Ea Energy Analyses

Nordic Power Market Forecast

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Nordic Renewable Investment Seminar – 23/24 May 2024

Analyses of public regulation and policy

Ea Energy Analyses has a long track record in analyses and evaluation of regulation and policy in the green transition. See examples.

- BALMOREL: POWER SYSTEM MODEL
- OTHER MODELS: SISYFOS AND STREAM
- HEATING
- REGULATION AND POLICY MEASURES
- ENERGY END USE, EFFICIENCY AND DEMAND RESPONSE
- WIND AND SOLAR POWER

Latest news

Ea hosts workshops for Indonesian partners

Earlier in May, Ea had the pleasure to host two workshops with partners from Indonesia, along with the DEA, to

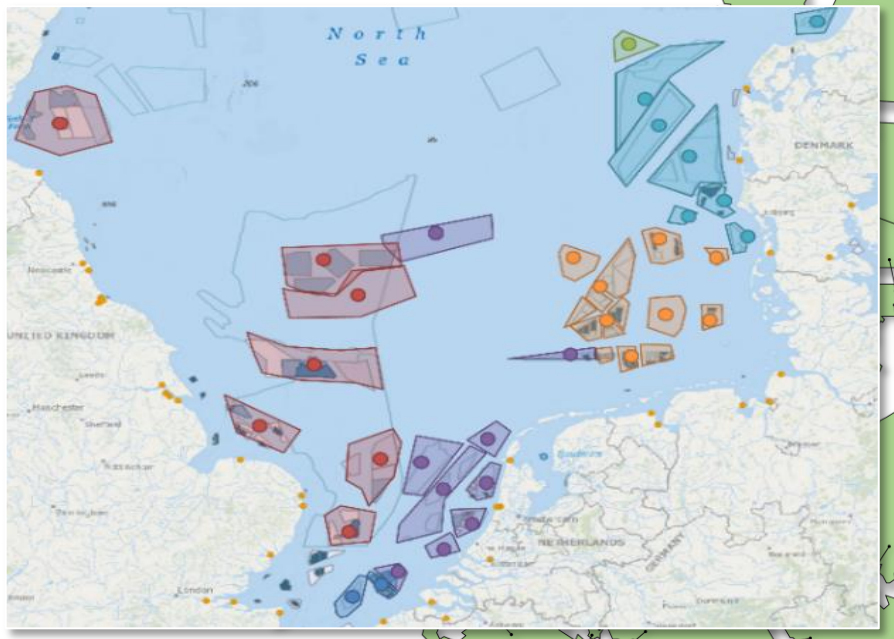
Ea Energy Analyses advises the Irish Government on its Hybrid Interconnector policy design

Ea participates in China Energy Modeling Forum (CEMF) 2024

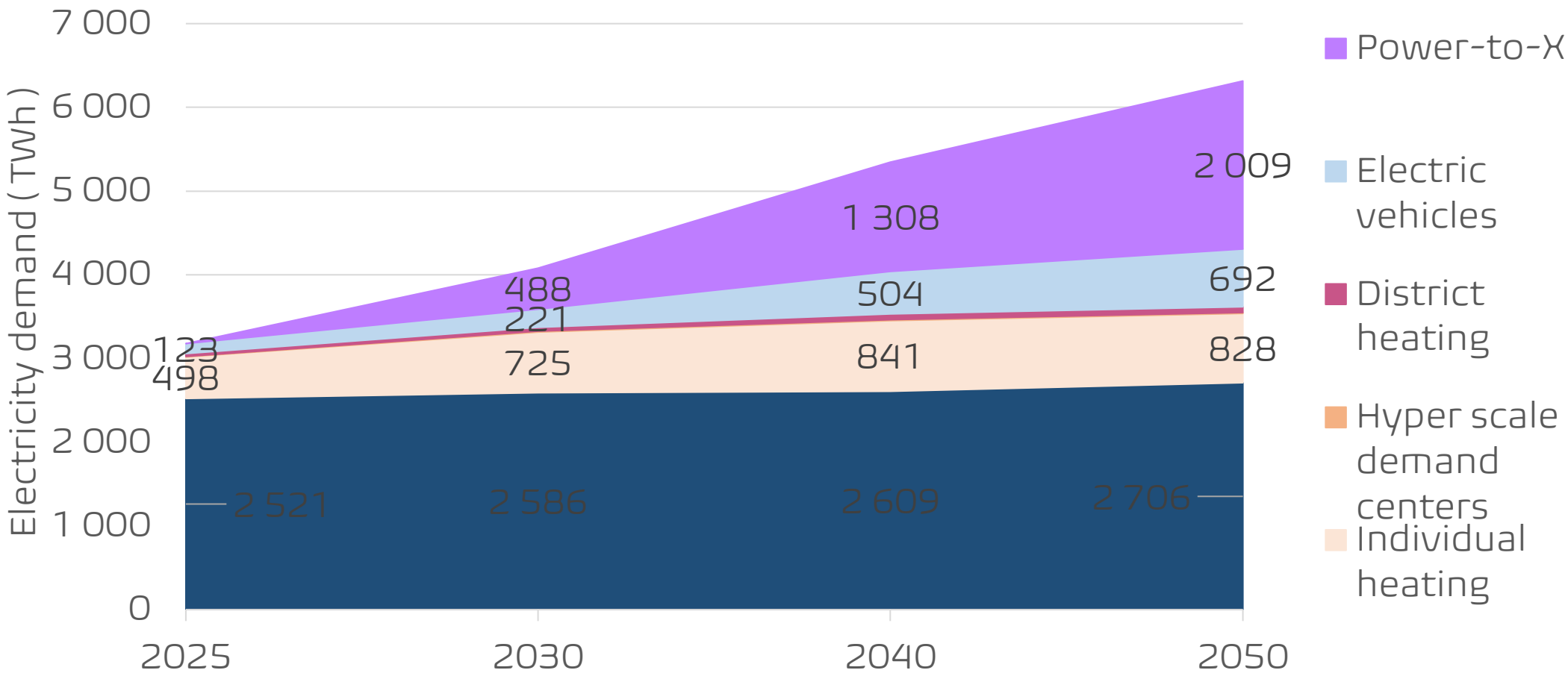
On April 24, 2024, the 8th China Energy Modeling Forum (CEMF) with the theme "Towards 2035: Accelerating the

