# Energy Transition in Germany

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# Energy Transition: Efficiency, Renewables, Sector Coupling

1 Increasing energy efficiency

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2 Increasing renewable capacity

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3 Sector coupling electrification and green hydrogen


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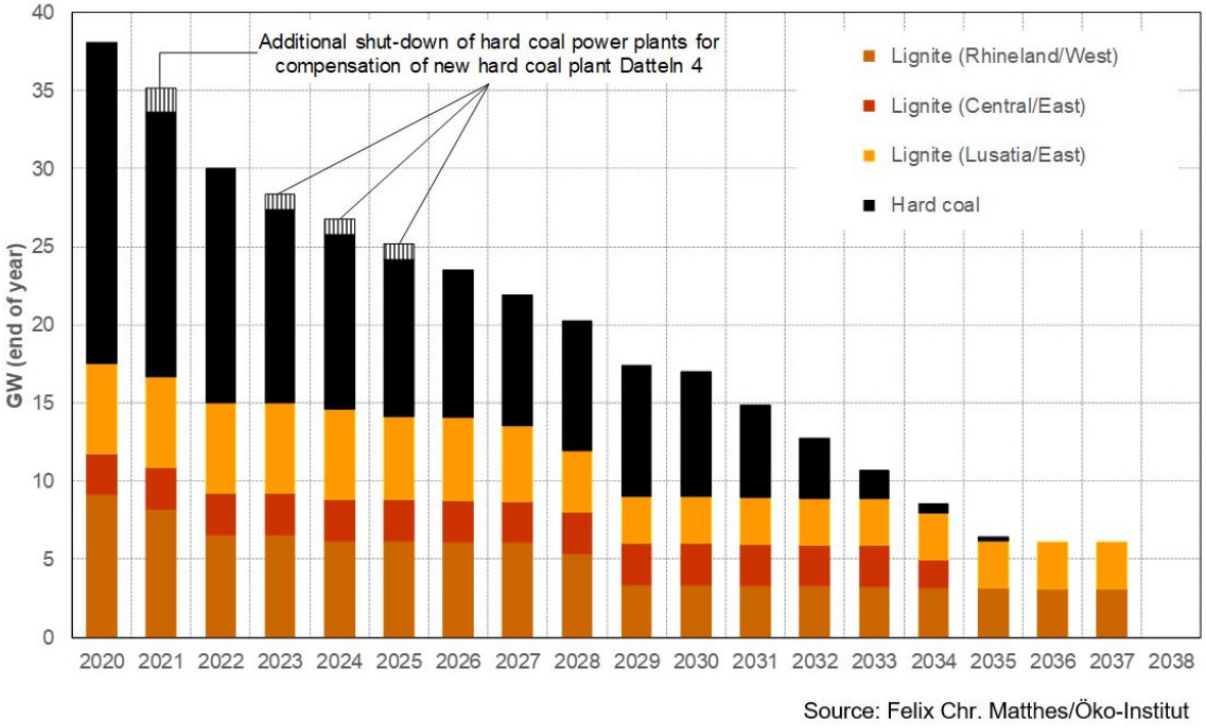
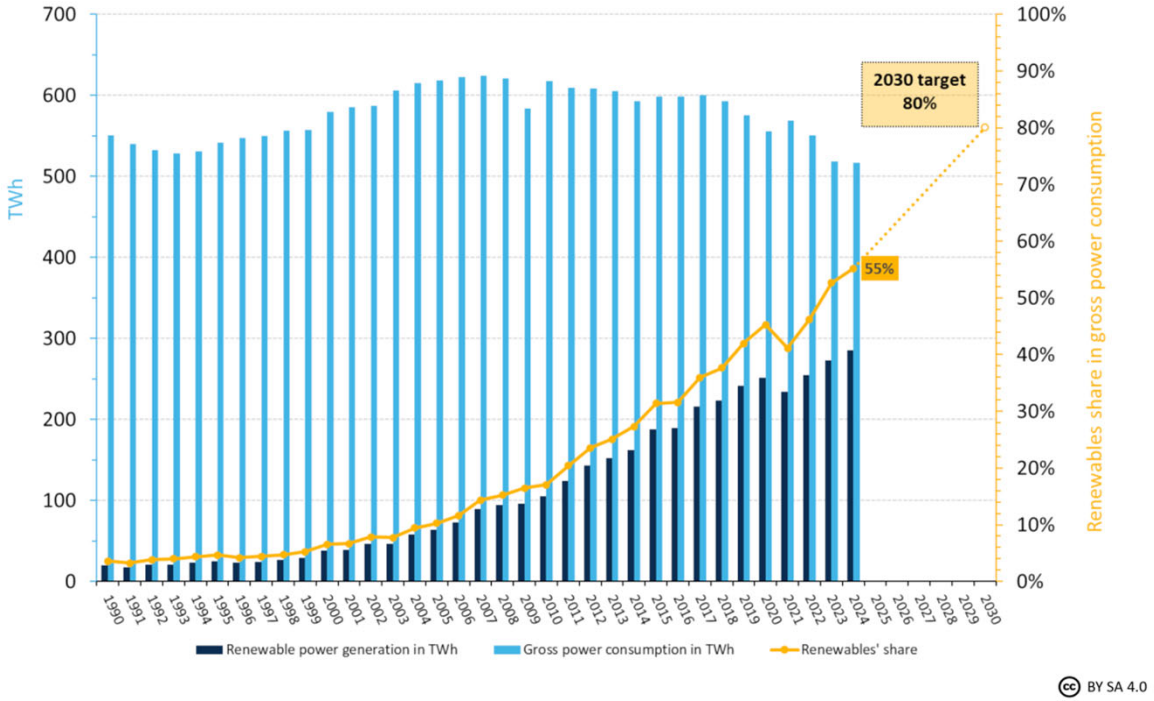
# Phase Out of Coal (and Nuclear)



