

EU 2050 decarbonisation scenarios and lessons learned from the German coal phase-out process

Translating the European Green Deal into long-term decarbonisation alternatives; Webinar 06.11.2020



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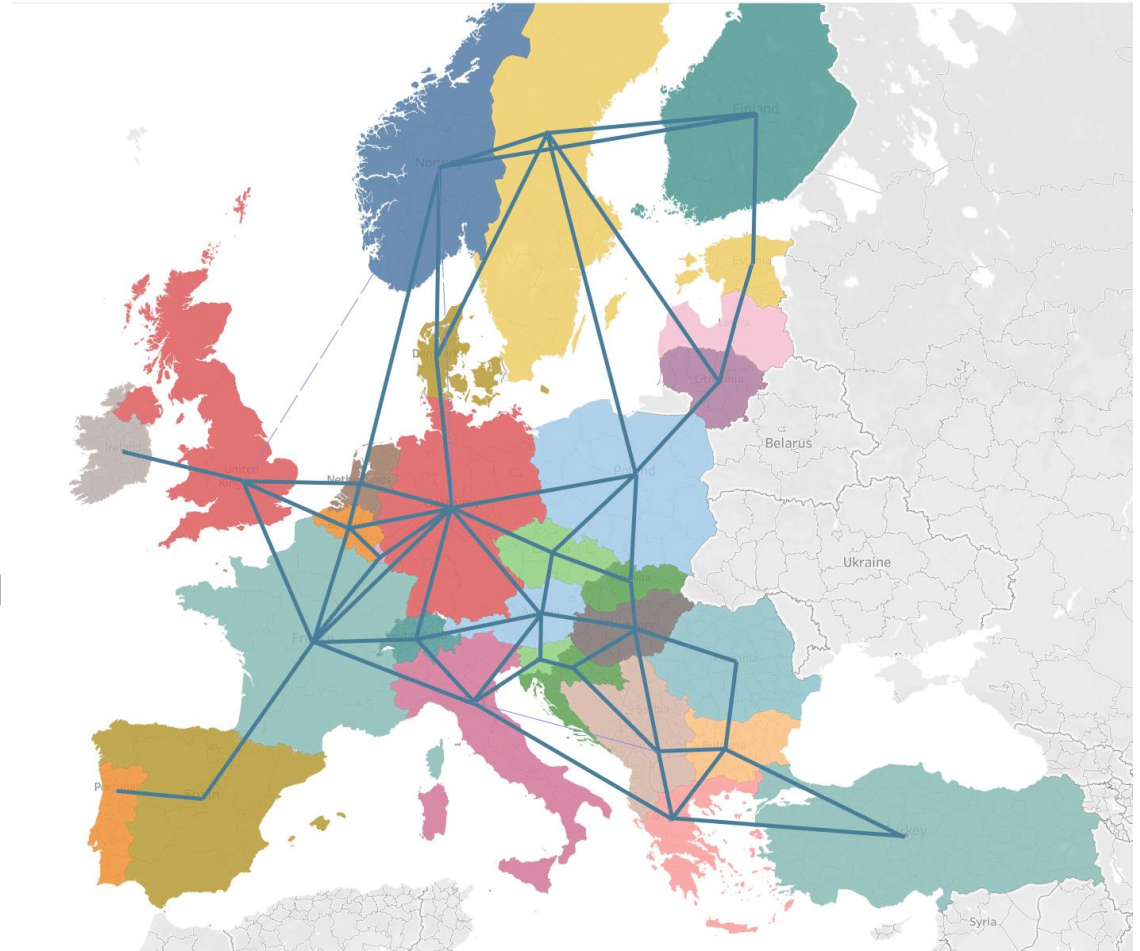
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Model setup and specifications of GENeSYS-MOD

- **30 Regions (Mainland-EU, UK, Switzerland, Norway, Turkey, and the Balkan region)**
- **Years 2015-2050 in five year steps**
- **Hourly resolution with time-clustering algorithm**
- **Sectors: Electricity, Buildings, Industry and Transportation**
- **Pathway dependent features (like potential of demand shifting, political climate-targets, or breakthrough of certain technologies)**