Approach to power price Forecasting

- Europe pursues a net zero energy system in 2050
  - Demand: ENTSO-E's Global Ambition scenario for electricity demand (TYNDP2022)
  - Generation: ENTSO-E's National trends scenario for short term targets towards + selected adjustments (TYNDP2022)
  - Transmission: ENTSO-E's projects towards 2030 for transmission system development
  - PtX: The European Commissions REPower Europe strategy for hydrogen demand by 2030
- Country specific adjustments: mainly Denmark, Sweden and Germany
- Simultaneous investment and dispatch optimization
  - Technology catalogue: generation, transmission, PtX, **hydrogen infrastructure**, district heating
  - **Offshore** with close to site level detail

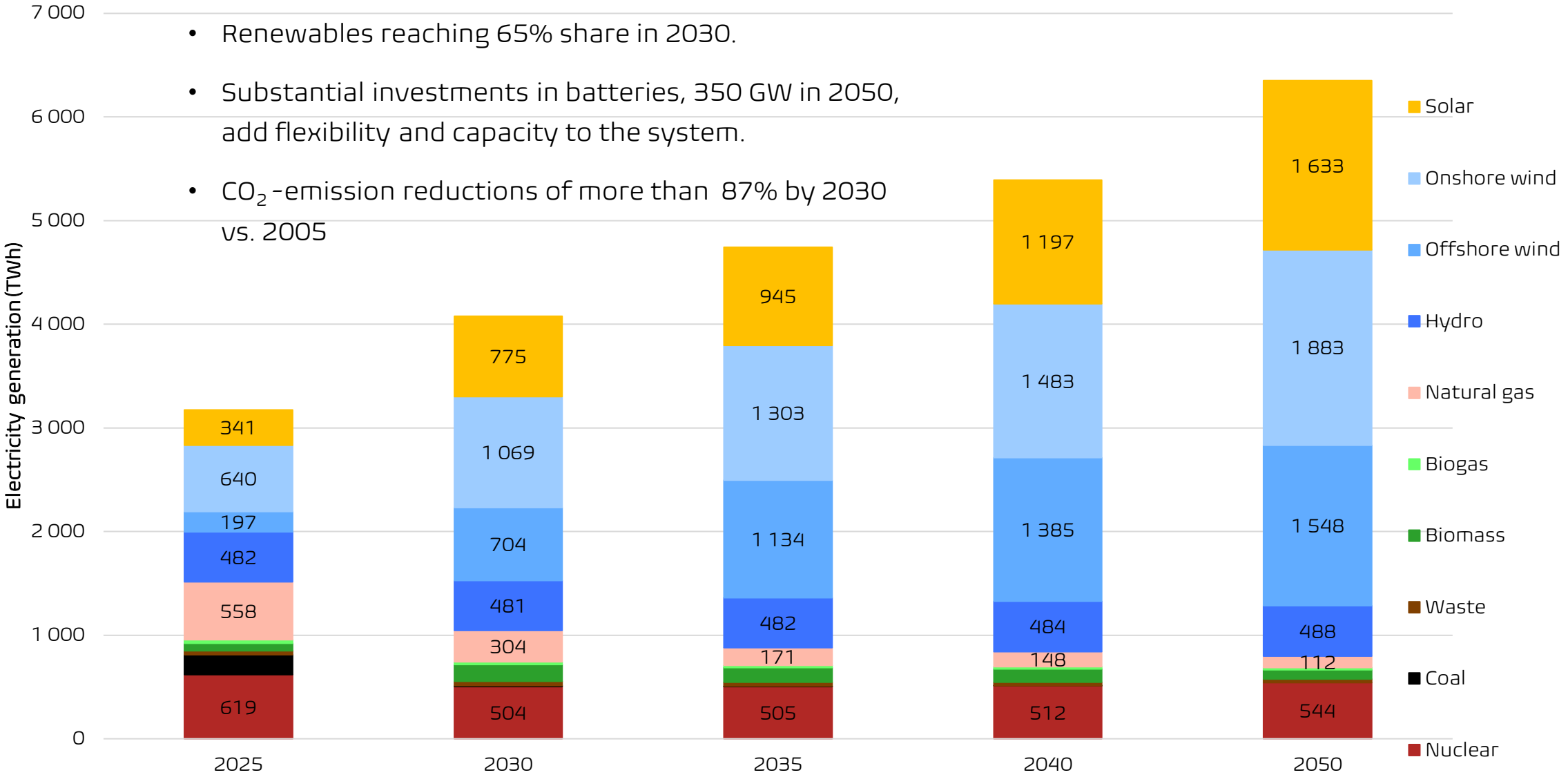


Electricity demand Europe



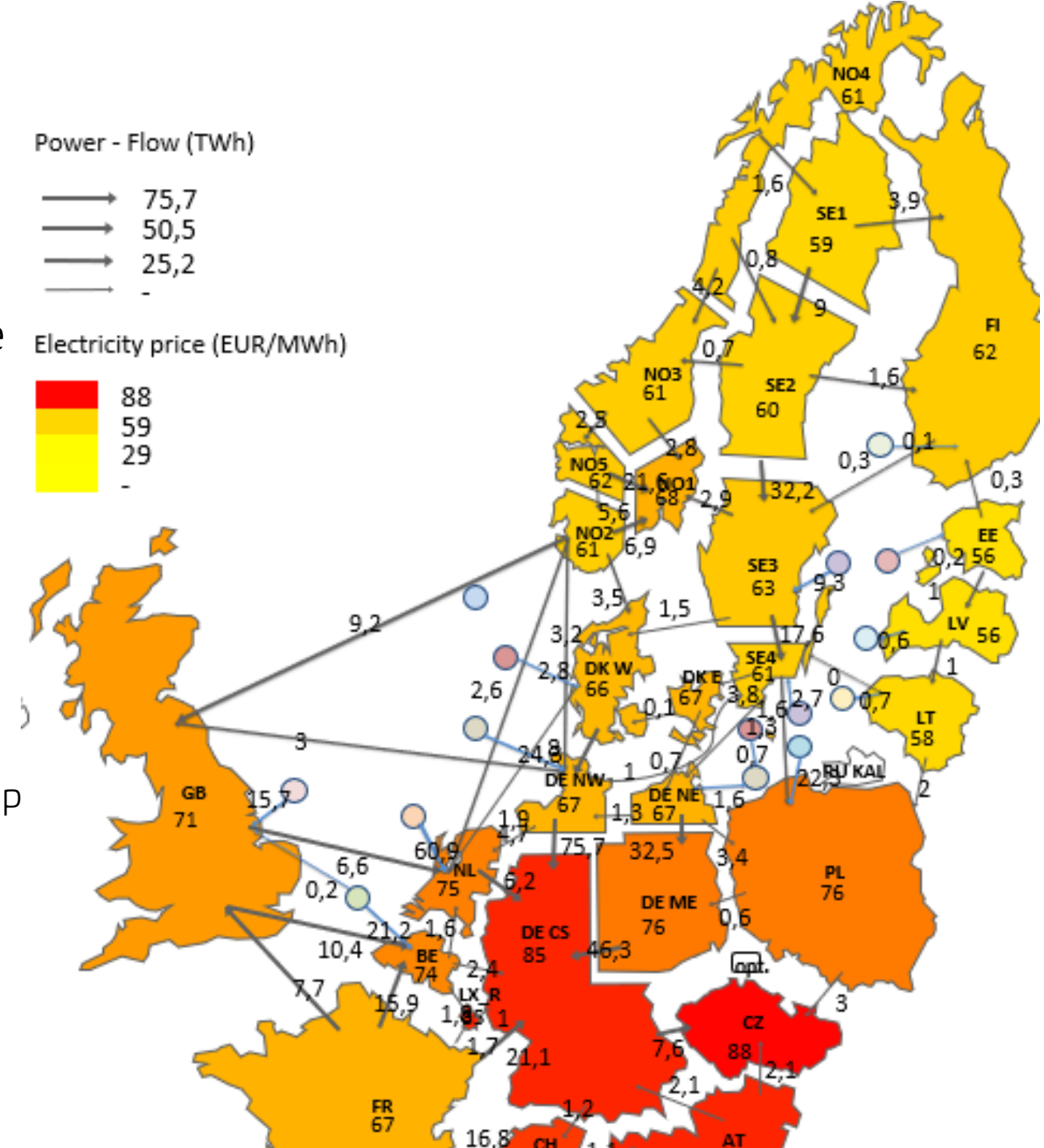
Power system development in Europe

- Renewables reaching 65% share in 2030.
- Substantial investments in batteries, 350 GW in 2050, add flexibility and capacity to the system.
