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GERMANY'S RENEWABLE ENERGY TARGETS FOR 2030

IMPACTS OF A POTENTIAL REDUCTION

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BACKGROUND: ARIADNE-SZENARIENREPORT 2025

- **Ariadne-Szenarienreport (March 25)**
  - Climate-neutrality by 2045
  - Focus on cost efficiency & investment needs
  - Identified potential savings for infrastructure projects

- **Discussion: Should RES targets be reduced? (Q4 2025)**
  - **Electricity demand 2030** had been **overestimated** - when deciding on targets as well as in scenarios
  - **Reason:** slow electrification, low industrial activity
  - Monitoringbericht (BET/EWI, September 2025)

- Entwurf zur EEG Novelle: **RES targets stay (Jan 2026)**
  - **BUT: Some doubt if the targets can be reached** with current instruments and upcoming laws
  - e. g., Offshore wind target will not be reached in time

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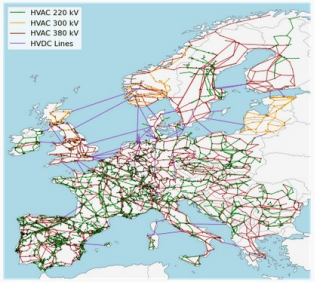
BACKGROUND: PYPSA-DE

PyPSA

A python software toolbox for simulating and optimising modern power systems.

Documentation »

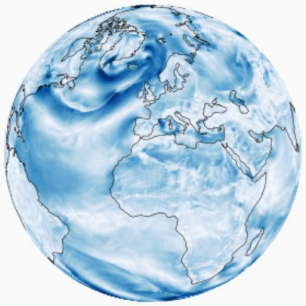
PyPSA-Eur



A Sector-Coupled Open Optimisation Model of the European Energy System

Documentation »

Atlite



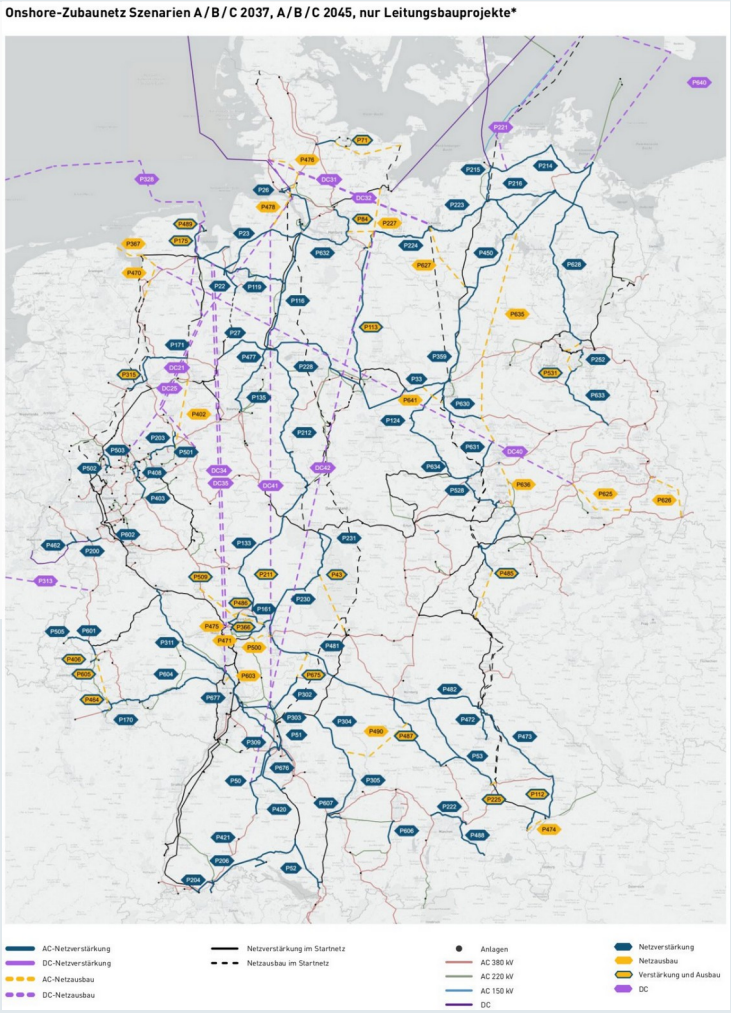
A Lightweight Python Package for Calculating Renewable Power Potentials and Time Series

Documentation »

Powerplantmatching

A toolset for cleaning, standardizing and combining multiple power plant databases.

Documentation »



- All sectors of the energy system, multiple carriers (Elec, Gas, H2, CO2)
- 3H temporal resolution across full weather year
- 30 nodes in Germany, 1 node per neighboring country + ES + IT

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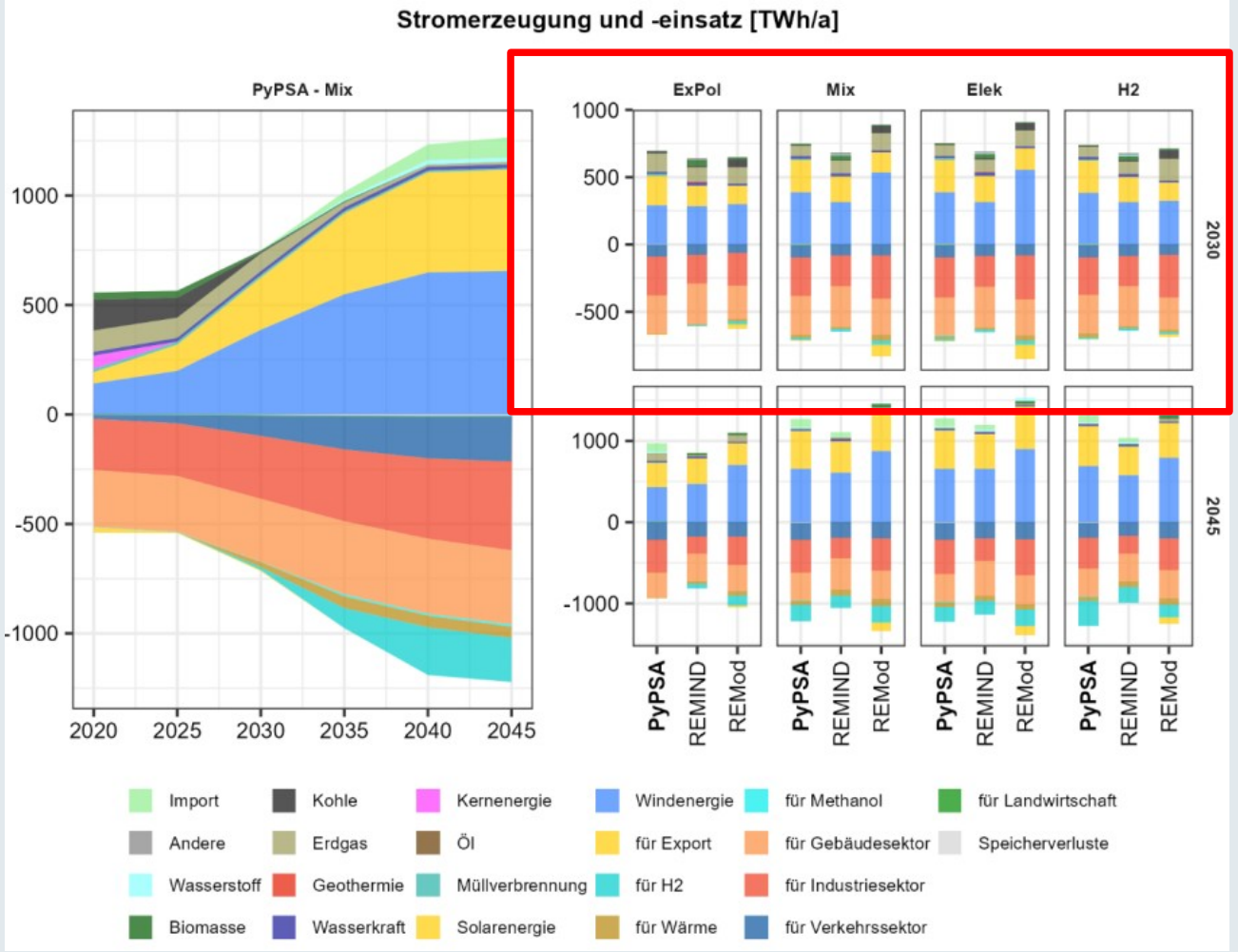
ARIADNE-SCENARIOS OVERESTIMATE ELECTRICITY DEMAND 2030 AS WELL

