

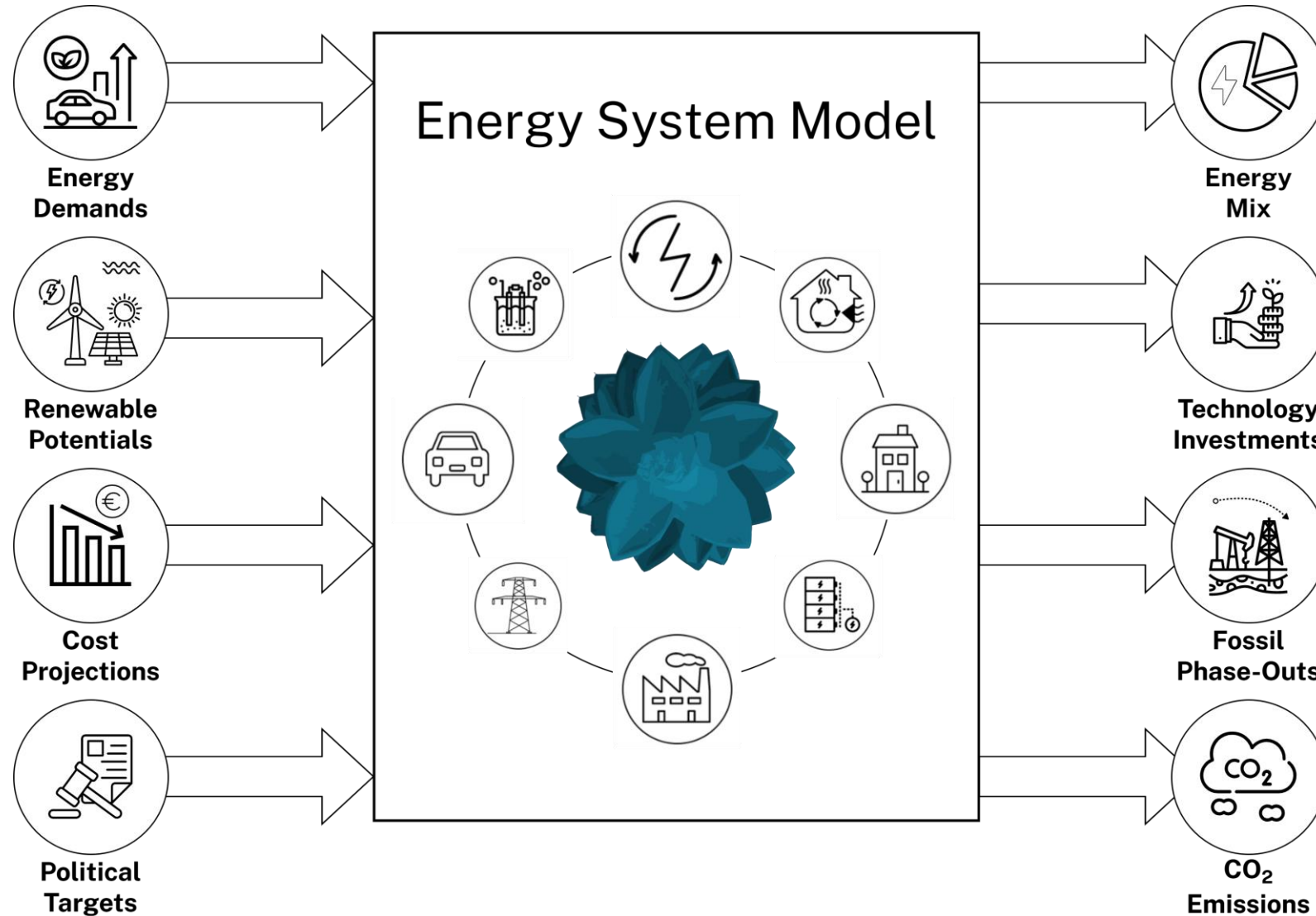
DNVA Workshop: The future of gas

Integrated energy system insights

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12.02.2024

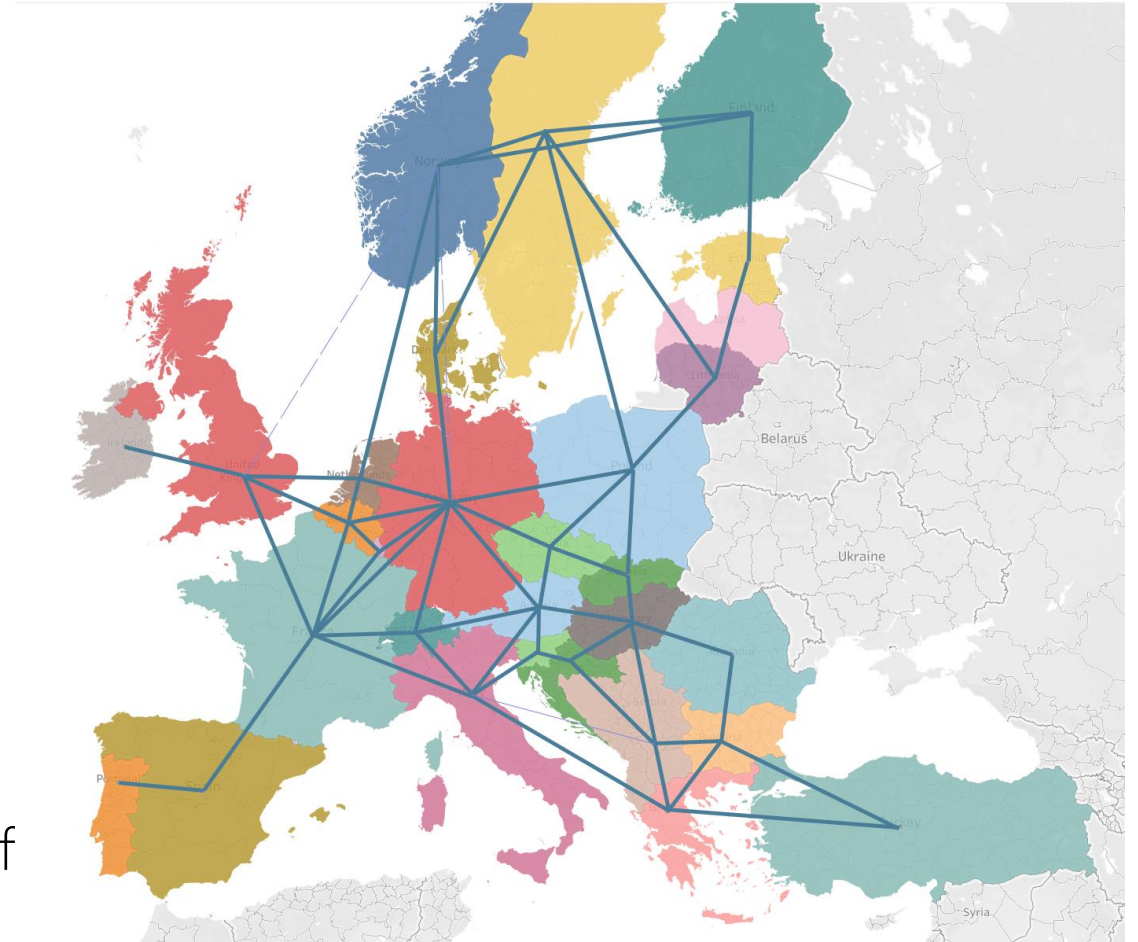