- CO_2 -emission reductions of more than 87% by 2030 vs. 2005



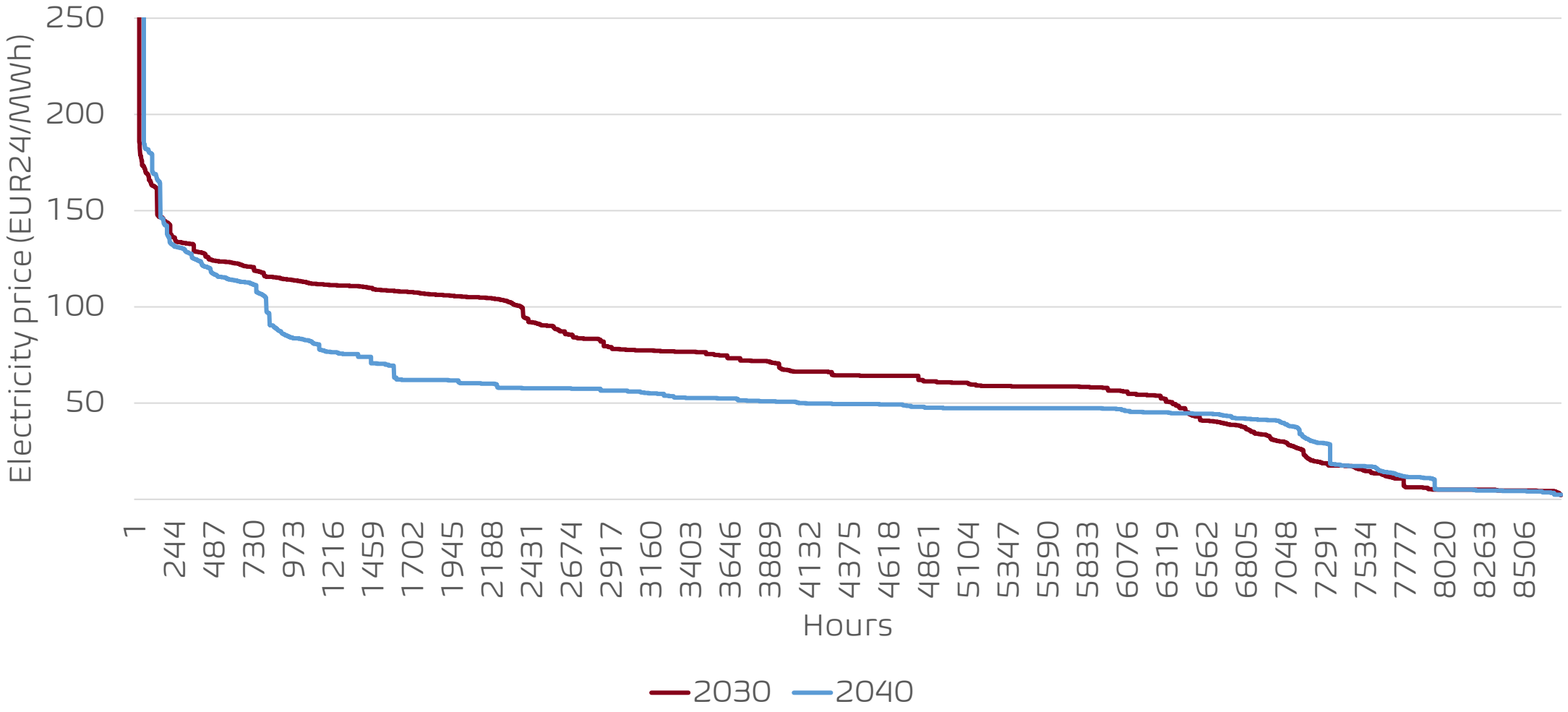
European power prices 2030

- Comparatively low power prices in the Nordic countries compared to continental Europe and UK.
- Nordic countries export about 30-35 TWh
- Nordic power demand for hydrogen production amounts to 135 TWh
  - That's 27% of EU demand
  - For comparison the Nordic countries make up 14 % of non-PtX demand