GENeSYS-MOD v2.9.0-oE

Imagining different decarbonization scenarios for Europe



Directed Transition

- Strong policy push

Societal Commitment

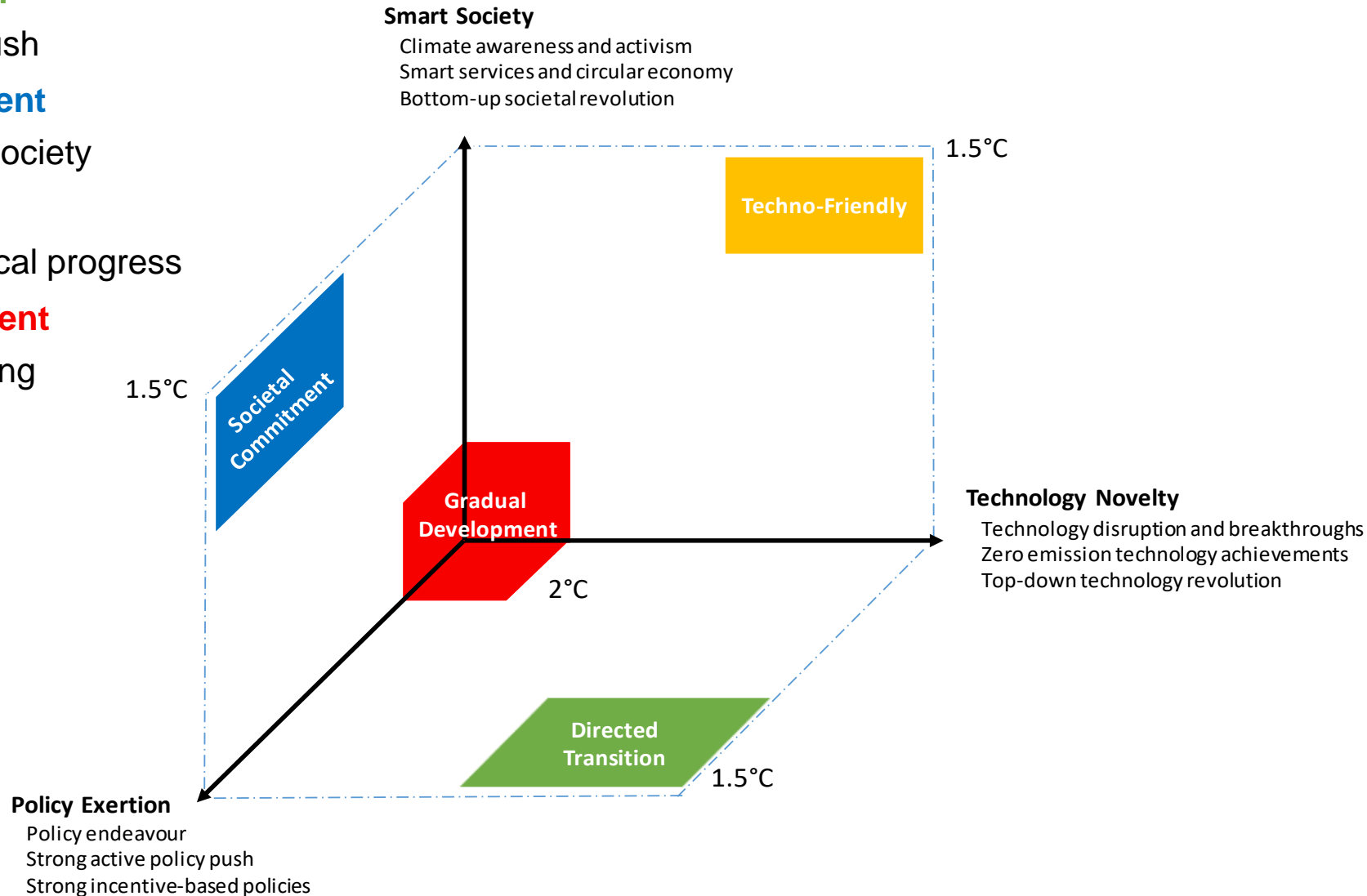
- Willingness of Society

Techno-Friendly

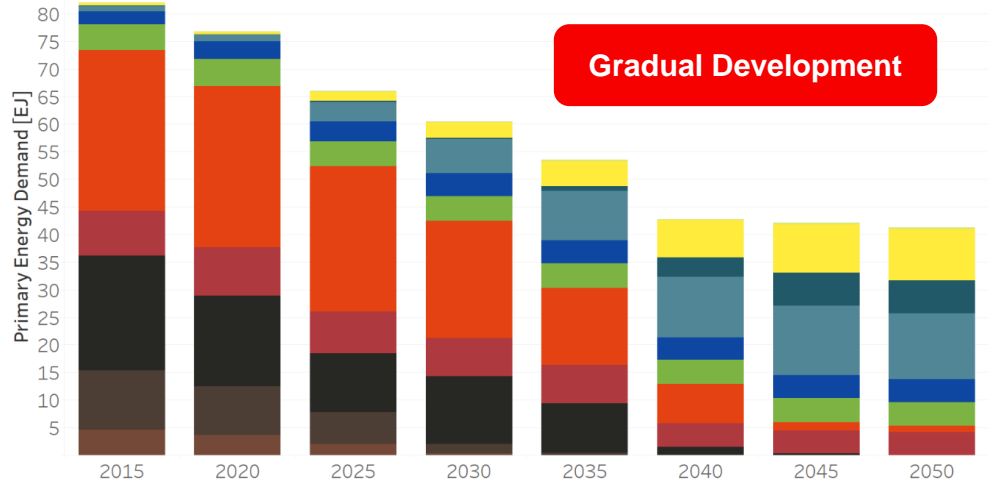
