



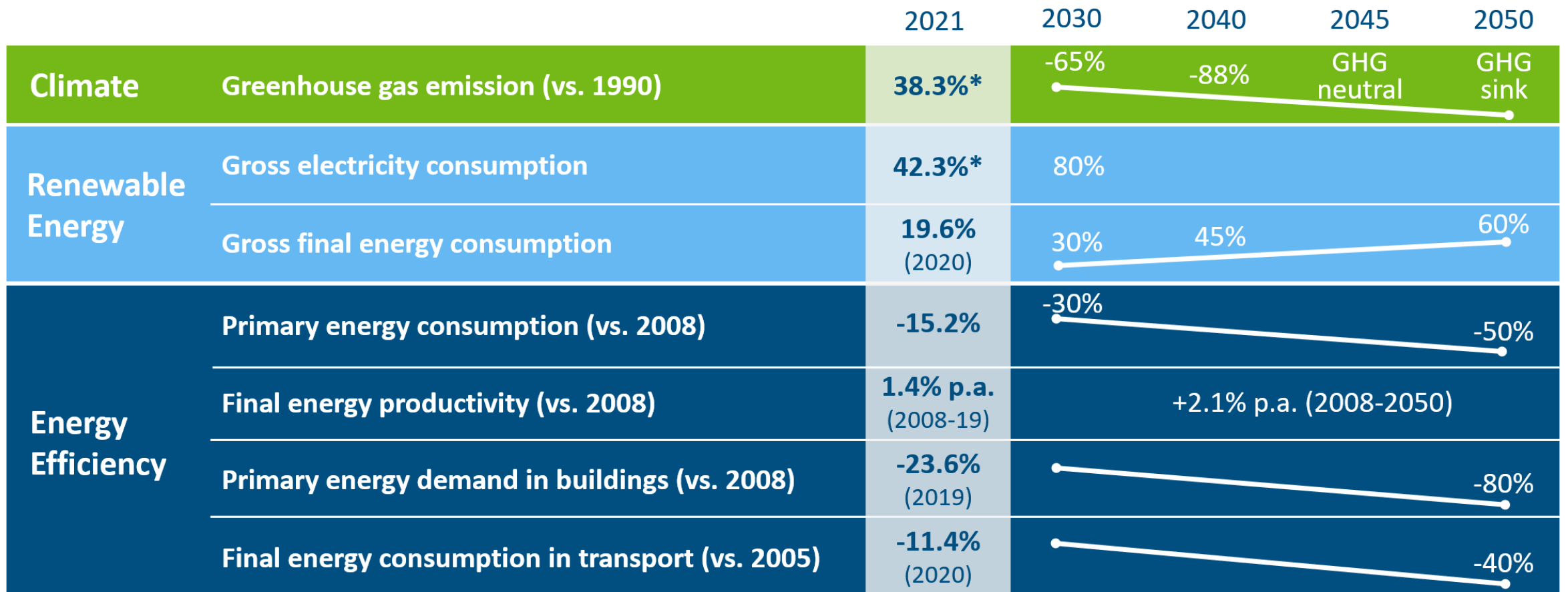
Energiewende (Energy Transition) in Germany and Learnings for India