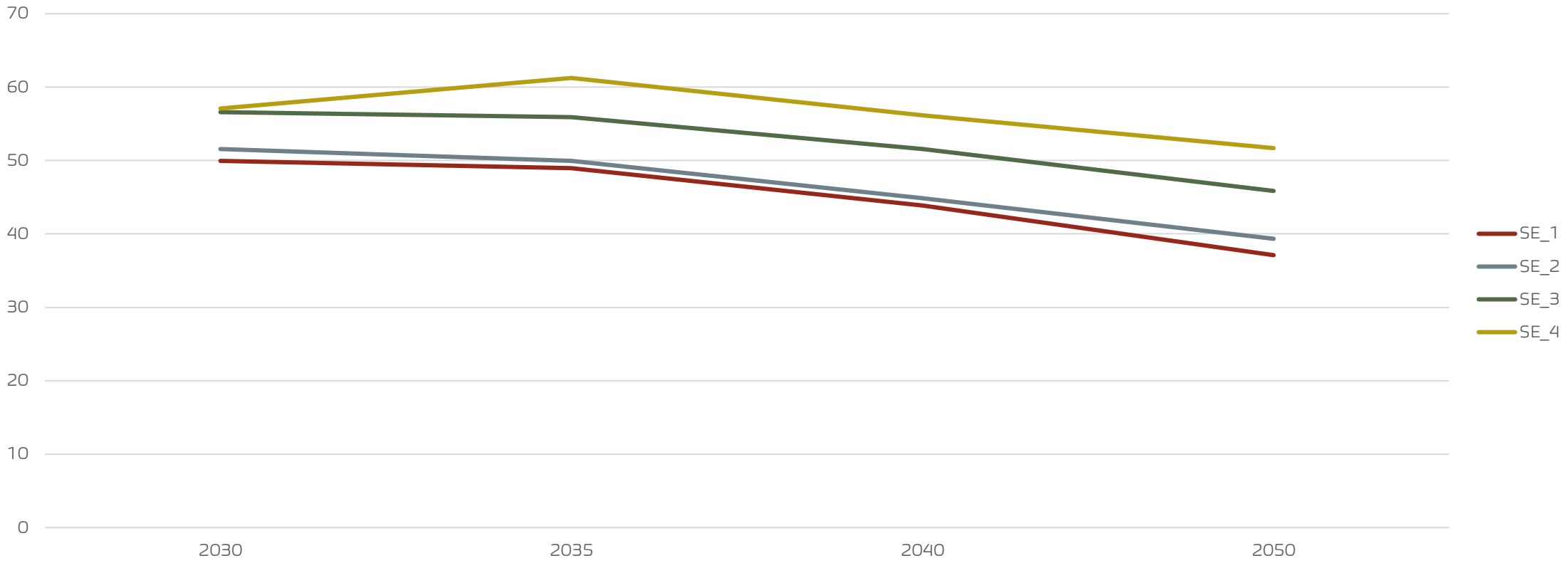


Price in EUR2022/MWh

Hourly electricity prices – DK2

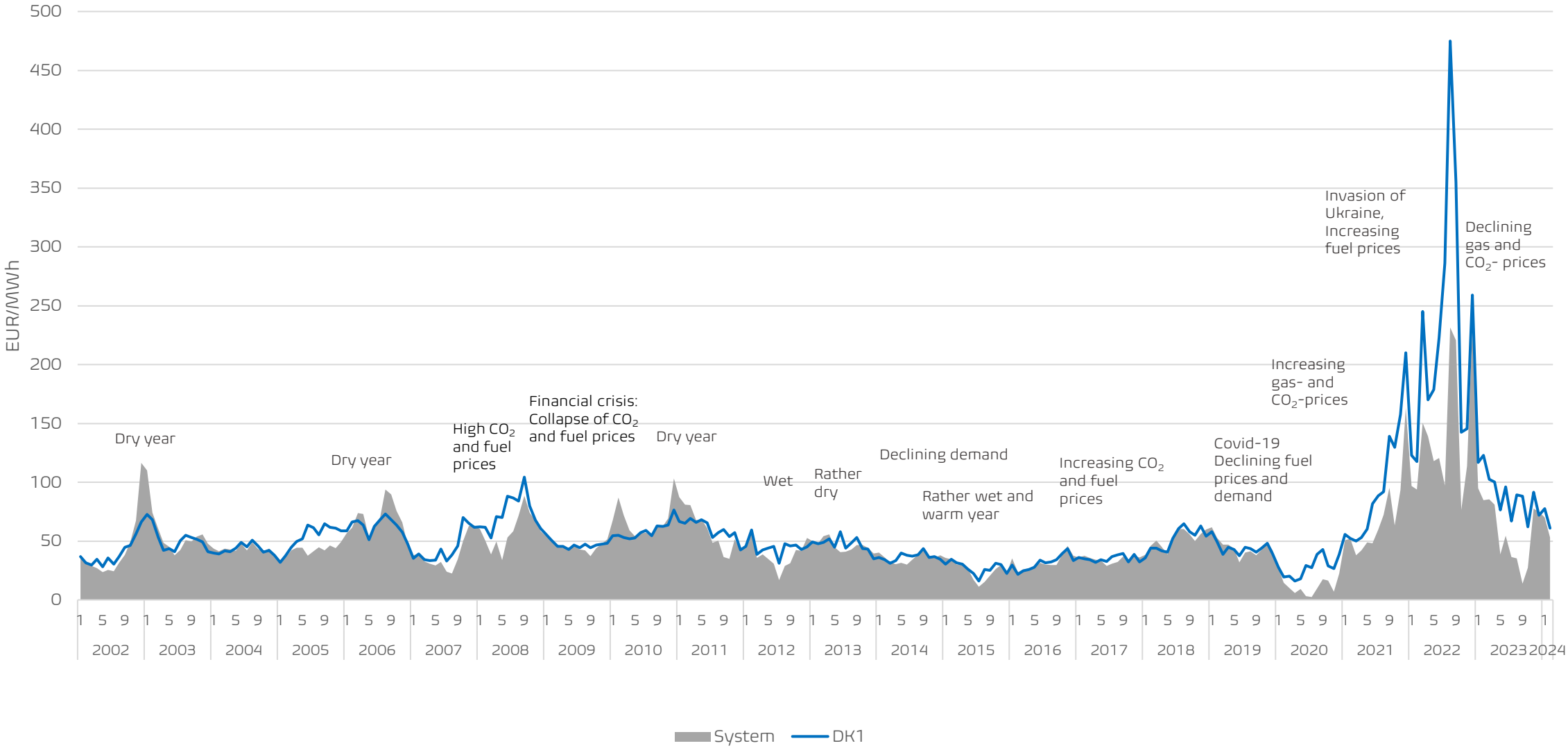


Average power prices in Sweden over time



Prices drop over time as generation technologies + batteries become cheaper and cheaper.

