Tackling Interconnection

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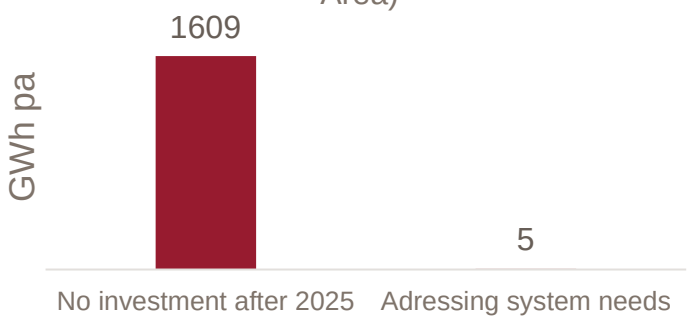
Why new electricity interconnectors are important – Europe has ambitious plans to transition to Net Zero by 2050 ...

Security of Supply

Cross-border interconnection resulting in less gas-fired generation, and less Energy-not-served

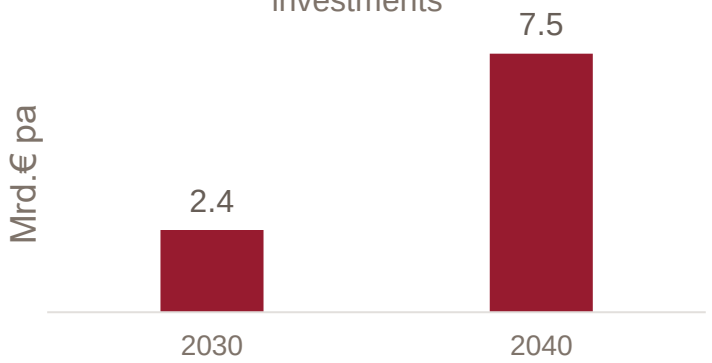
Energy not-served in 2040 (ENTSO-E Area)



Affordability

European integration due to network investments reducing generation costs

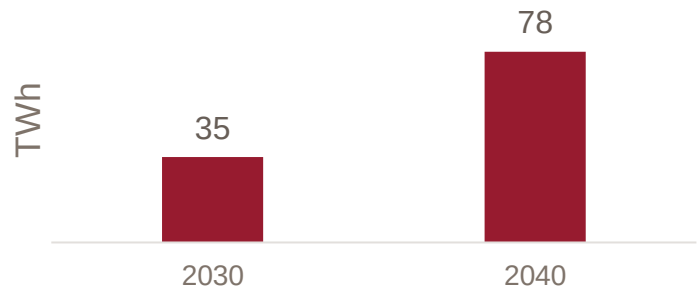
Generation cost savings from network investments



Decarbonisation

Physically integrated markets allow better integration of cross-border RES generation

Curtailed Energy – no network investment after 2025 (ENTSOe Area)