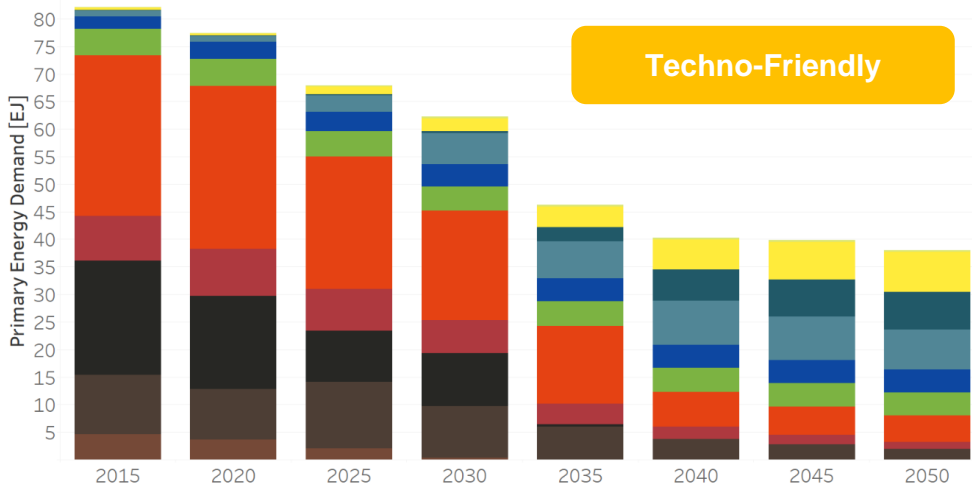
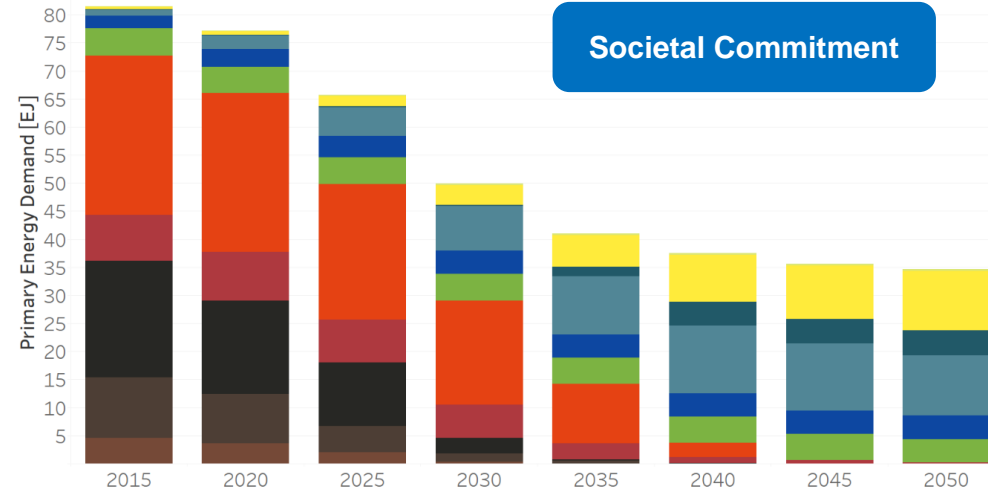
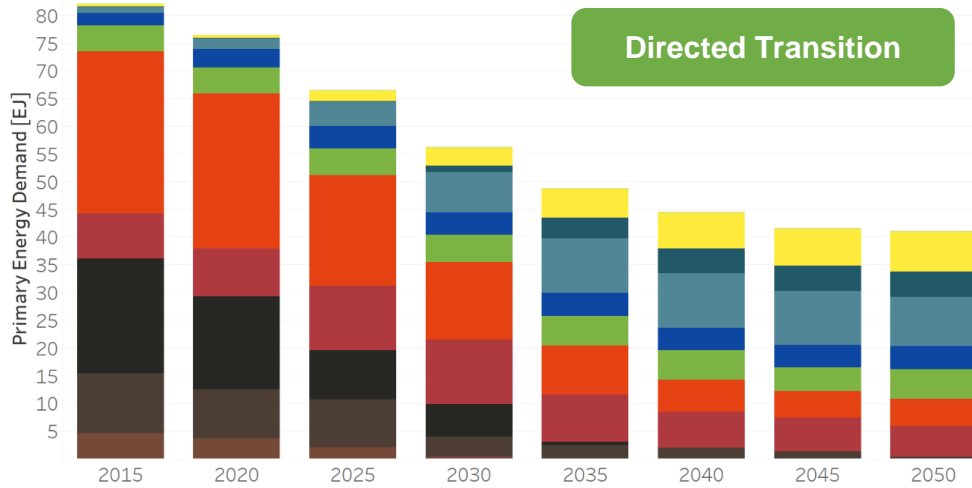
- High technological progress