Historical spot prices in the Nordics



Source: Energinet and ENTSO-E transparency platform. Real 2024-prices.

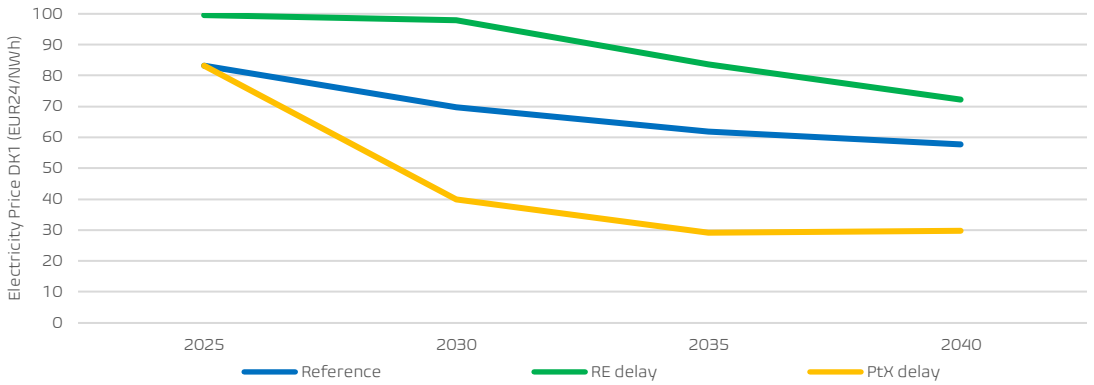
Power prices are very sensitive to the speed of RE-deployment and electrification

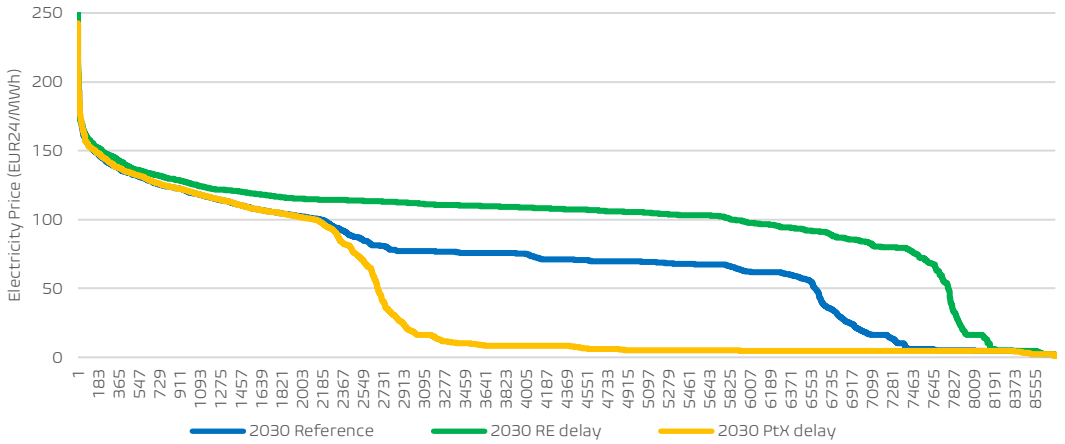
RE-delay sensitivity :