Using energy system analysis to gain insights in long-term effects



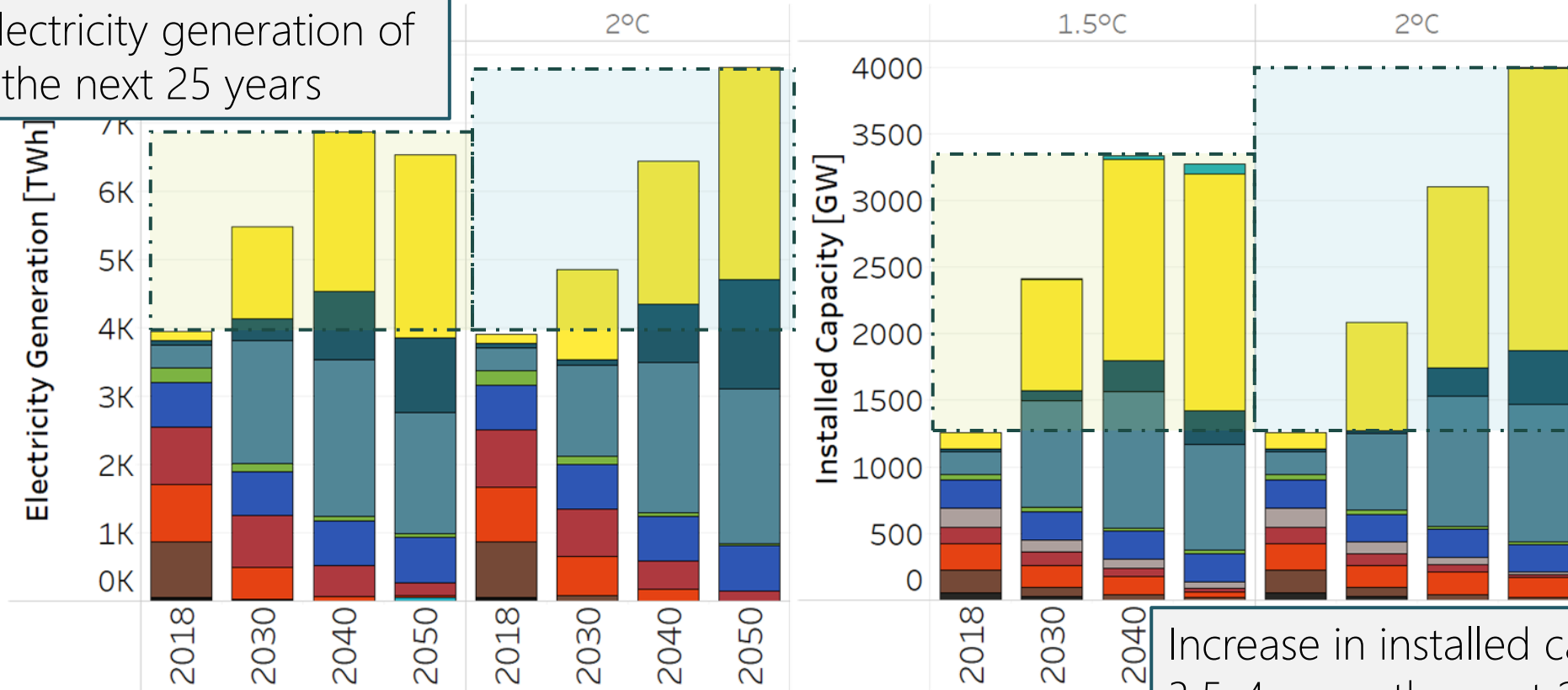
Outline of the model set-up

- Open-source energy system model GENE SYS-MOD
- 30 Regions (Mainland-EU, UK, Switzerland, Norway, Turkey, and the Balkan region)
- Modeled timeframe: 2018-2050
- Covers the sectors: Electricity, Buildings, Industry and Transportation
- Implementation of scenario-dependent features (like potential of demand shifting, political climate-targets, or breakthrough of certain technologies)