- **Model comparison in Ariadne-Report:**
  - Explorative Scenario ExPol: 643-692 TWh/a
  - Target-reaching Scenario Mix: 683-742 TWh/a
  - Monitoringbericht: 580-700 TWh/a
- **More sensitivites needed**



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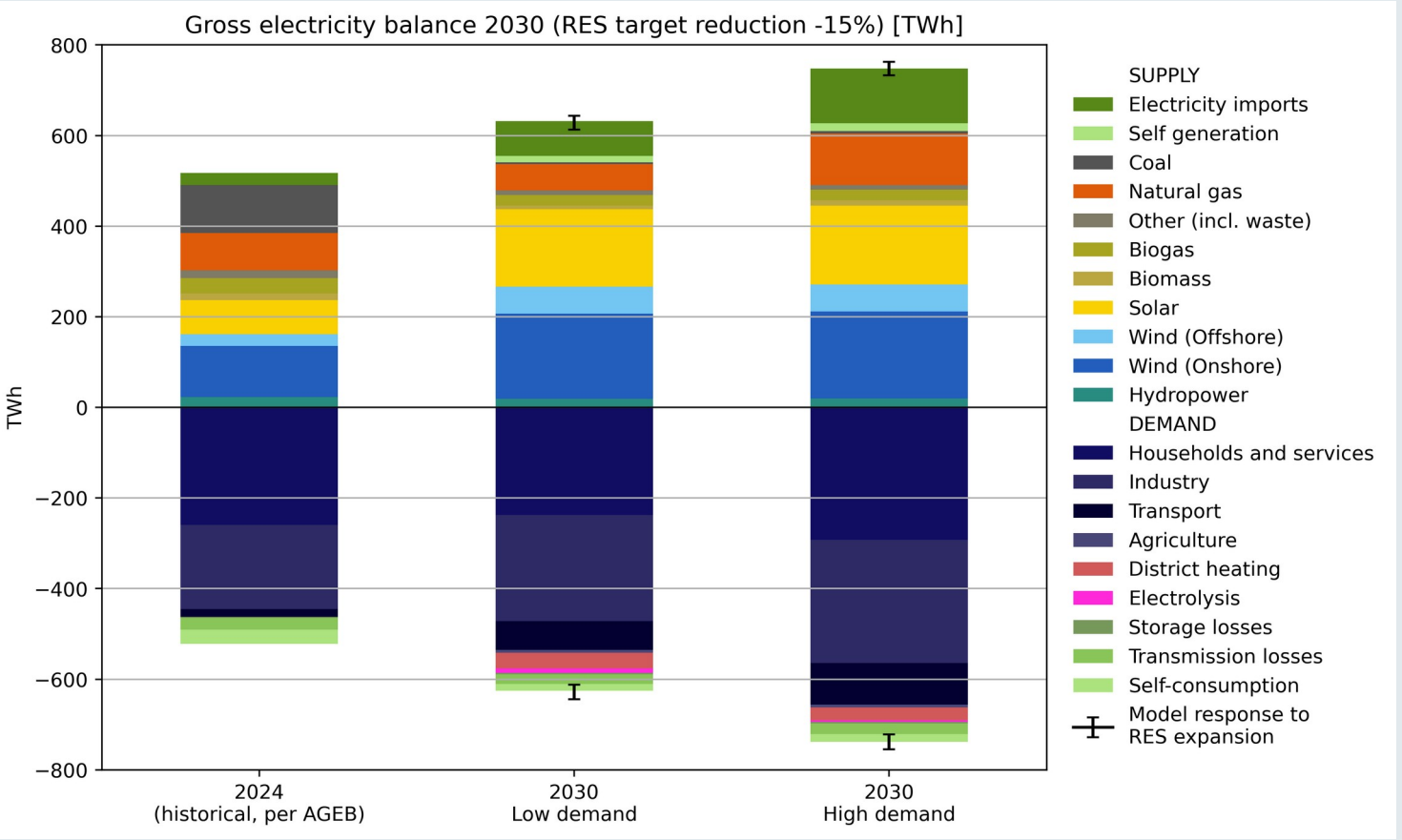
ARIADNE-REPORT: SENSITIVITY STUDY FOR 2030

- **2 Demand Scenarios:**
  - **Low Demand (612–644 TWh)**: based on UBA-Projektionsbericht 2025
  - **High Demand (722–754 TWh)**: based on Ariadne-Bericht: higher electrification rate & more demand in industry
- **RES targets:**
  - Several steps between reaching the targets and up to 30% reduction



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IMPACTS OF REDUCING THE RES TARGETS