- Onshore wind turbines and solar PV capacity is delayed 1 year relative to the reference scenario.
- Offshore wind turbines are delayed 2.5 years relative to reference scenario.

PtX-delay sensitivity

- The demand for PtX is reduced by roughly 50% in 2030, and roughly 10% in 2040 and 2050 compared to the reference.





Scenario analysis for Energiforsk/NEPP

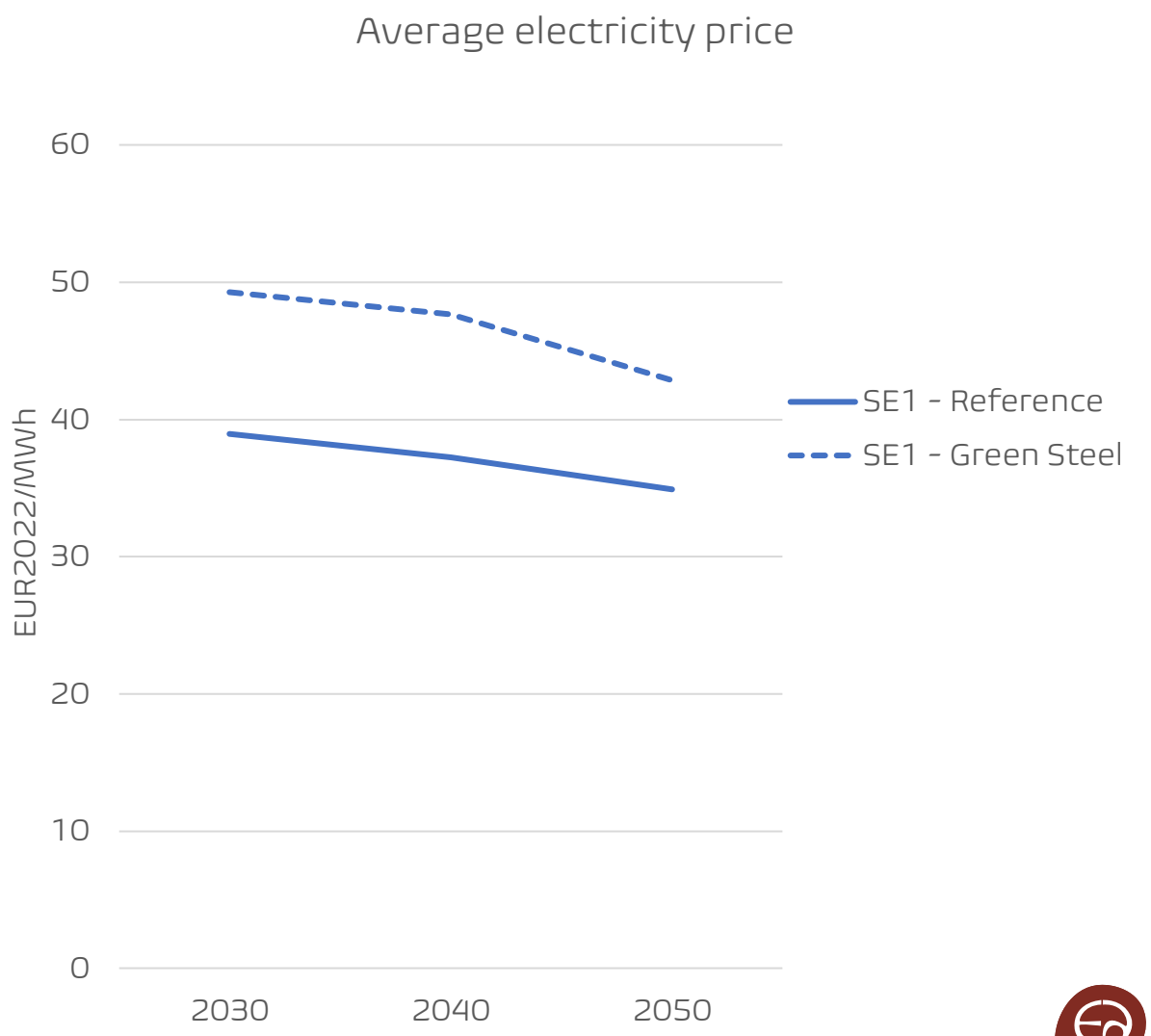
- Reference scenario
  - No hydrogen demand for steel production in SE1
  - Still increasing electricity demand in Sweden and production of H2 for other purposes
- Green steel scenario
  - Additional demand for hydrogen production in SE1
    - 43 TWh by 2030
    - 72 TWh by 2040
    - 90 TWh by 2050
- + 3 GW of nuclear capacity in SE3 by 2040 in all scenarios
- Caps on shore wind deployment to reflect planning constraints (20 GW by 2030 increasing to 30 GW by 2050)