Implemented by



The Energiewende is Germany's long-term energy and climate strategy

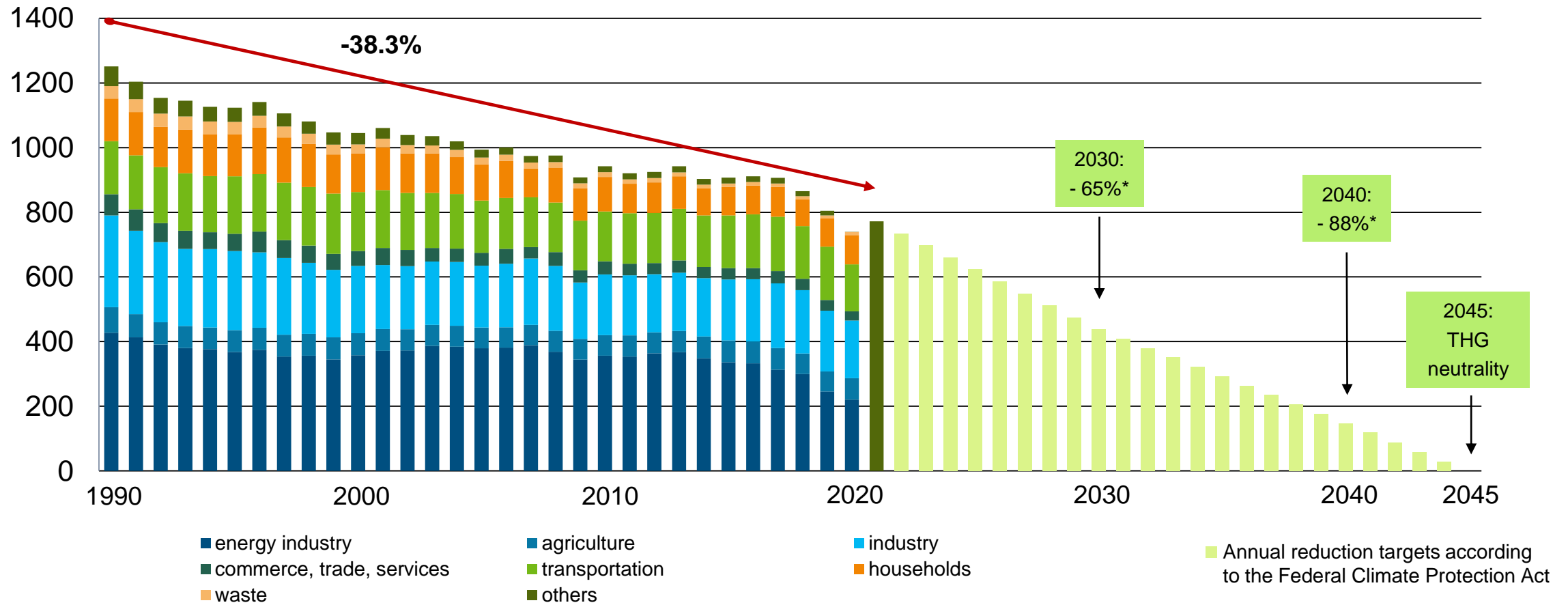


* Preliminary data

Source: Guidehouse 2022 based on Agora Energiewende 2022 & BMWK 2021

Germany is reducing its emissions, but more action is needed