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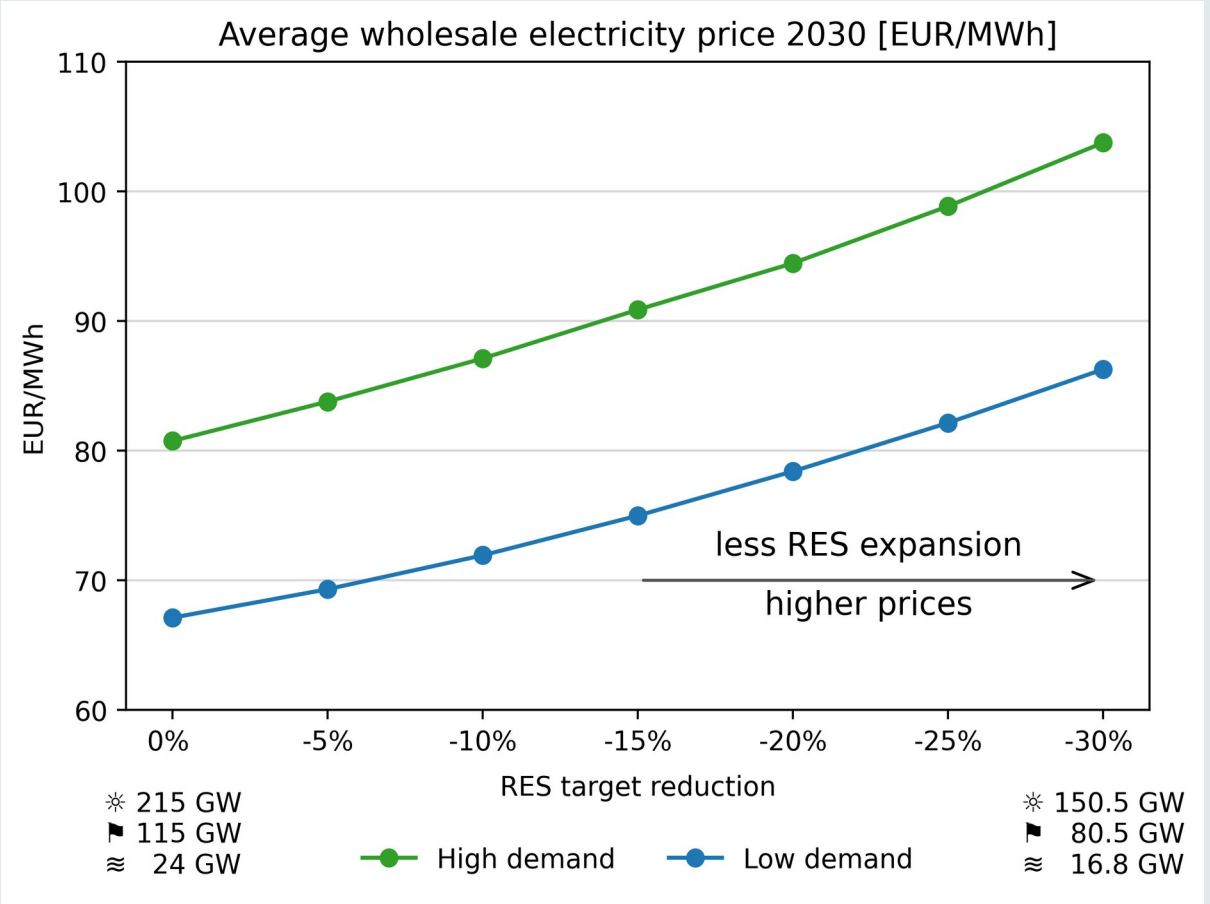
LESS EXPANSION OF RES: HIGHER ELECTRICITY PRIZES

- Expansion of RES reduced by 30%:
  - **Electricity prize 20€/MWh higher**
  - **Additional costs for customers of 9.0 bn € up to 13.2 bn €**

- Electricity is about 13 €/MWh cheaper in the Low Demand scenario



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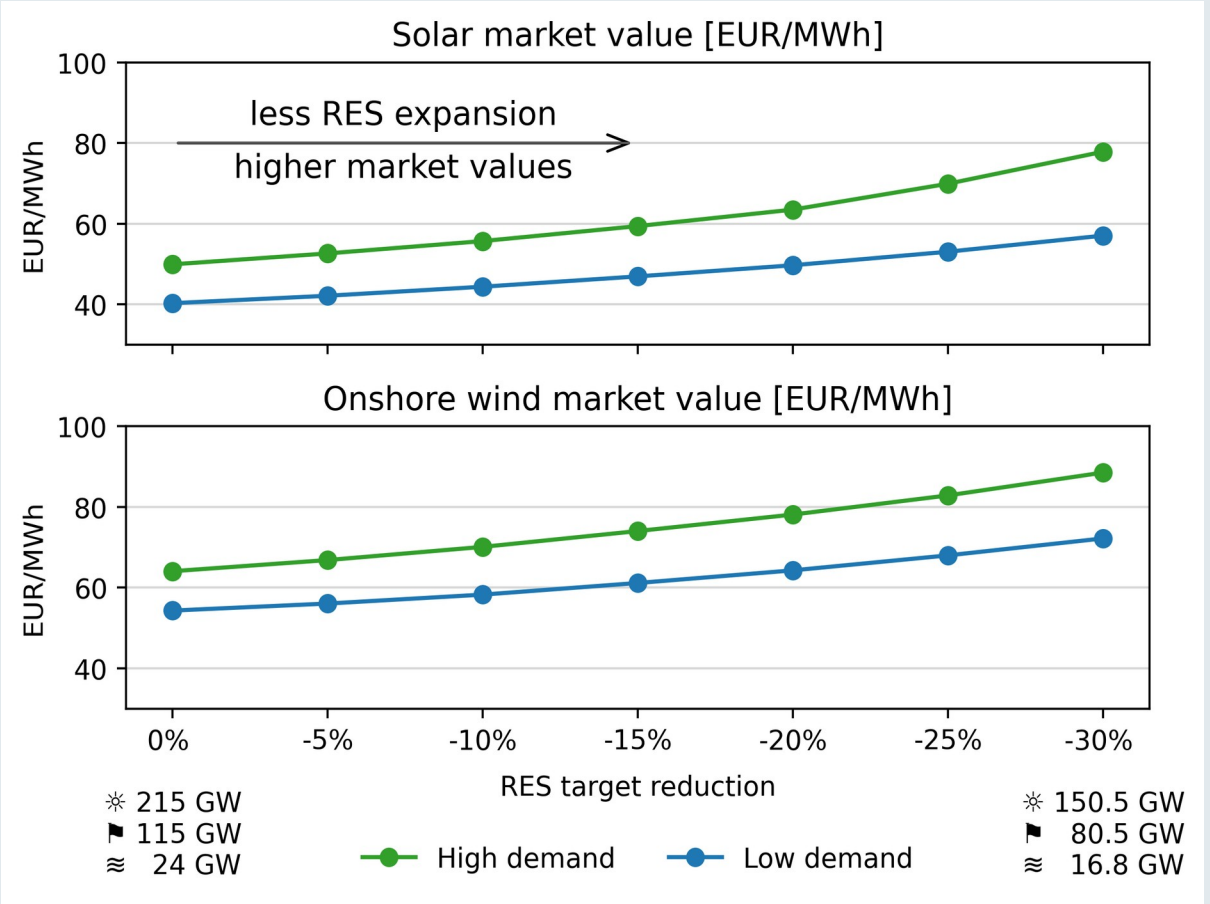
LESS EXPANSION OF RES: HIGHER MARKET VALUES

- **Less expansion of RES leads to higher market values**
- Difference is similar to electricity prize difference