... with an even more rapid decarbonisation of the electricity sector

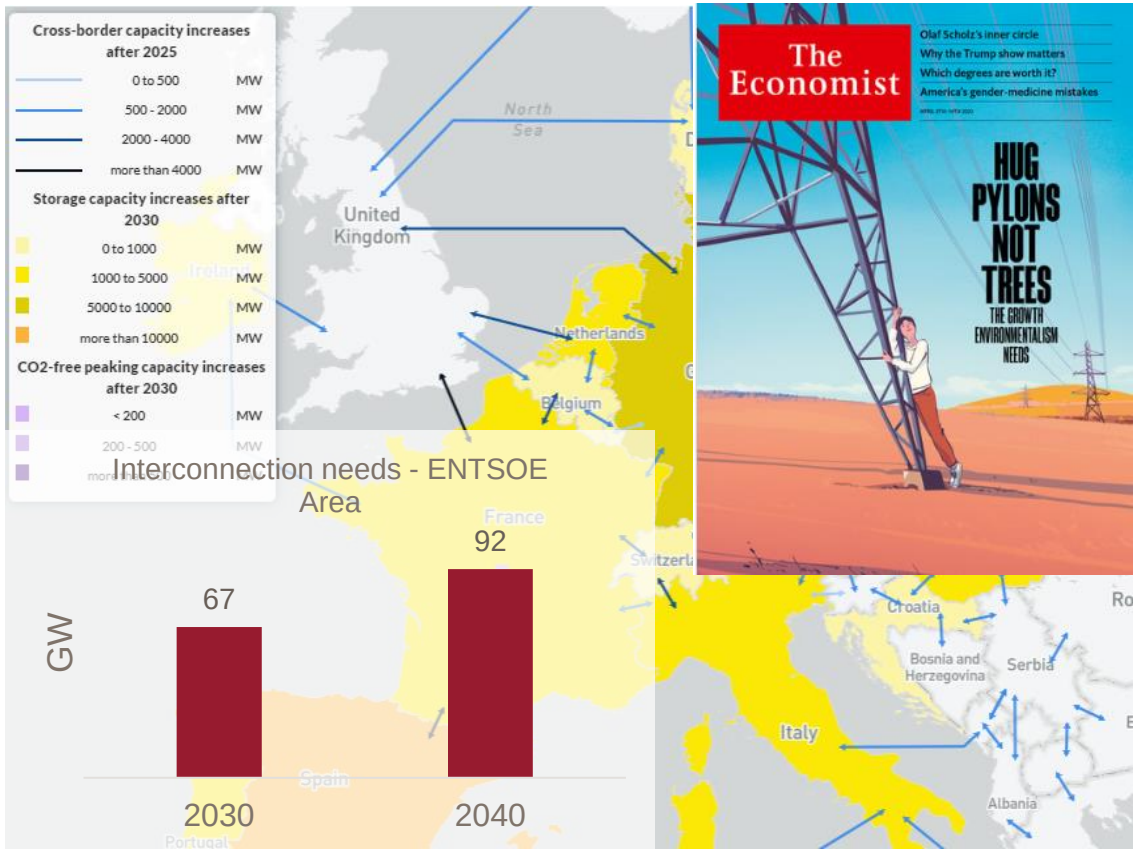
Source: ENTSOE, System needs report, 2023

“Tackling Interconnection” needs to include more than only cross-border electricity interconnectors to make our journey to Net Zero 2050 a success

1. It is about tackling **Critical Network Elements within and between countries** and not only Interconnectors
2. It is about the **optimal utilisation of the existing electricity transmission network**
3. It is about **interconnecting different energy sectors** for the efficient utilisation of all energy networks
4. It is about **cross-border cost allocation between countries** for investments covering different energy sectors

… we will need all energy networks and coordination between them.

1 Investment needs in electricity transmission interconnectors are substantial and meeting cross-border needs will require the reinforcement of national networks ...



Source: ENTSOE, System needs report, 2023

It is about Critical Network Elements within and between countries and not only Interconnectors

- Cross-border trade can be limited due to congested Critical Network Elements within a country.
- We need to tackle **"Critical Network Elements" between and within countries**
- European regulation already provides incentive instruments for network expansion (e.g. Congestion rents, redispatch/ countertrading cross-border cost sharing, PCI/CBCA)
- ... and the **new EU COM Electricity Market Design** adds new ones (e.g. include "anticipatory transmission investments" national regulatory regimes)
- However, **important barriers for network expansion** is still waiting to be resolved:
  - **Streamlining approval process involvement**
  - **Raising equity and state ownership**

... public resistance is still an important barrier for expansion.

2 Electricity transmission capacity is a scare resource which needs to be used in an optimal way for cross-border trade along short- and long-term markets