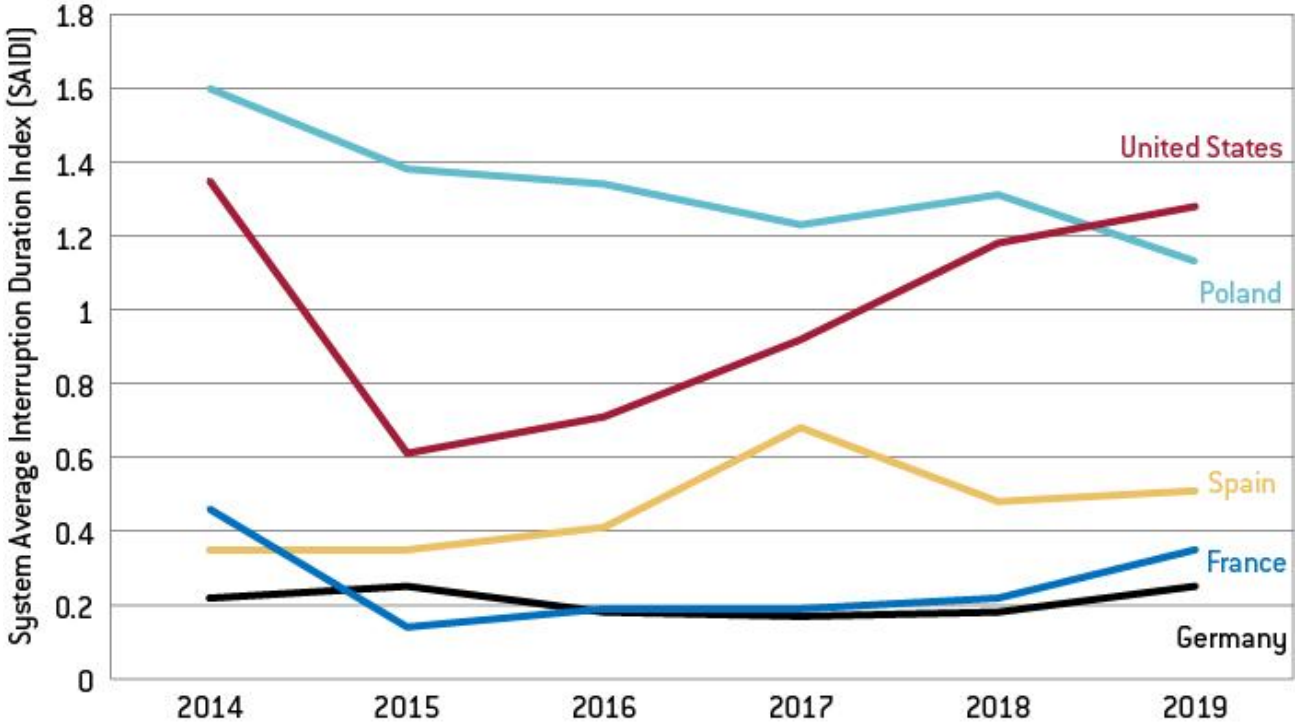

Source: Felix Chr. Matthes/Öko-Institut

# Share of Renewables in