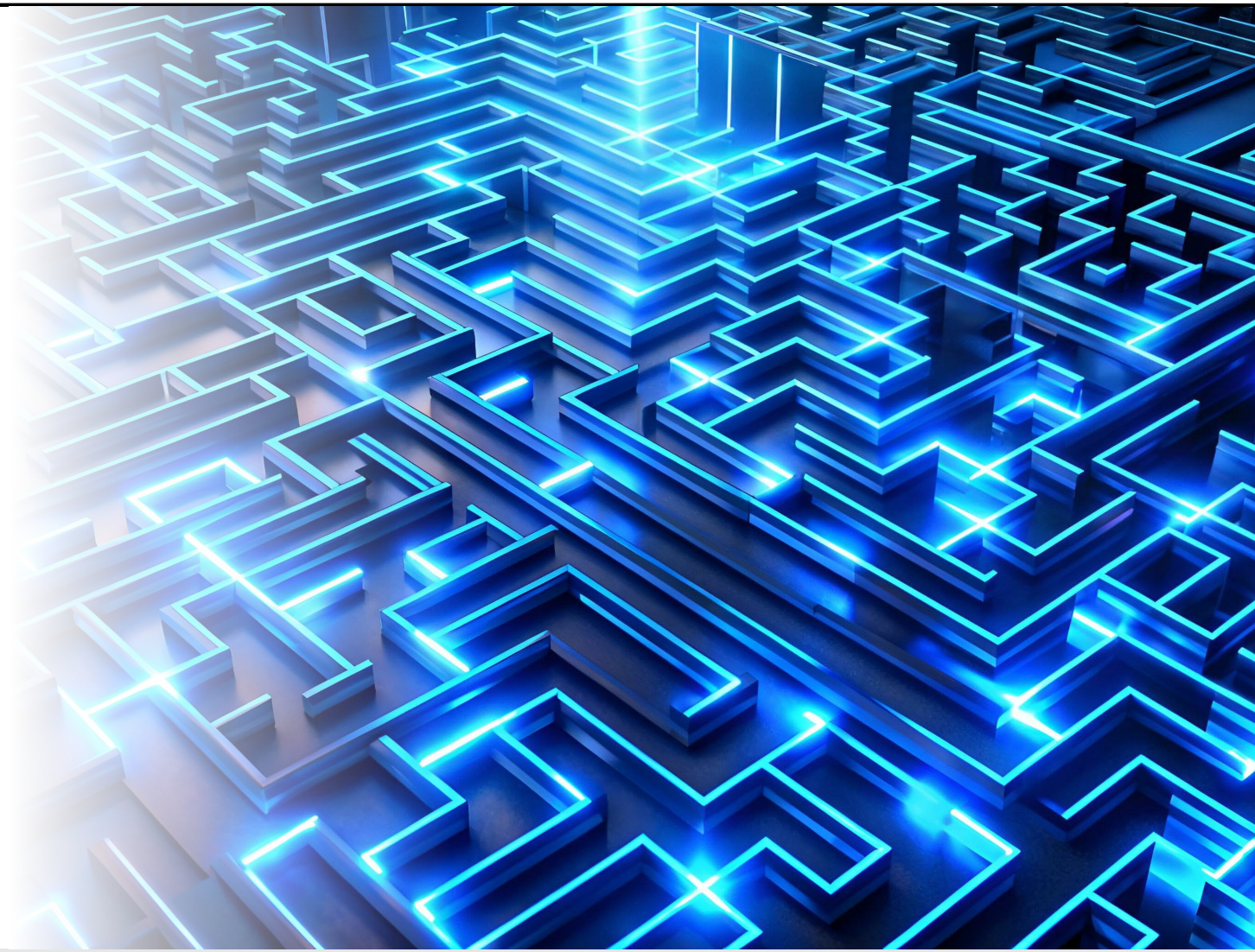
Market concentration vs. ‘fishiness’: Oversight matters

ACER and national regulators scrutinise markets for potential abuse

- Insider trading
- Price manipulation
- Deception, misleading behaviour or information

Market concentration ≠ market manipulation



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Conclusion

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The road ahead: Smooth, winding or bumpy?

Many interdependencies in the energy transition (e.g. pace of electrification, flexibility, renewables rollout, grids) suggest that price volatility will likely be a recurrent feature.

How to moderate this volatility?