Gradual Development

- Little of everything



In pathways without CCS or other negative emission technologies, 100% renewables are a must-have



Energy Carrier

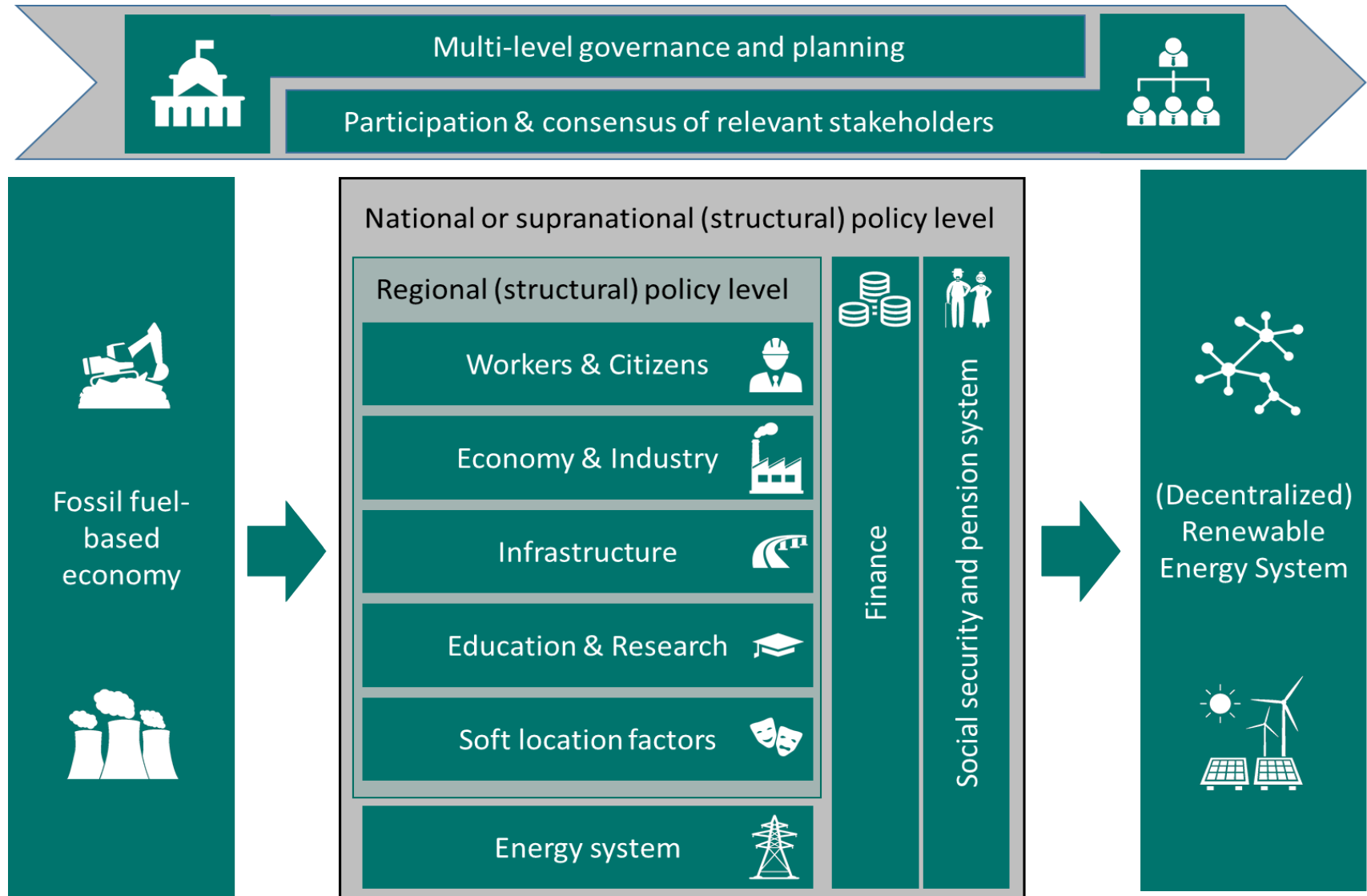
- Other RES
- Wind [Offshore]
- Hydro
- Nat. Gas
- Oil
- Lignite Coal
- Photovoltaics
- Wind [Onshore]
- Biomass
- Nuclear
- Hard Coal