Gross Electricity Consumption



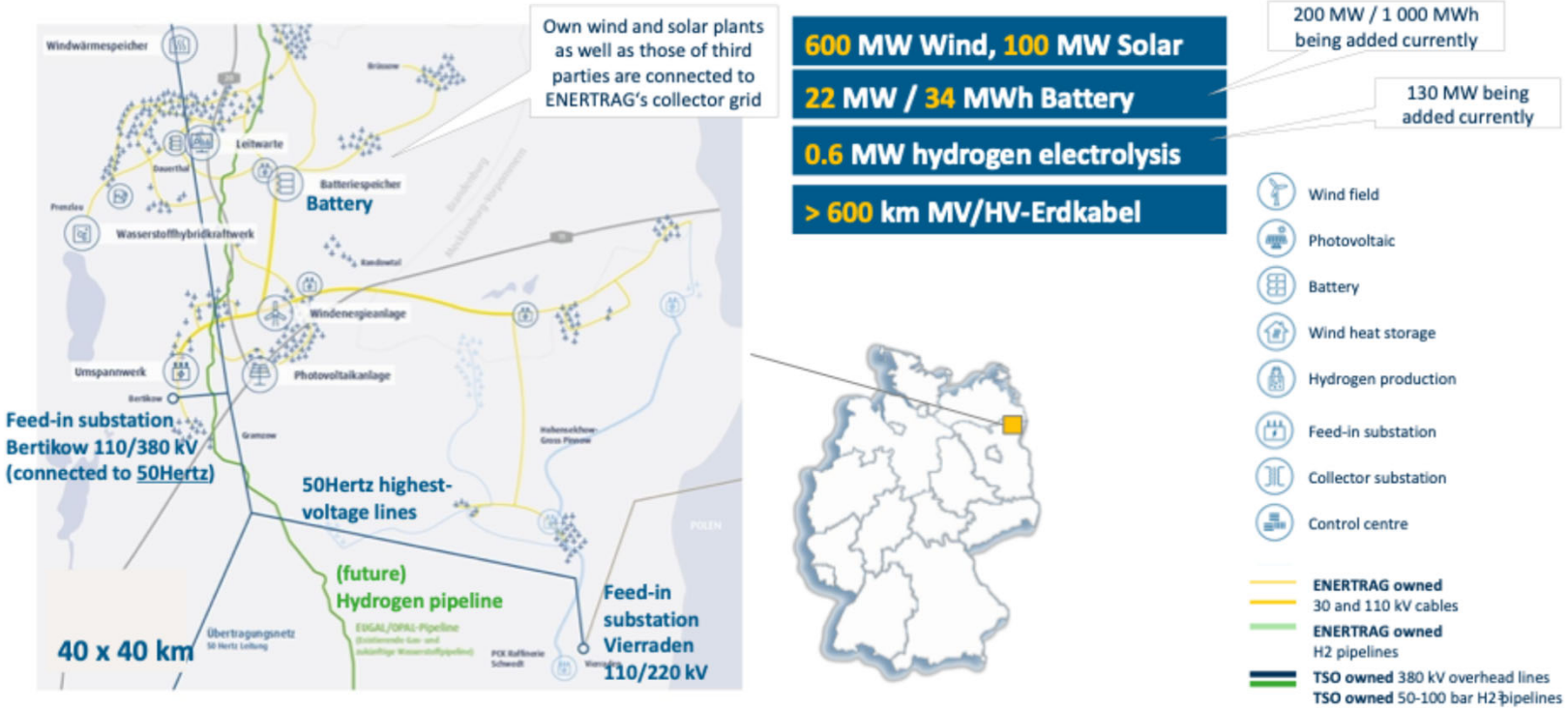

Source: Clean Energy Wire (2025)