Drastic capacity increases are required – starting today

Increase in electricity generation of 1.75-2x over the next 25 years



Increase in installed capacity of 3.5-4x over the next 25 years

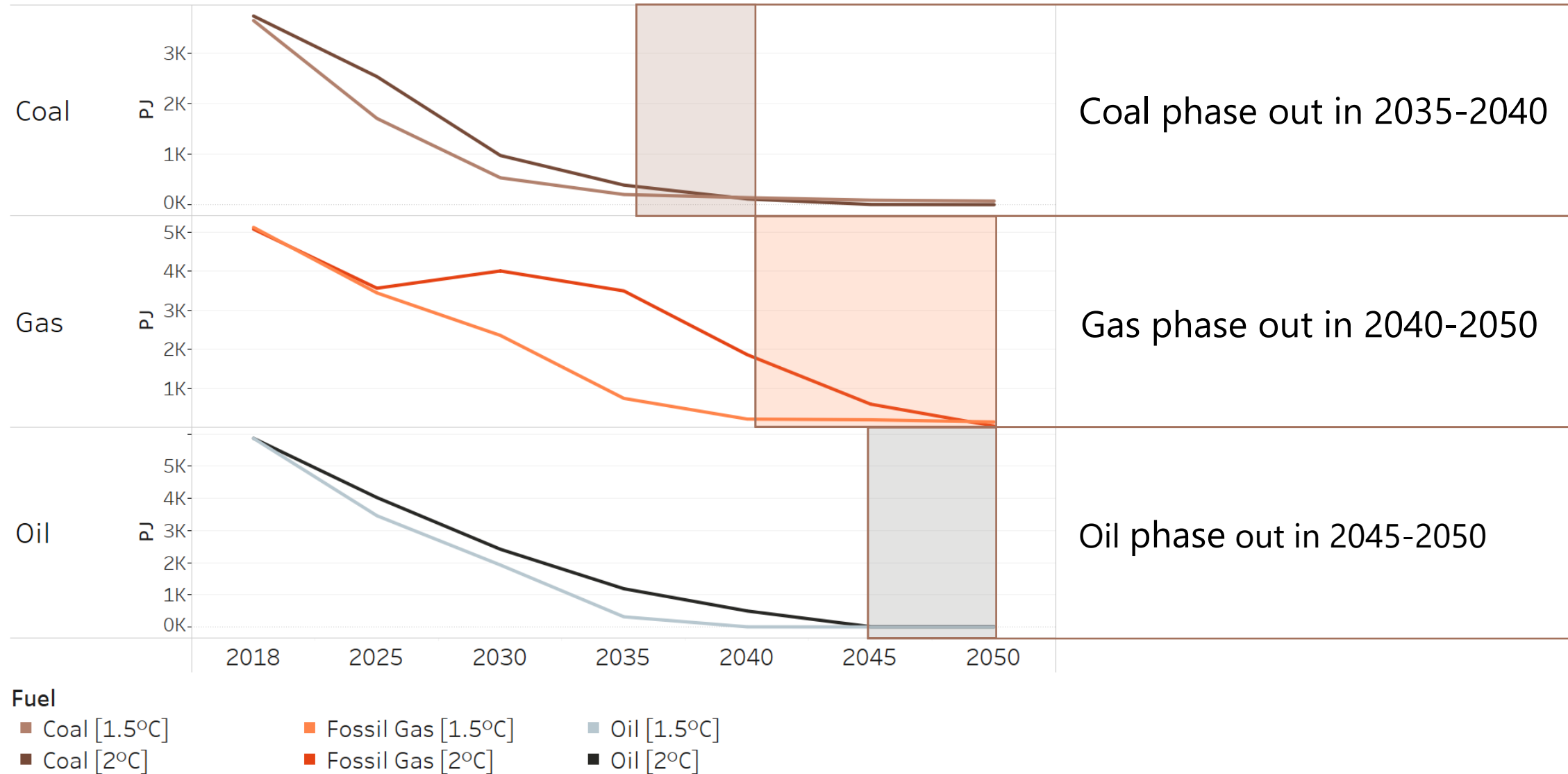
Technology

- Photovoltaics
- Wind [Offshore]
- Wind [Onshore]
- Biomass
- Hydropower
- Nuclear
- Gas [Fossil Gas]
- Gas [Syn. Gas]
- Coal
- Oil