Greenhouse gas emissions and reduction targets in Germany

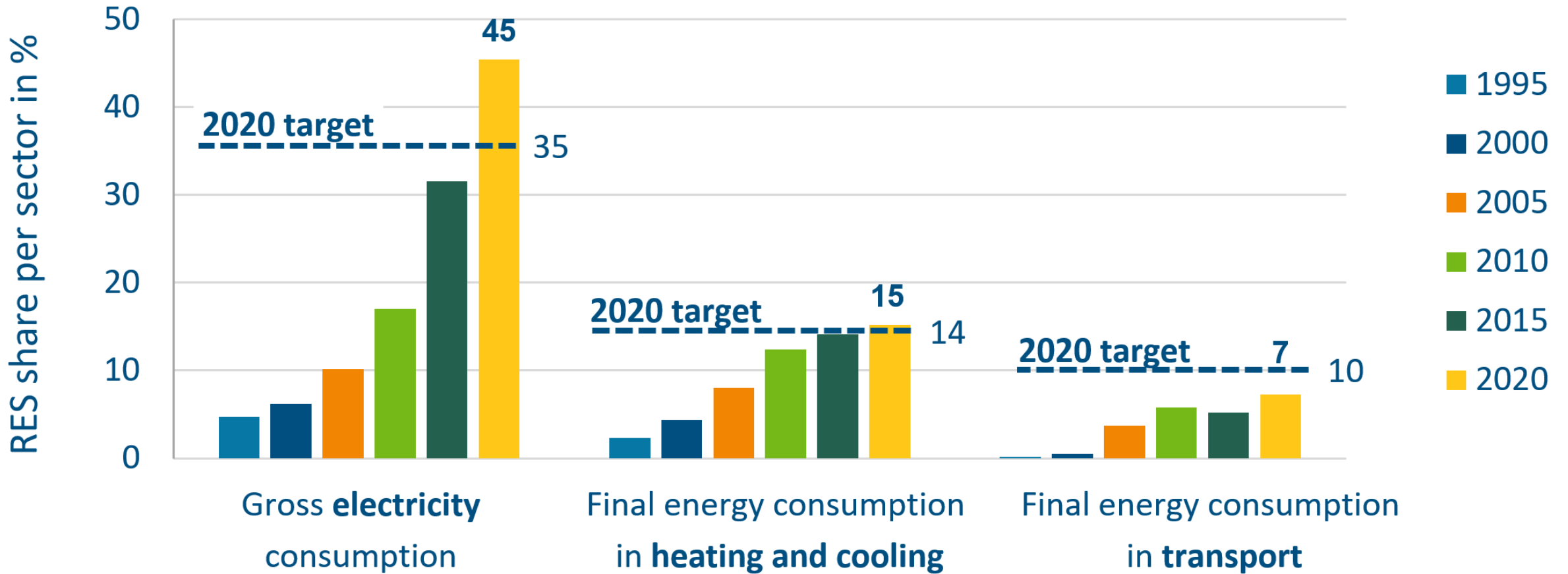


*Greenhouse gas reduction compared to 1990

Source: Guidehouse 2022 based on BMWK 2022, UBA 2021 & Agora 2021