# Power Outages/ Year Based on SAIDI Index



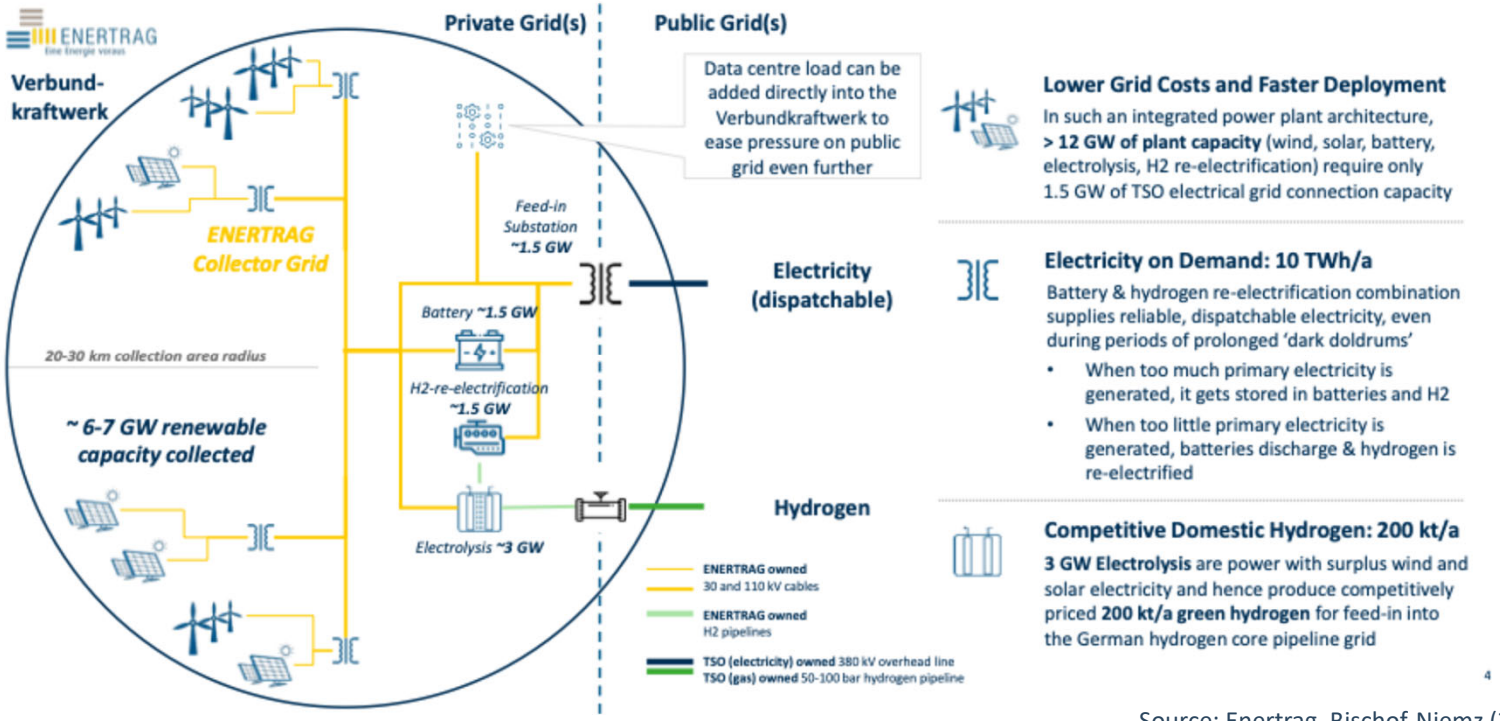

Source: Bruegel based on World Bank. Note: SAIDI is a reliability index measuring the average total duration of outages (in hours) experienced by a consumer in a year. SAIDI of 1 should be interpreted as an average of one hour of electricity outage across an entire year. A lower score indicates greater reliability.