The German 'coal commission's' decision in January 2019

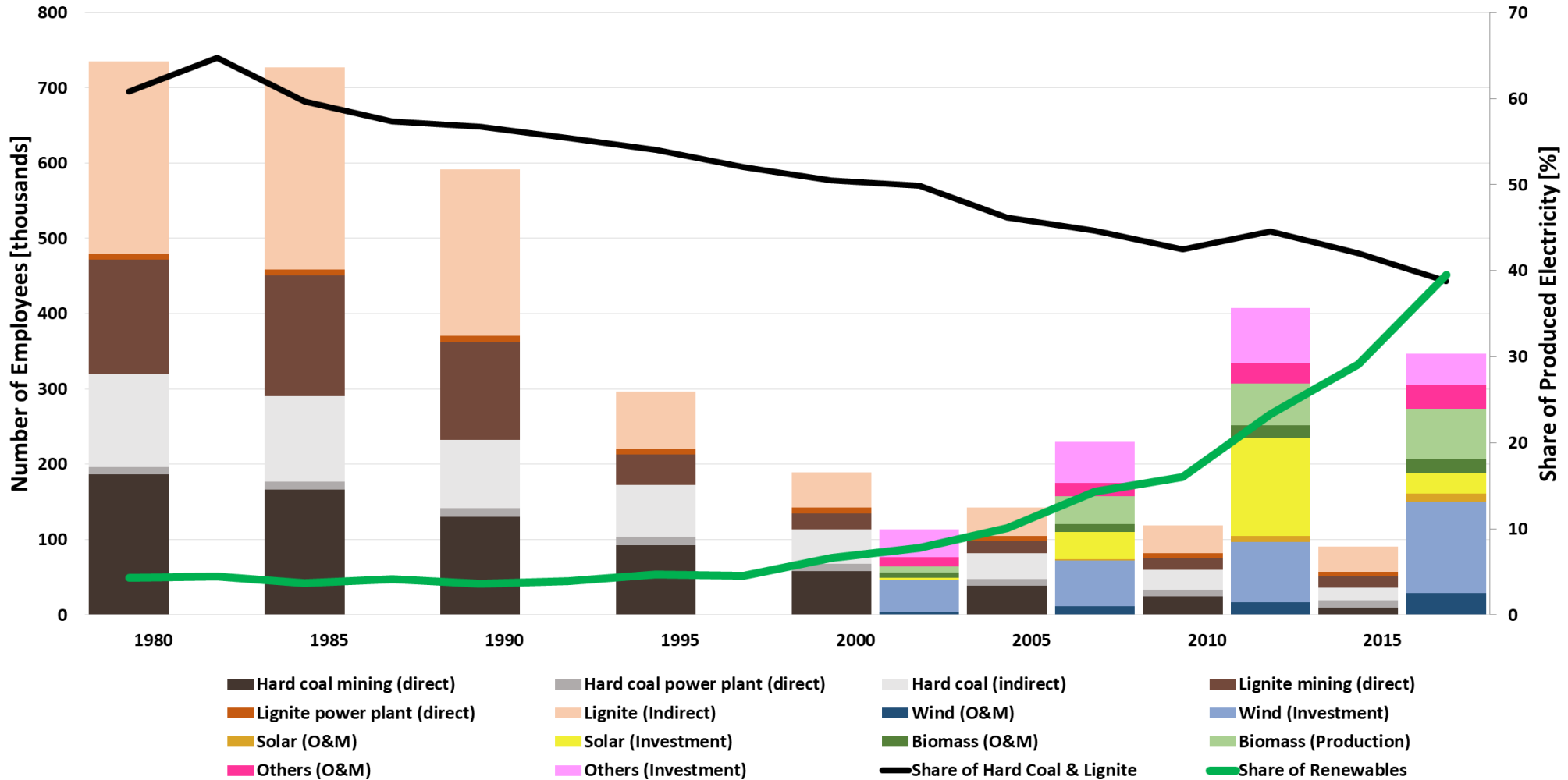
- 12.5 GW of coal capacity will go offline by 2022, only 17GW remain by 2030 (of currently ~42 GW)
- Phase-out date 2038 with option of early phase-out by 2035
- A total of €40 billion in transition measures in German coal regions for next 20 years
- Costs and conditions for compensating utilities subject to negotiations with the government
- Confirming target of 65% renewable electricity production by 2030



The energy system is just one element of a 'just transition'



Coal and Renewables in Germany since 1980



Source: Oei et al. (2020).

Kick-off of Discussions: Main Findings

Different pathways towards climate neutrality exist



All of them imply a timely CoalExit (ideally by 2030 in Europe)



There is no room / need for additional fossil gas investments



100% renewable energy supply is the cheapest technological solution



Different challenges prevail for countries and regions to enable a Just Transition

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