Germany surpassed its sectoral renewables targets in electricity and heating & cooling but fails for transport

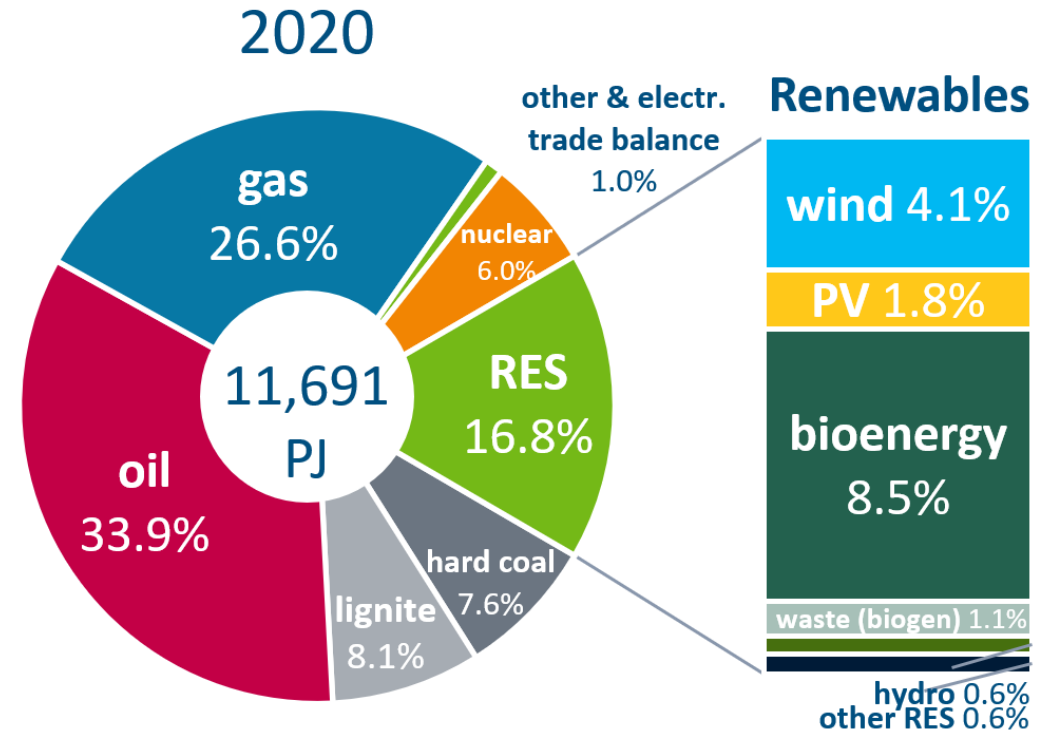
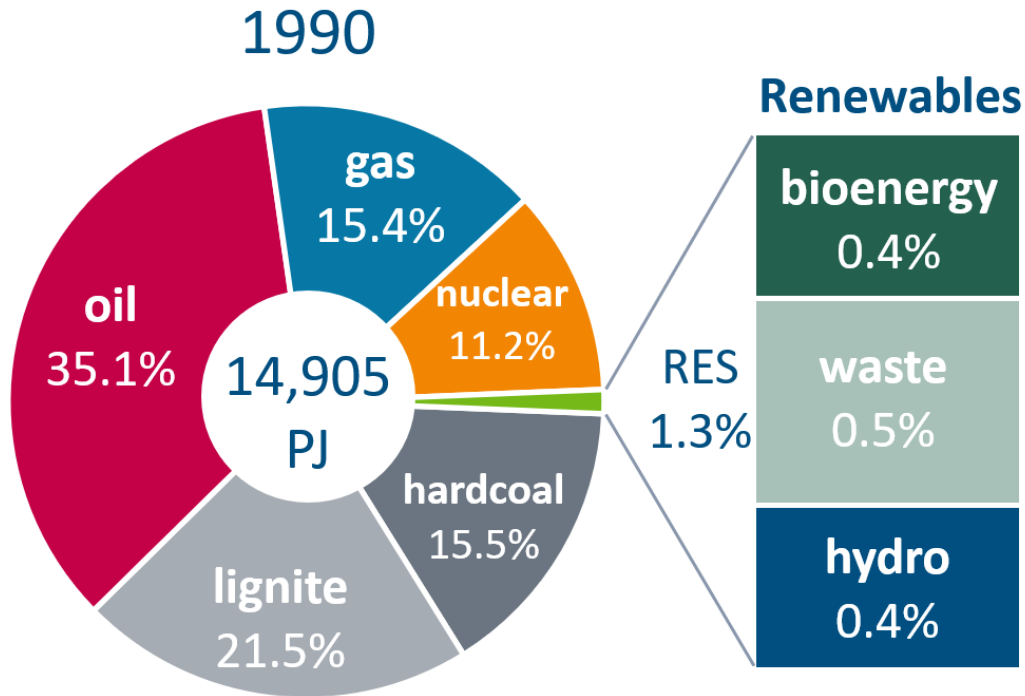
Share of renewable energy sources (RES) per sector in Germany