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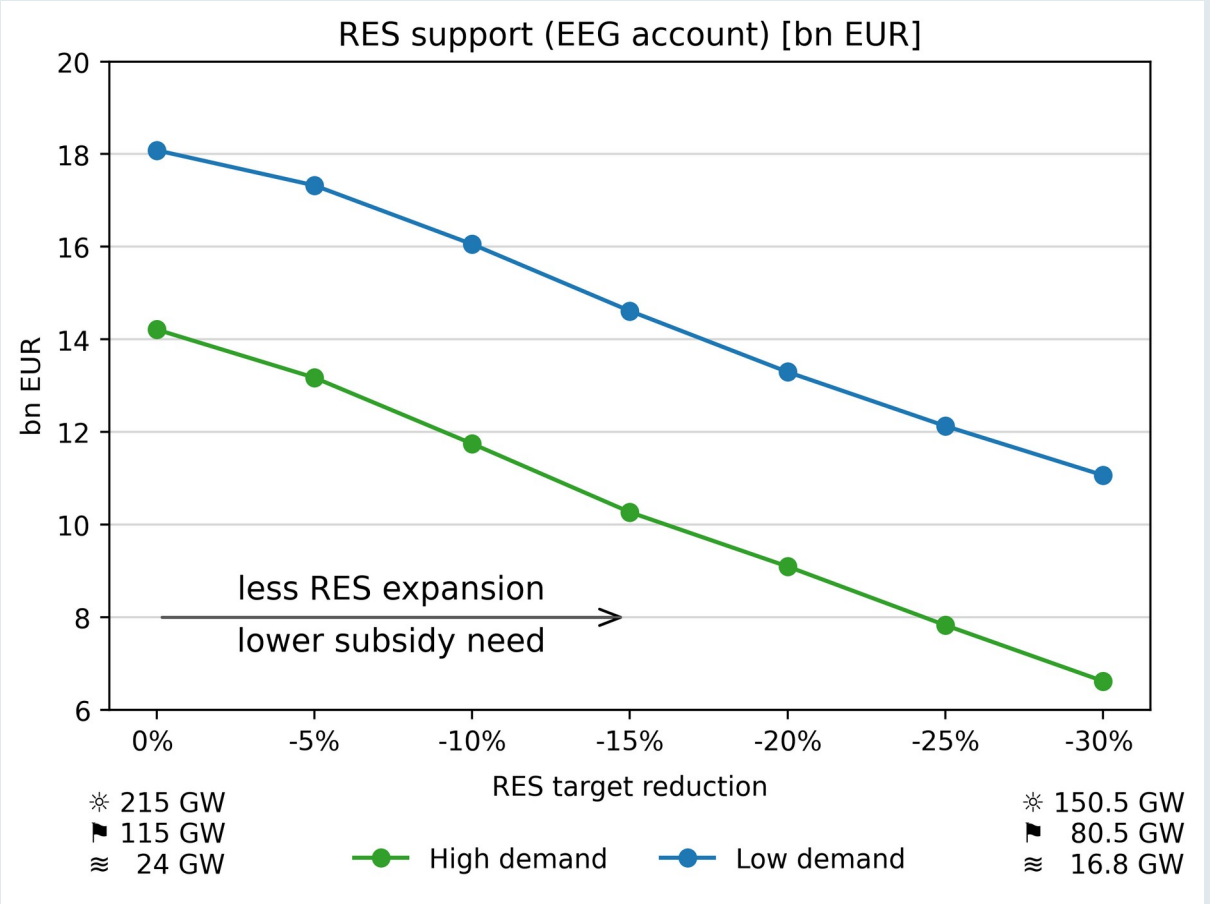
LESS EXPANSION OF RES: LESS SUBSIDIES THROUGH THE EEG ACCOUNT

- **Less expansion of RES leads to higher market values**
- Difference is similar to electricity prize difference

- **The subsidy need through the „EEG Konto“ is 7.5 bn € lower**, if expansion of RES is reduced by 30%



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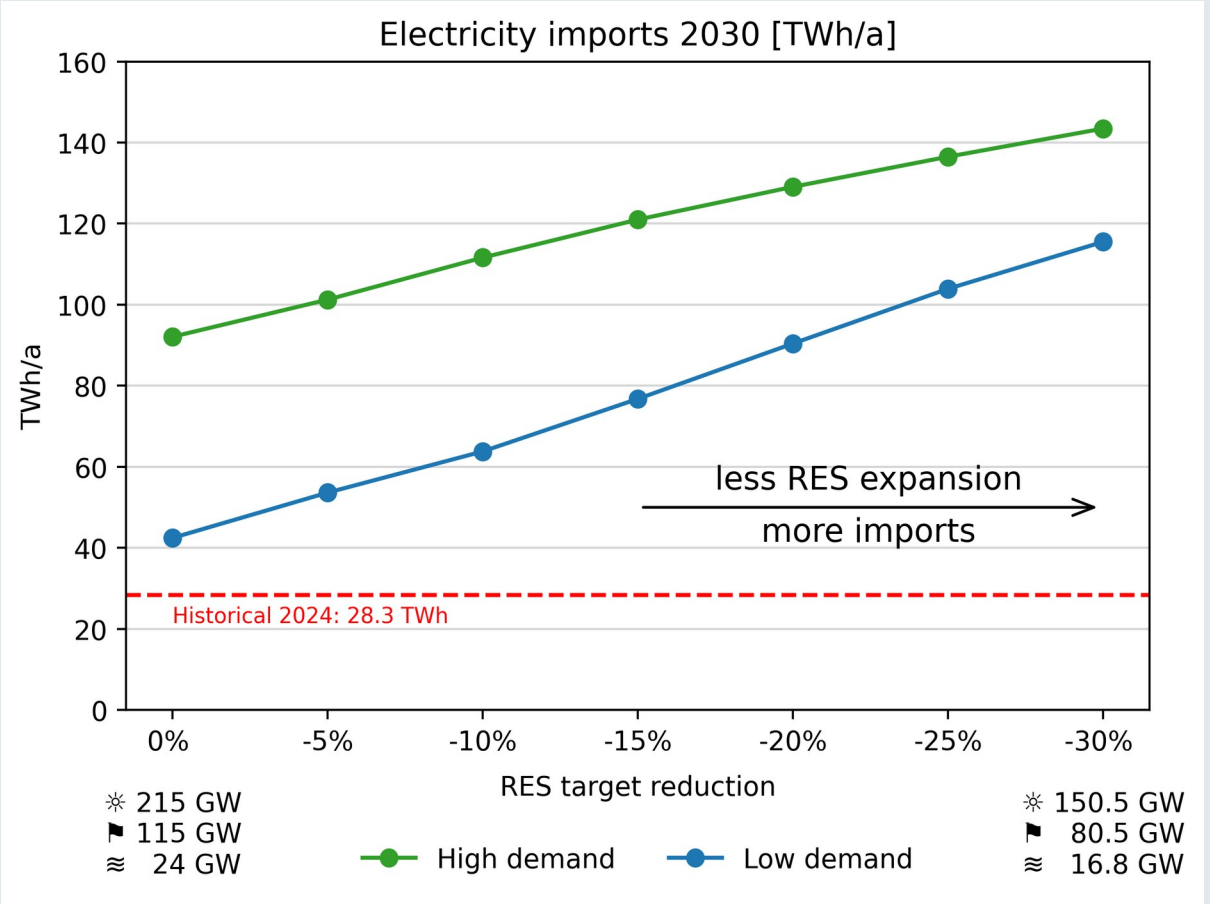
LESS EXPANSION OF RES: MORE ELECTRICITY IMPORTS

- **In all scenarios signficiantly higher electricity imports than 2025**

- Expansion of RES reduced by 30%:
  - **Significantly more than 100 TWh of imports needed**
  - **Leading to additional costs of about 5 bn €**