Power prices in Sweden

SE1 prices increase by about 10 €/MWh in the green steel scenario.

Power prices in other parts of Sweden are less affected.

The scenarios display moderate prices in Sweden, less than 10 €/MWh even in SE4.



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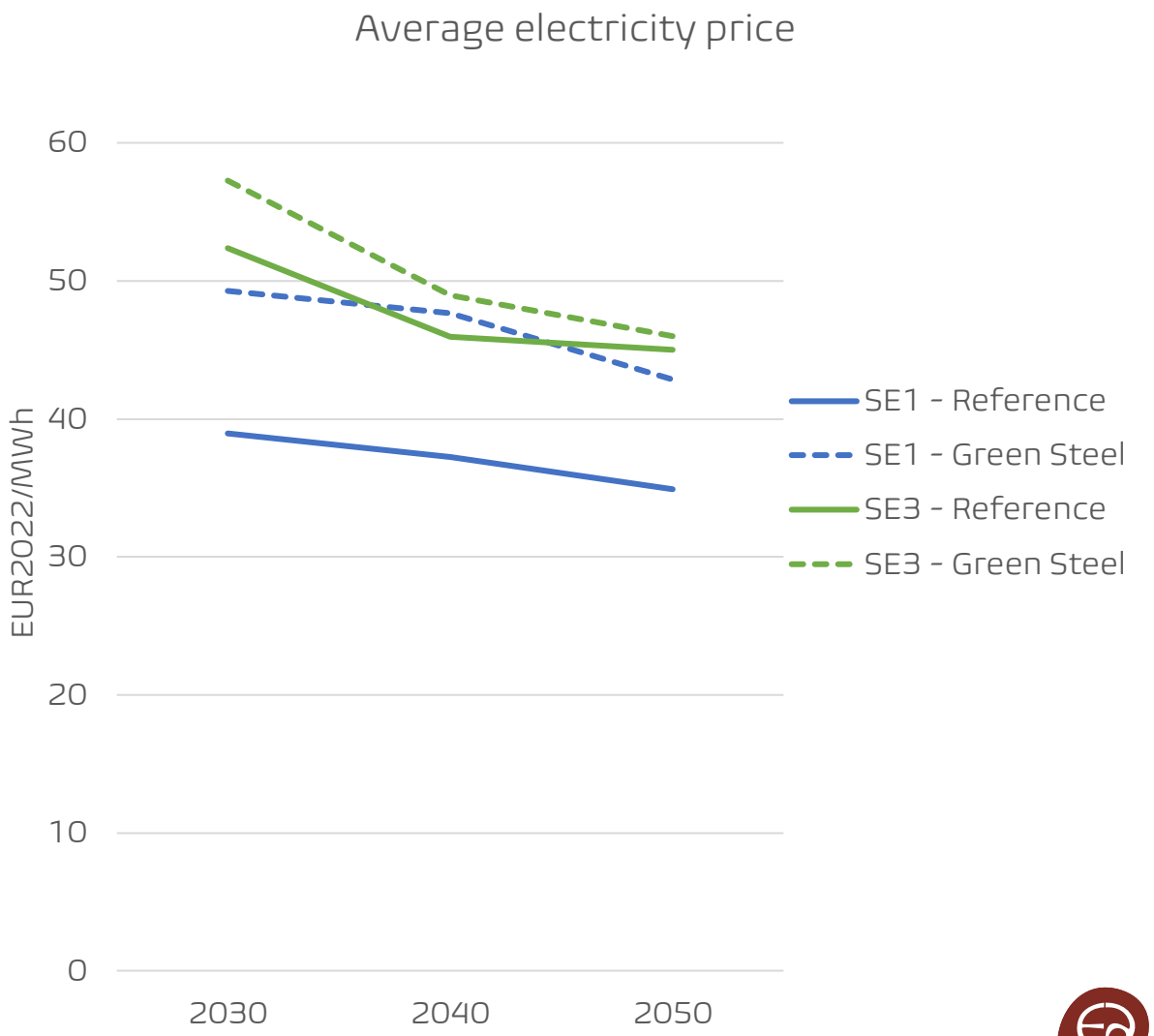

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