Source: Guidehouse 2021 based on BMWK 2020 & AGEE-Stat 2016

Wind, solar PV and biomass have driven the growth of renewables in primary energy consumption

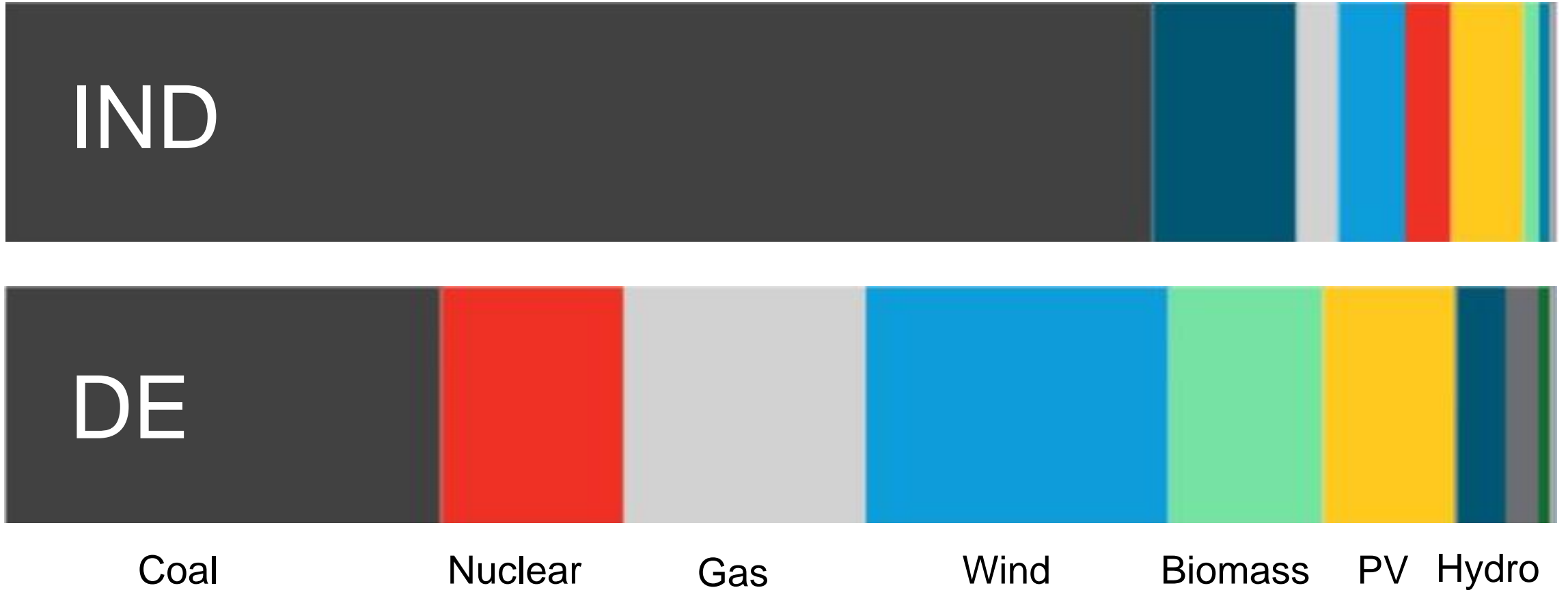
Primary energy consumption by energy sources in Germany