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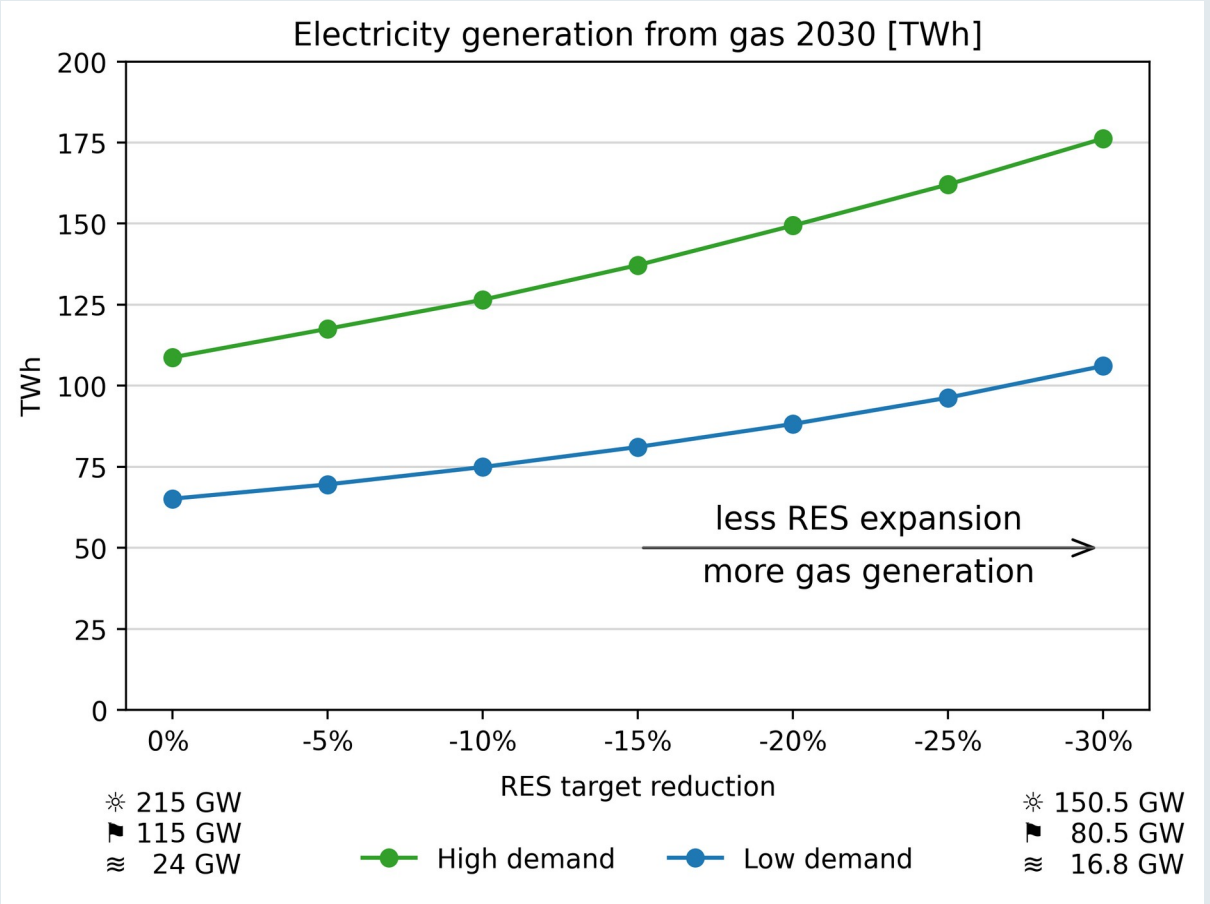
LESS EXPANSION OF RES: MORE ELECTRICITY GENERATED FROM GAS

- Electricity generated from gas 2030:
  - **65 TWh in Low Demand** (like 2025)
  - **109 TWh in High Demand**

- Expansion of RES reduced by 30%:
  - Another **+41–67 TWh Electricity** from gas
  - Costs for natural gas imports increase by 0.9 to 1.5 bn € (or more???)



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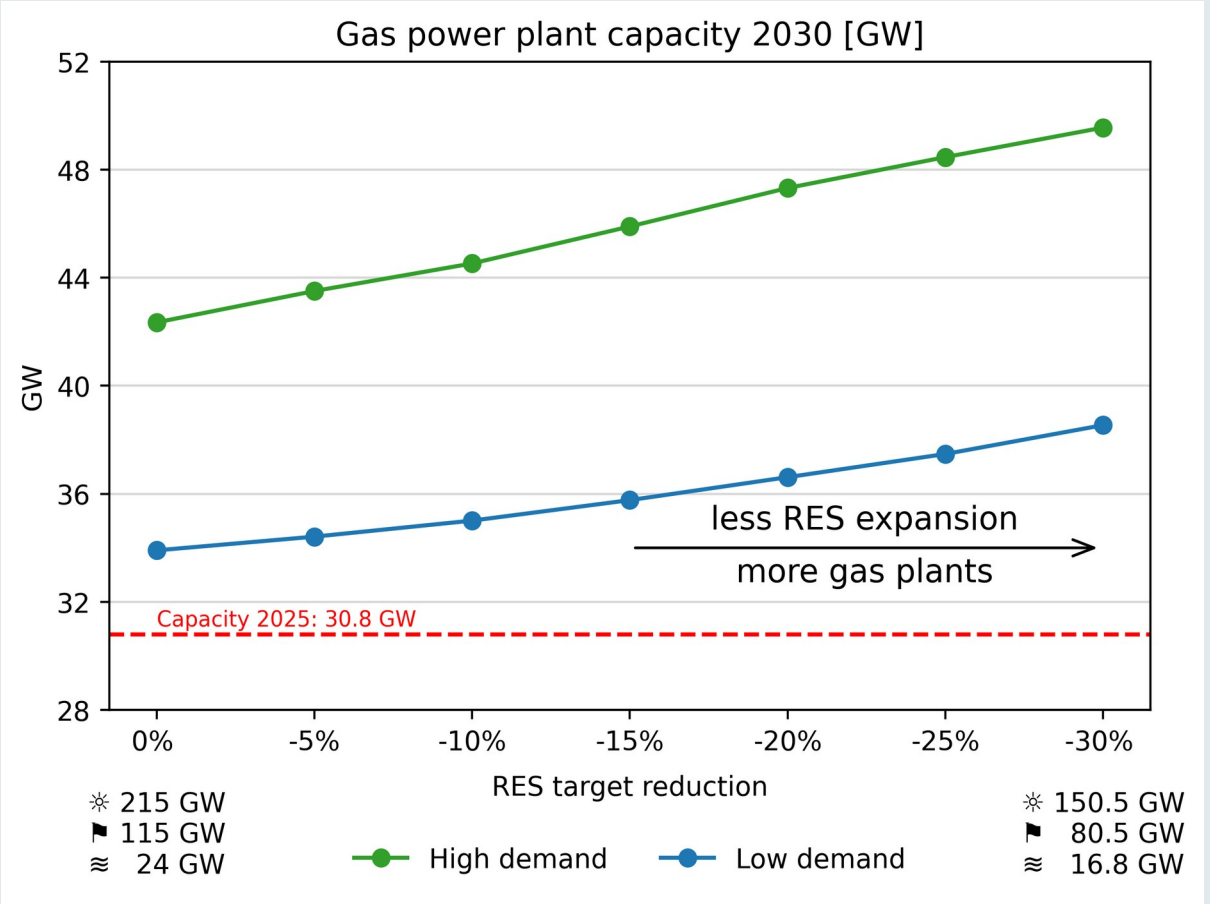
LESS EXPANSION OF RES: MORE GAS POWER PLANTS