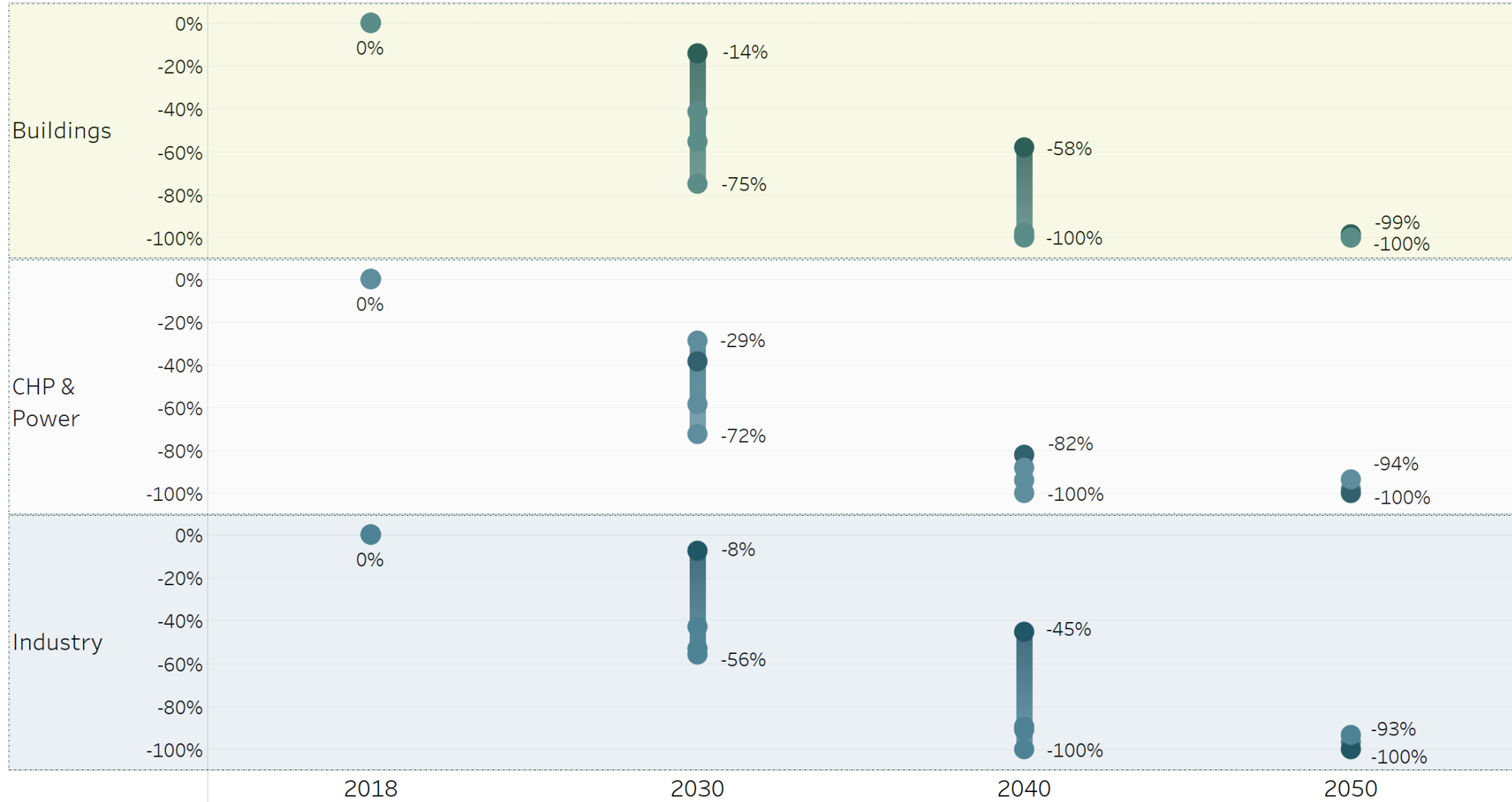
Technology

- Hydrogen
- Solar
- Wind Offshore
- Wind Onshore
- Biomass
- Hydro
- CHPs
- Nuclear
- Gas
- Coal
- Oil

Fossil fuel consumption needs to be reduced to zero within the next two decades



An outlook on the consumption of natural gas per energy sector



Conclusions

- To reach the ambitious climate targets of limiting global warming to 1.5-2°C, the energy system needs to be based on 100% renewables by 2040-2050
- With a strong focus on electrification as a sector-coupling option, this leads to a significant increase in variable renewable generation, together with a phase-out of fossil fuels
- In some difficult-to-decarbonize sectors, there will be a shift towards hydrogen, but the window for blue hydrogen using CCS is rapidly closing



Thank you for your attention

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🦊 <https://git.tu-berlin.de/genesysmod>





Backup Slides

Model Results – Electrification Rate & Electricity Generation