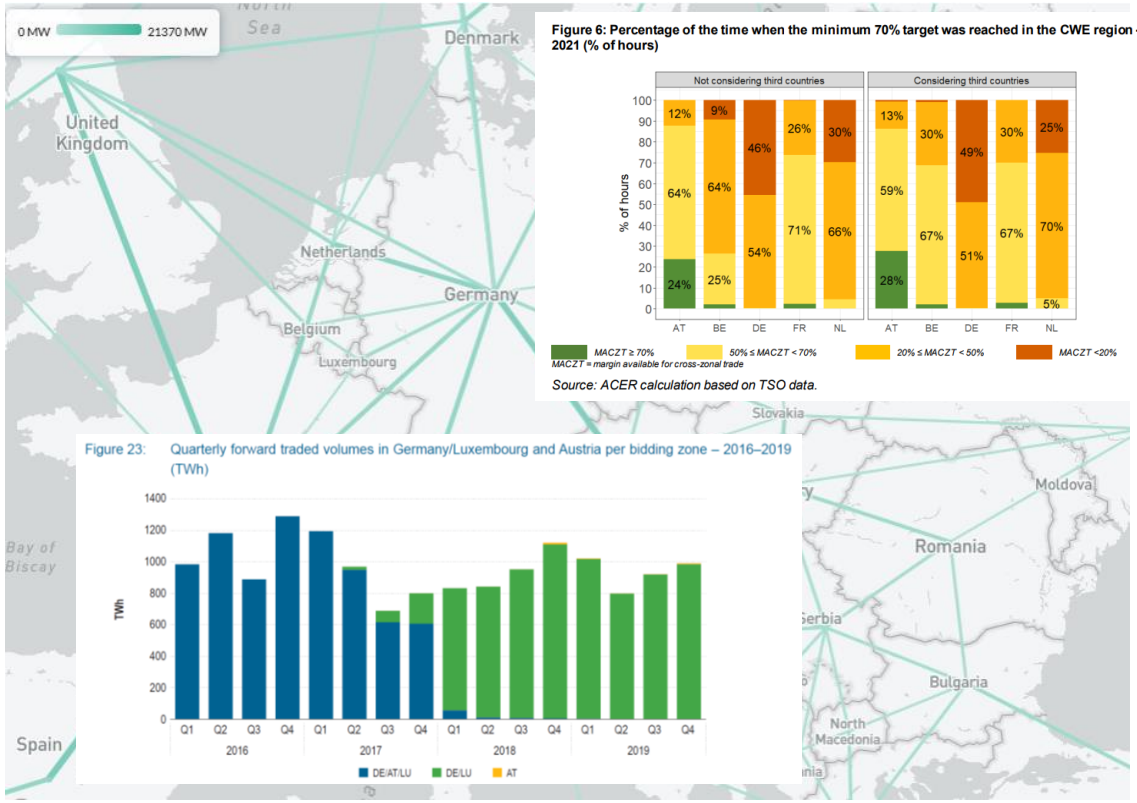


Figure 6: Percentage of the time when the minimum 70% target was reached in the CWE region – 2021 (% of hours)

Source: ACER calculation based on TSO data.

Figure 23: Quarterly forward traded volumes in Germany/Luxembourg and Austria per bidding zone – 2016–2019 (TWh)

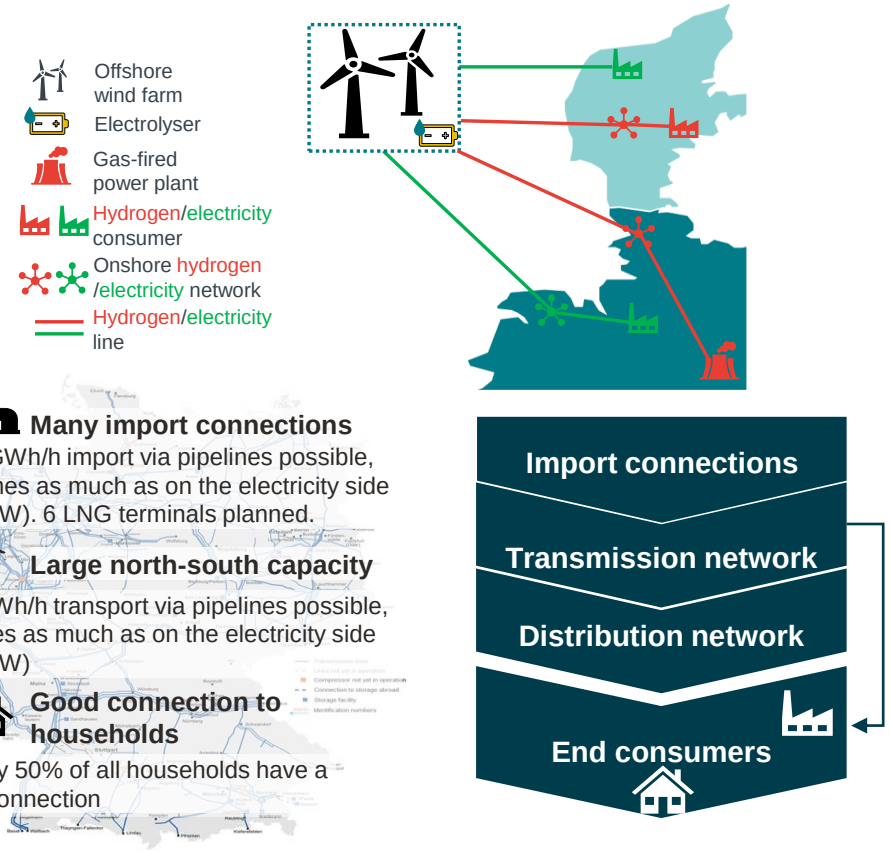
Source: ENTSOE, System needs report, 2023; ACER