- Compared to 2025:
  - **+ 3 GW gas power plants in scenario „Low Demand“**
  - **+ 11 GW in scenario „High Demand“**
- Expansion of RES reduced by 30%:
  - **Another +5–8 GW (total of 39–50 GW)**
  - Hard to achieve
  - Will coal run as a replacement?
- **BUT: Market optimum, not a study of security of supply**



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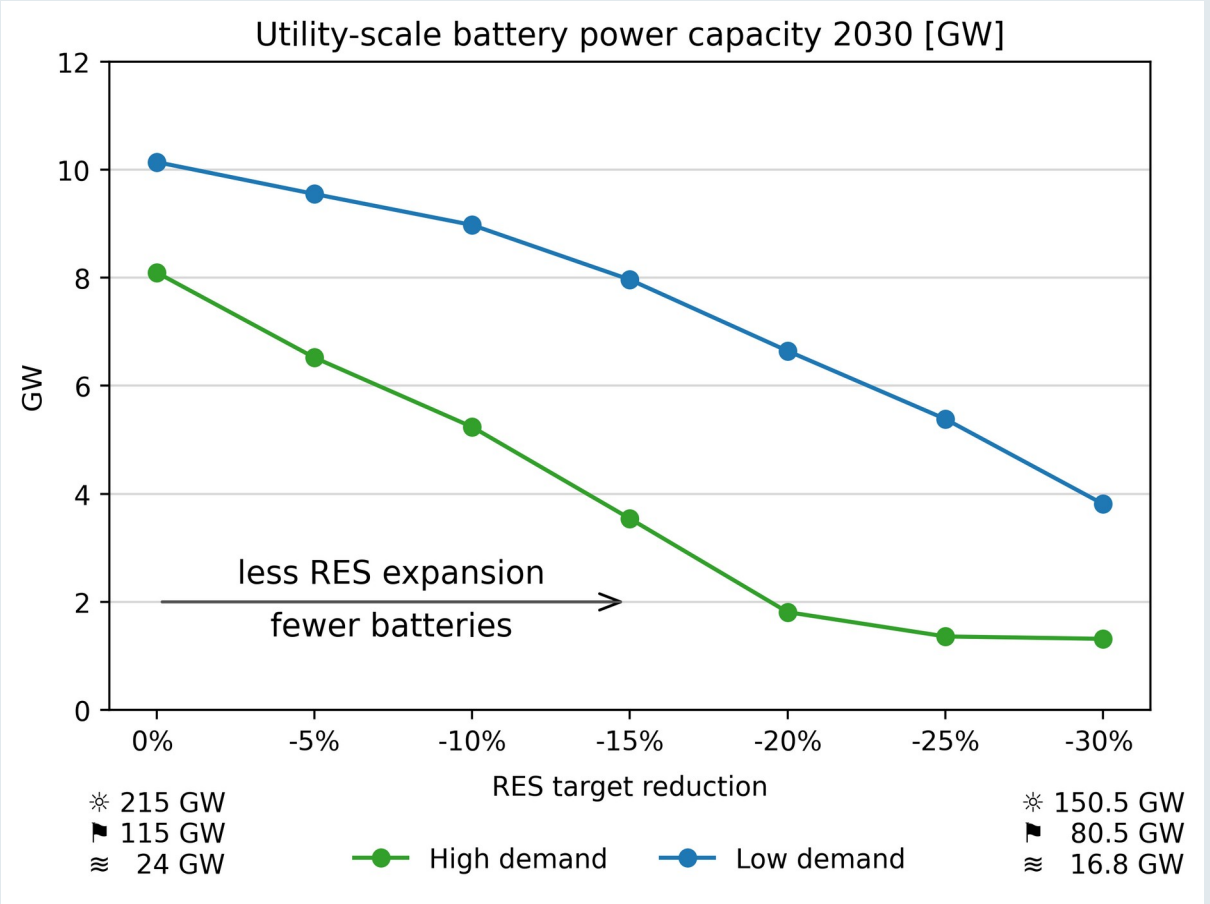
LESS EXPANSION OF RES: LESS BATTERIES

- **Battery inverter capacity decreases, while gas capacity increases**
- **Combination of RES + Batteries is able to substitute some gas demand**
- May help during gas turbine shortage



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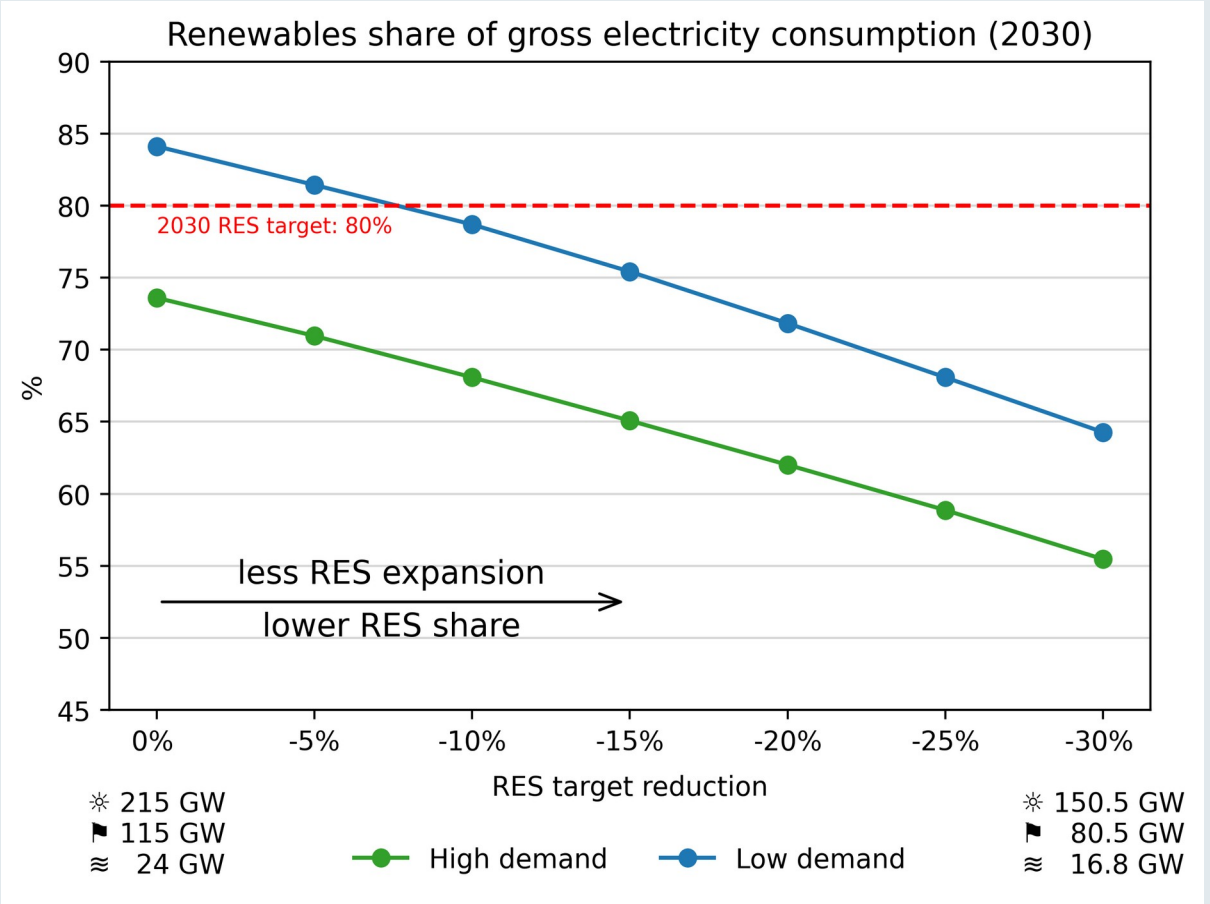
LESS EXPANSION OF RES: 80%-TARGET FOR ELECTRICITY FAILED