Source: Guidehouse 2021 based on AGEB 2021

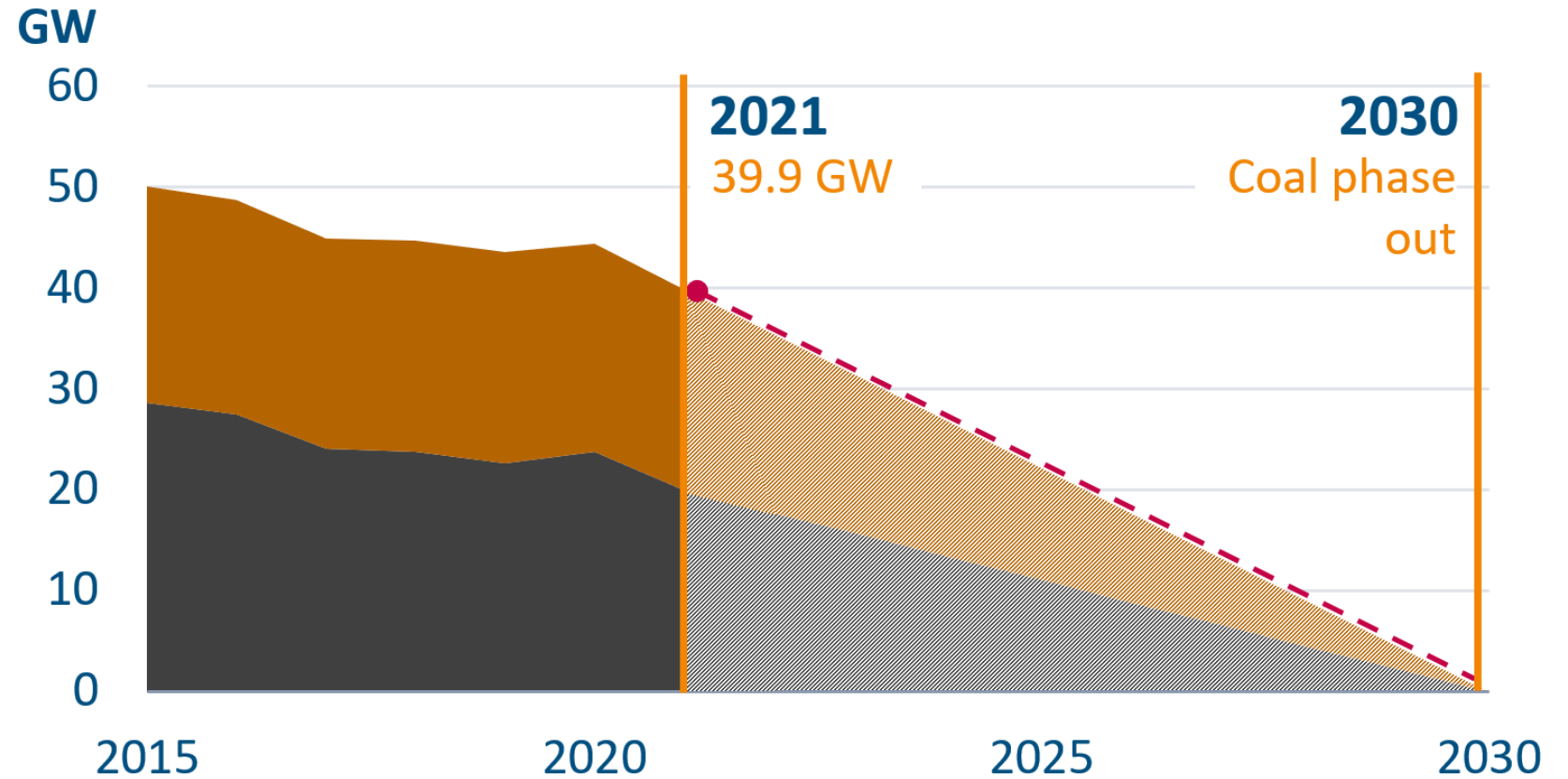
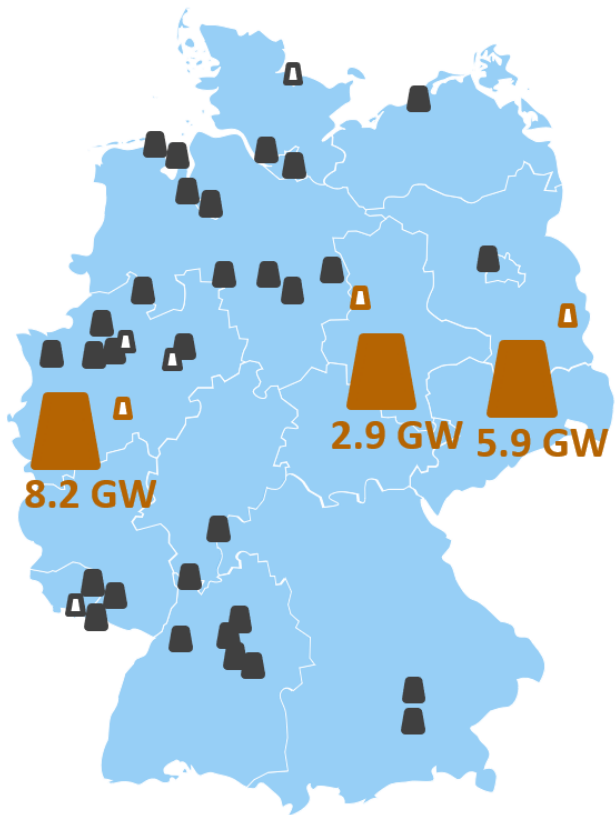
Electricity Mix India and Germany (2020)