# Micro and Collector Grids for the Transition

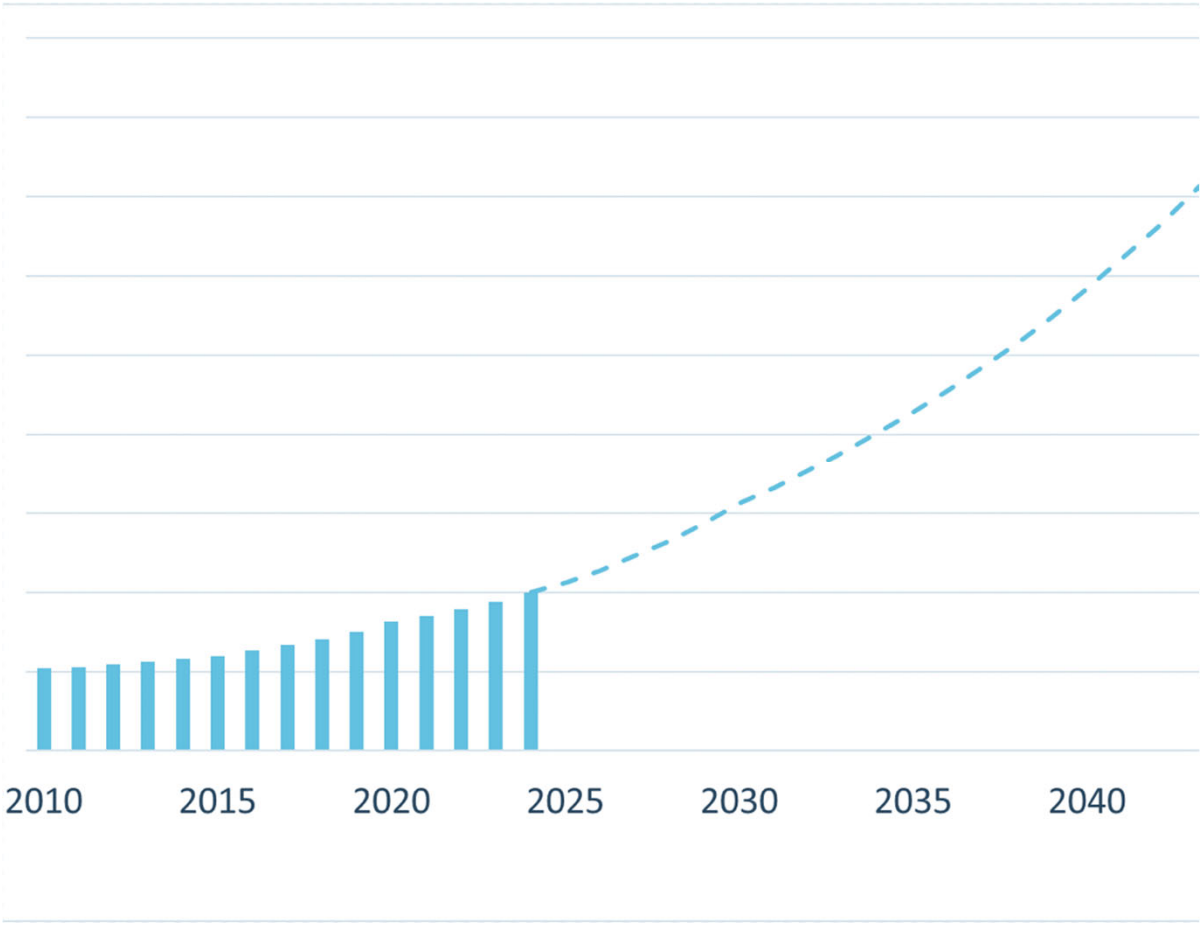



Source: Enertrag, Bischof-Niemz (2025)

# Combined Hydrogen and Electricity Production



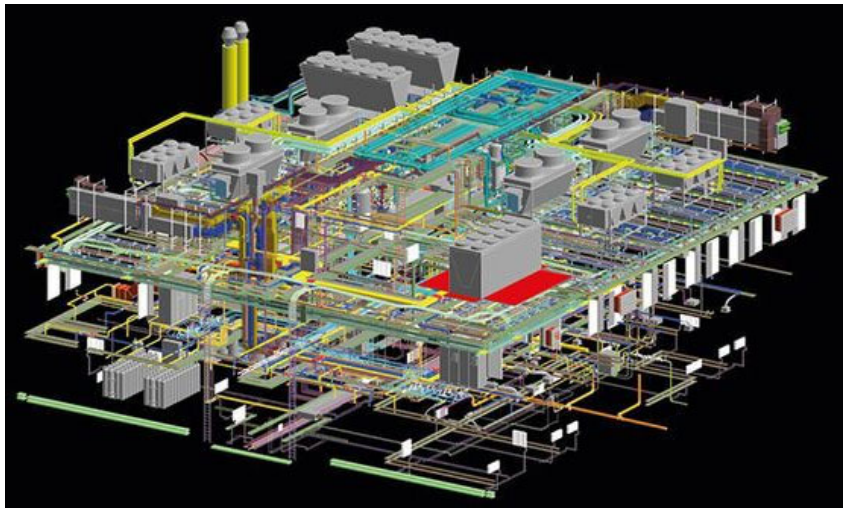

Source: Enertrag, Bischof-Niemz (2025)




# Power Demand of Data Centers in Germany

- Development of the electricity needs of data centers and smaller IT installations in Germany in the years 2010 through 2024, and long-term prediction through 2045
- Demand scenarios indicate a strong increase in energy consumption
- Useable waste heat will increase by 10 TWh until 2045

Source: Borderstep (2024)



Source: IER (2025) www.ier.uni-stuttgart.de/dokumente/nachhaltige_rechenzentren/2020-06_Nachhaltige-Rechenzentren_Leitfaden_BF.pdf