It is about the optimal utilisation of the existing transmission network

- European regulation already has instruments for better utilisation of existing grid (e.g. Flow-based-market coupling; 70% rule?)
- ... and the **new EU COM Electricity Market Design adds further instruments**:
  - Measures for increasing cross-zonal intraday liquidity
  - Long-term transmission right ranging from month ahead to three years ahead
  - Regional virtual hubs to pool liquidity and new financial transmission right product
- Regional virtual hubs may be seen as **anticipatory mitigation measure for future smaller bidding zones**.
- However, **policymakers** still need to balance the **positive effect from better utilisation** of the existing grid and the **negative impacts on market risk and investment incentives** from smaller bidding zones

... taking into account the trade-off between technical and commercial requirements.

3 Net Zero by 2050 changes the “energy world” which becomes sector-coupled. Hence, besides the electricity network other energy networks can serve as interconnectors …



Source: Frontier Economics

It is about interconnecting different energy sectors for the efficient utilisation of all energy networks

- The path to Net Zero results in **complex multi-purpose solutions involving different energy carriers**
- The **new EU COM Electricity Market Design** recognises multi-purpose solutions in relation to **hybrid interconnectors**. Congestion rents shall be used to compensate offshore wind investors in an offshore bidding zone for curtailed electricity
- However, **multi-purpose solutions can include more**:
  - H2 line
  - Gas line
  - Electricity line
  - Electrolyser
- Interconnection between **EU regulation on electricity, gas and hydrogen** can add further value from a whole-system approach perspective and the Gas/H2 package includes some first steps into this direction

… for different energy sectors between or within countries.

4 The sector coupled "energy world" requires new ways for cross-border cost allocation ("CBCA") between countries…

	Country A elec	Country A H2	Sum A	Country B elec	Country B H2	Sum B	EU
Cost	50	0	50	10	40	50	100
Benefit	40	40	80	10	30	40	120
Net impact			30			-10	20
Costs after reallocation			67			33	100
Net impact after CBCA reallocation			**13**			**7**	**20**

Stakeholders potentially included in burden sharing (at MS level)

Consumers	H2	Electricity
Producers	H2	Electricity
Network (users)	H2	Electricity
State	General tax payer	

It is about cross-border cost allocation between countries for investments covering different energy sectors

- CBCA for **multi-purpose solutions involving different energy carriers** can be based on
  - **Sector-specific burden sharing**: the burden sharing for the electricity infrastructure is based on the benefits to the electricity sector, and the burden sharing for H2 infrastructure is based on the benefits to the H2 sector, etc.; or,
  - **Sector-integrated or "bundled" burden sharing**: the burden sharing is based on the combined costs and benefits of the involved sectors
- **Frontier (2022)* recommended**
  - **integrated approach, because in case of a** sector-specific approach the compensation might not always be sufficient.
  - **allocation of costs to Member States**, rather than prescribe exact allocation of costs to specific sectors as part of the CBCA

… taking into account an integrated approach for burden sharing .

*Frontier Economics, Cross-border cost allocations for multi-purpose solutions, Discussion paper prepared for the NSWPH, Dec 2022