- Greater uptake of (low-carbon) flexibility
- Active monitoring in order for decision-makers to better '*ANM*' the journey (*anticipate, navigate, mitigate*)

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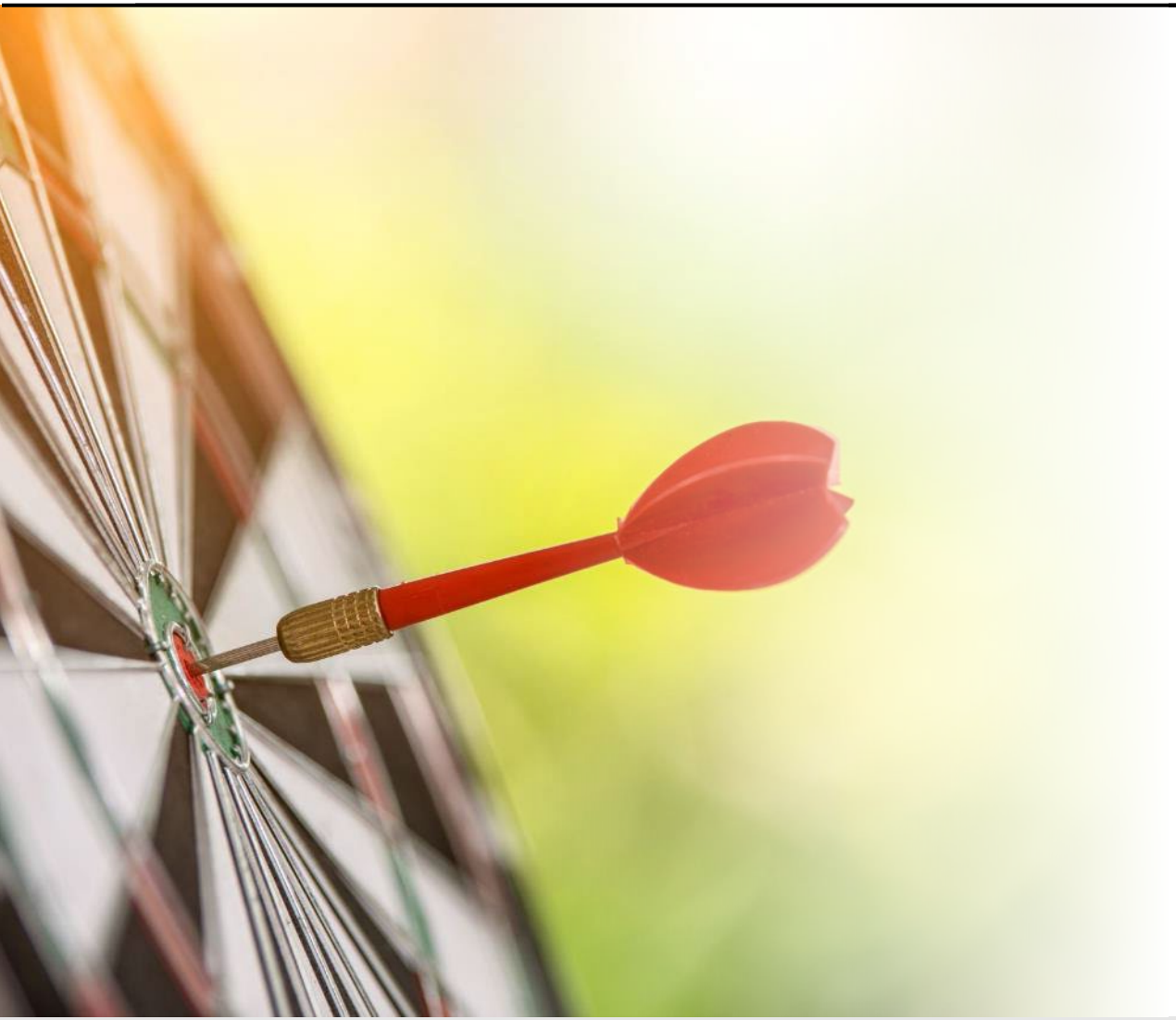
‘Doing more together’ invariably links to ‘trust’



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?

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So, might it be time to renew (or revisit) those initial vows?

- Taking a fresh look at future cost drivers
- Consider ‘doing more together’ on infrastructure and security of supply
- Flexibility becomes an imperative to moderate price volatility
- A relationship test ahead: Key policy choices for the Energy Union

Thank you.
Any questions?

The contents of this document do not necessarily reflect the position or opinion of the Agency.

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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**.