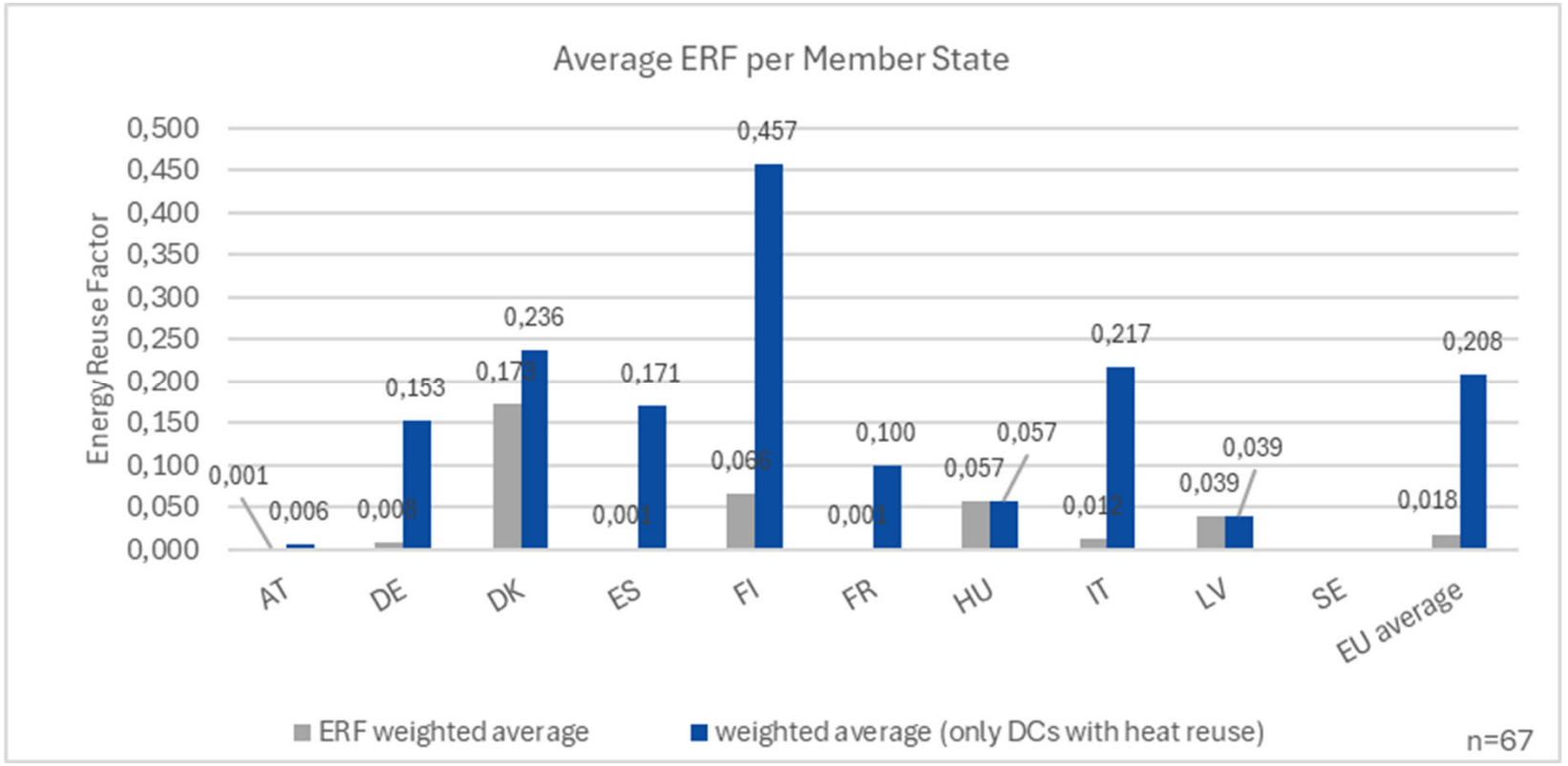
# Grid Integration and Heat Reuse from Data Centers

- Data center boom: rising number of centers, sites, and power
  demand create challenges for grid integration
- Data center compete with compounds of energy transition (large batteries, electrolyzers, industrial sites, etc.)

Nevertheless, data centers can be part of the solution by:

- Sharing connection to the (transmission) grid with other users
- Providing flexibility (e.g., from load management, supply/ backup systems, batteries)
- Onsite power generation

# Potential Waste Heat Utilization EU




Source: Borderstep (2024)

# Thank you!

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