- **In the „High Demand“ scenario the 80% target is missed in any case**
- **In the „Low Demand“ scenario the 80% target is in danger, if the RES capacities are reduced by more than 5%**
- Offshore Wind likely to reach only 20 GW



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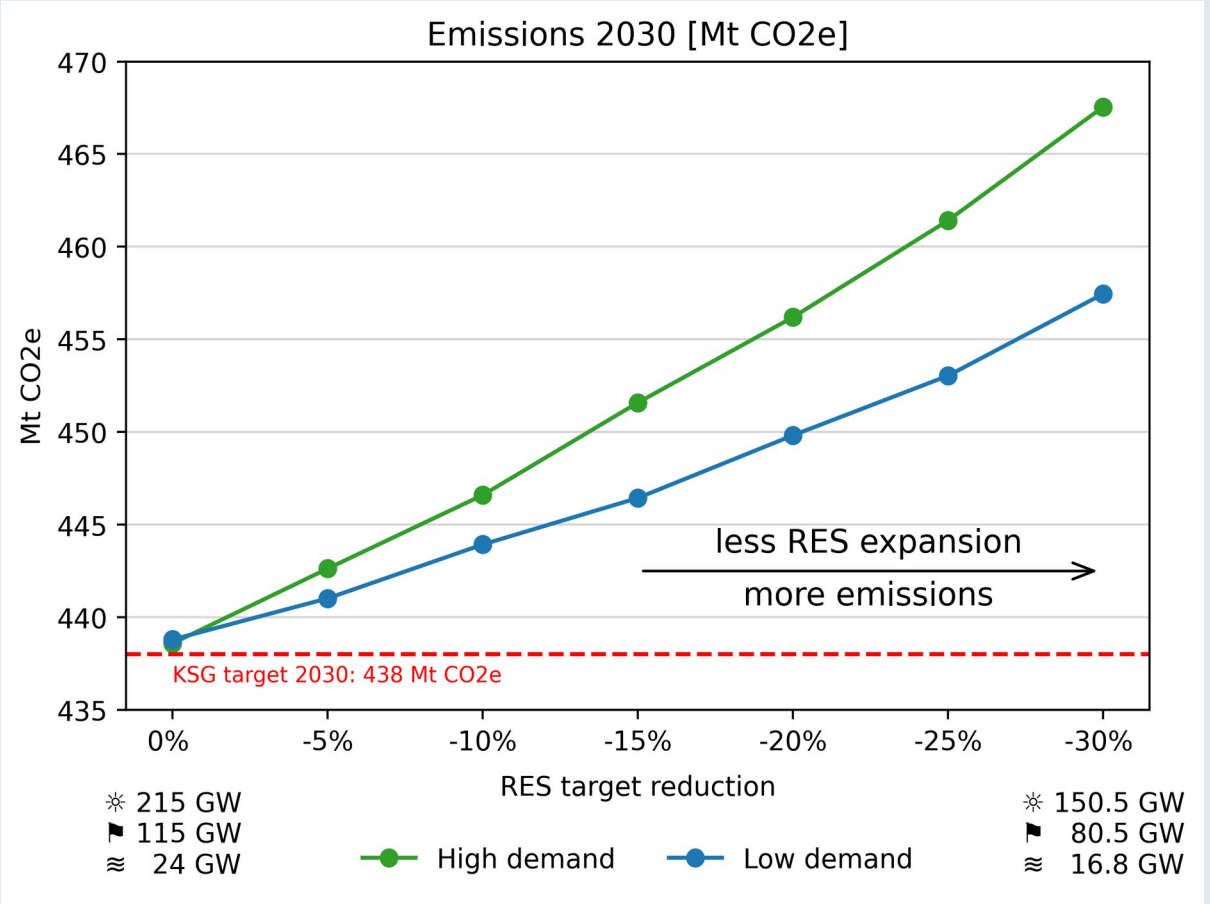
LESS EXPANSION OF RES: MORE CO2 EMISSIONS

- **Constant CO2-Price**
- Contraint: Emissions target reached for base case

- **Every reduction of RES expansion leads to missing the emission target of below 438 Mt CO2e**

- In the scenario „Low demand“:
  - **Lower electricity and industry demands compensate**
  - **missing electrification in the buildings and the transport sectors**



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SENSITIVITY: MISSING FLEXIBILITY

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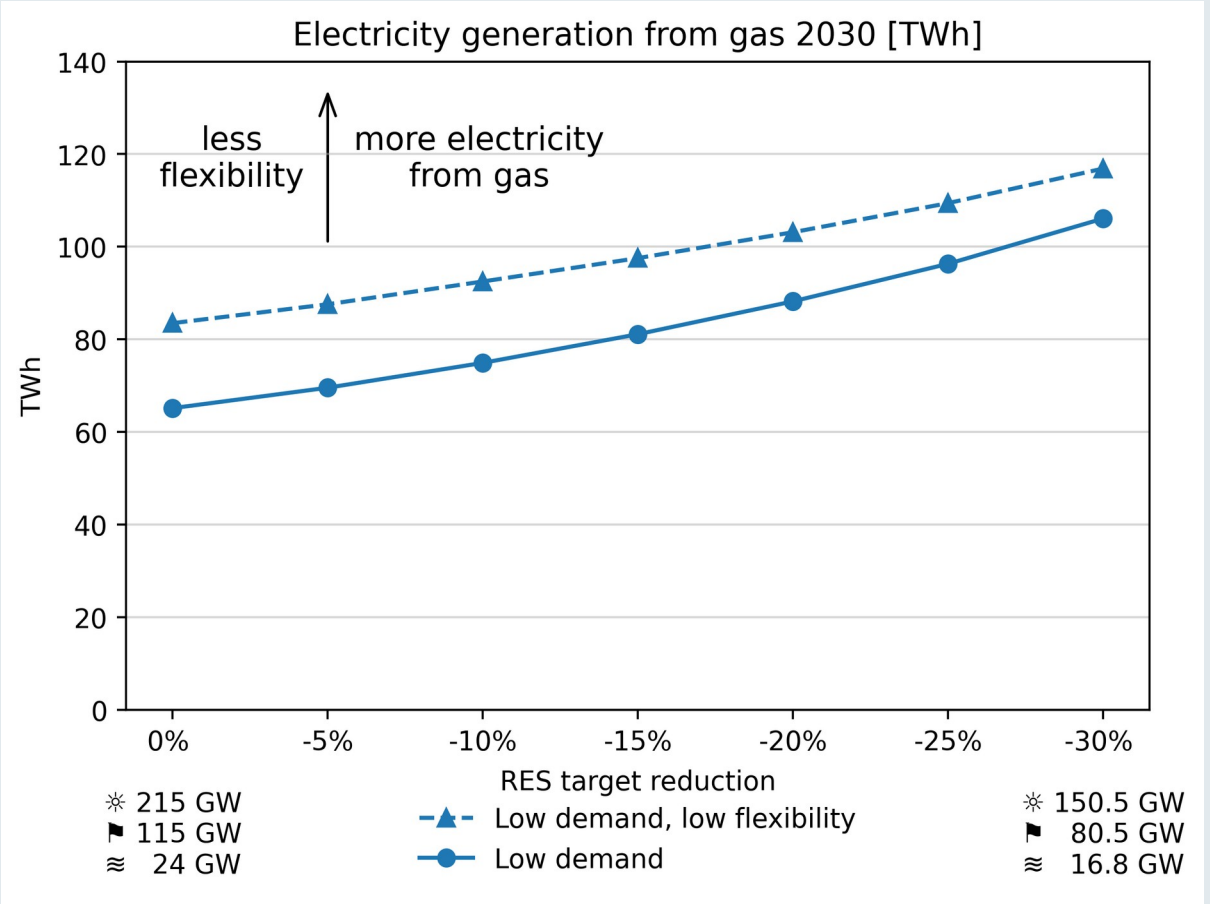
LESS FLEXIBILITY: MORE ELECTRICITY GENERATED FROM GAS

- Sensitivity of the „Low Demand“ scenario:
  - **No expansion of batteries after 2025**
  - **BEV do not charge flexibly**
  - **Heat pumps and home batteries do not react to market prices**
- Result:
  - **More electricity generation from gas**



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- Result:
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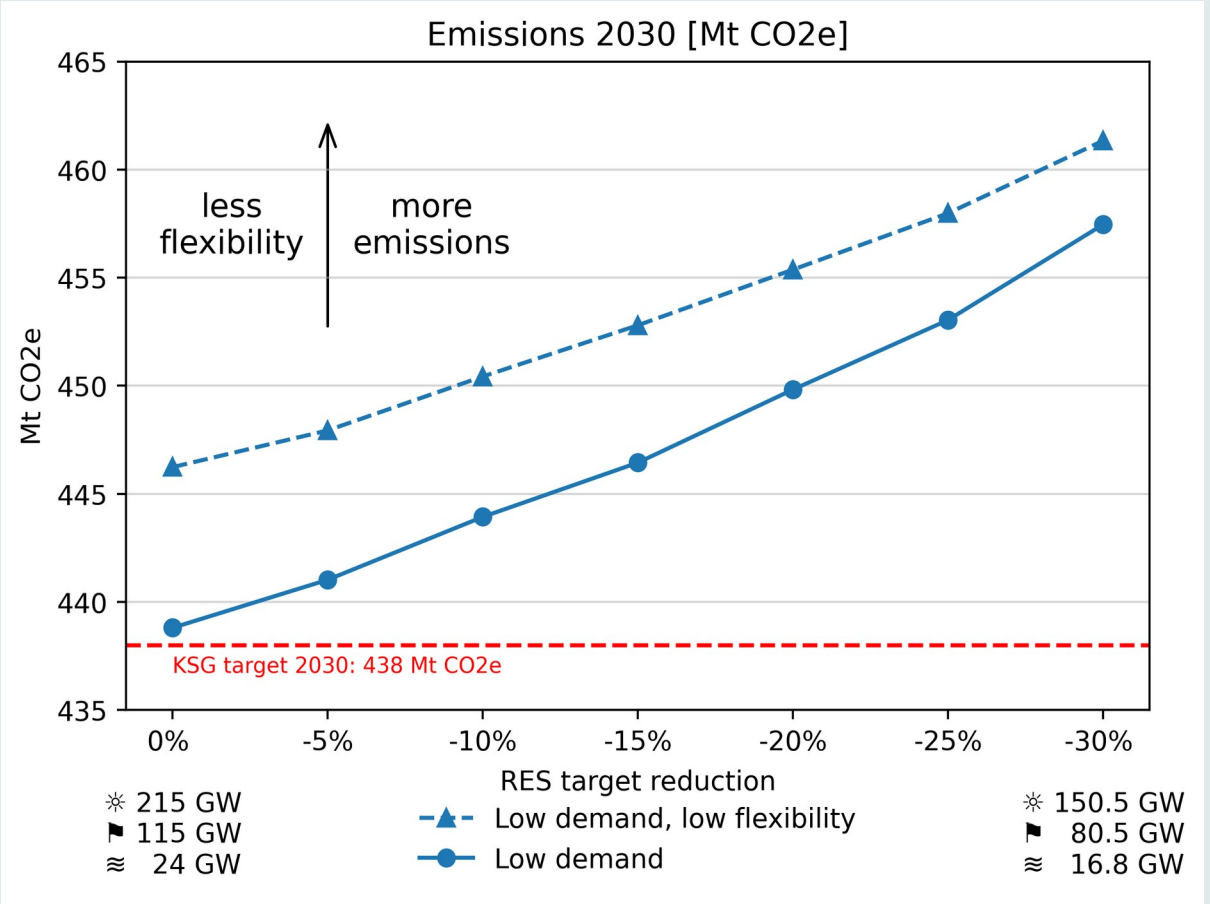
  - **More emissions**



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CORE MESSAGES

- The model results show: Reducing RES expansion by 30% **increases electricity prices** in Germany by **more than 20 €/MWh** (2 ct/kWh, about 30 %)
- If targets are reduced by 30%, **electricity customers will pay €9.0–13.2 billion more** in 2030; however, the funding requirement for the **EEG account will fall by €7.0–7.5 billion €**
- Reducing the targets will lead to a **greater need for new gas-fired power stations**, increased gas generation, and **greater reliance on imports** due to higher gas and electricity imports
- **Flexibility is essential** for achieving climate targets and **ensuring the cost-efficiency** of the electricity system
- The **80% target** for the share of renewable energy in electricity generation will only be achieved with a significant expansion of renewable energy
- **The 2030 GHG target is at risk if the expansion of renewable energy is scaled back**

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PUBLICATION

www.ariadneprojekt.de → Publikationen

› **Report: Auswirkungen einer Anpassung der Ausbauziele für Erneuerbare Energie für das Jahr 2030**

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