Share of GWh electricity generation in total mix (in %)



Source: MoP 2021, CEA 2021, BNEF 2021

Germany phase out coal by 2030



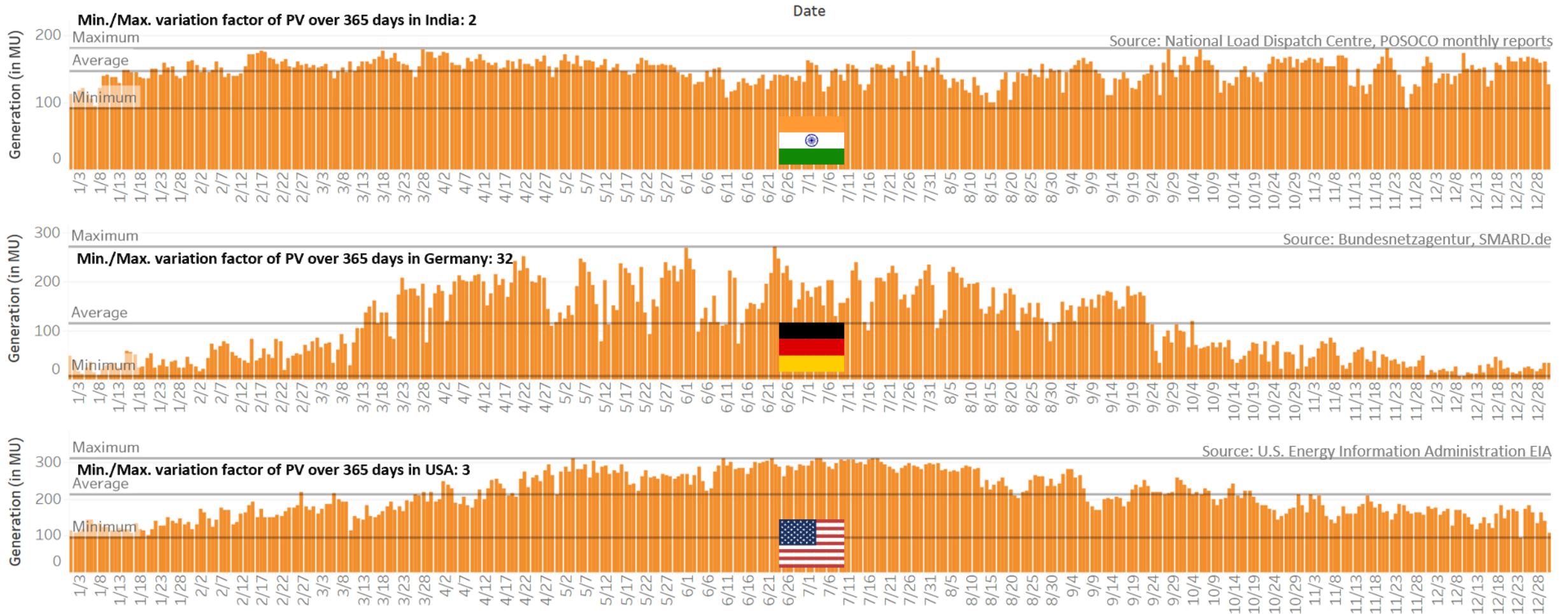
Net installed capacity



Target for remaining coal capacity

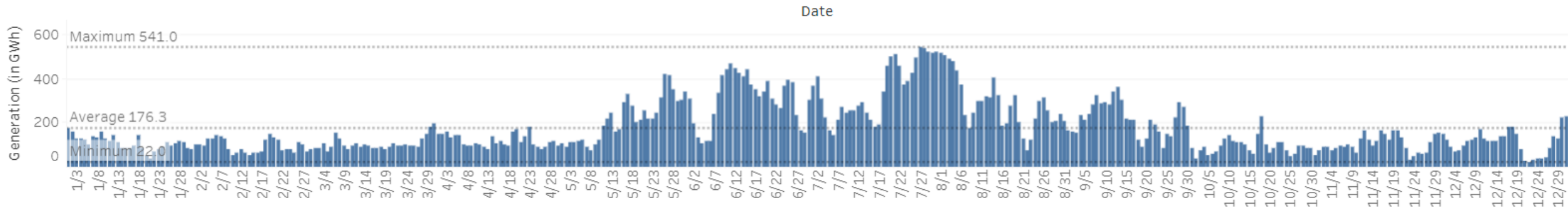


365 Days of Solar Generation in India, Germany and the US in 2020



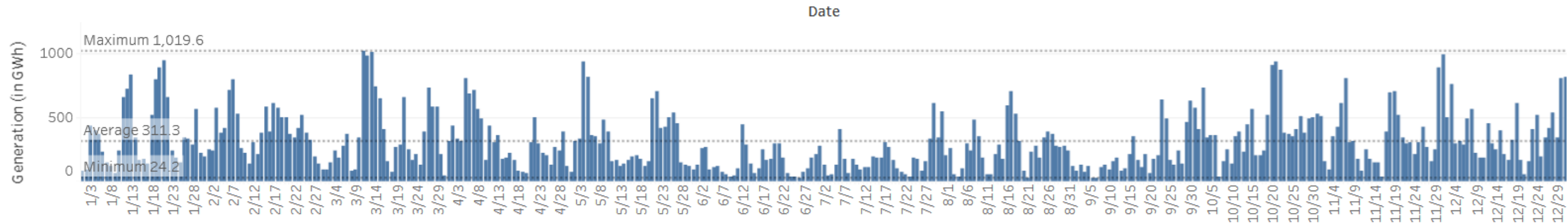
365 Days of Wind Generation in India and Germany in 2020

India



Source: National Load Despatch Centre, POSOCO monthly reports

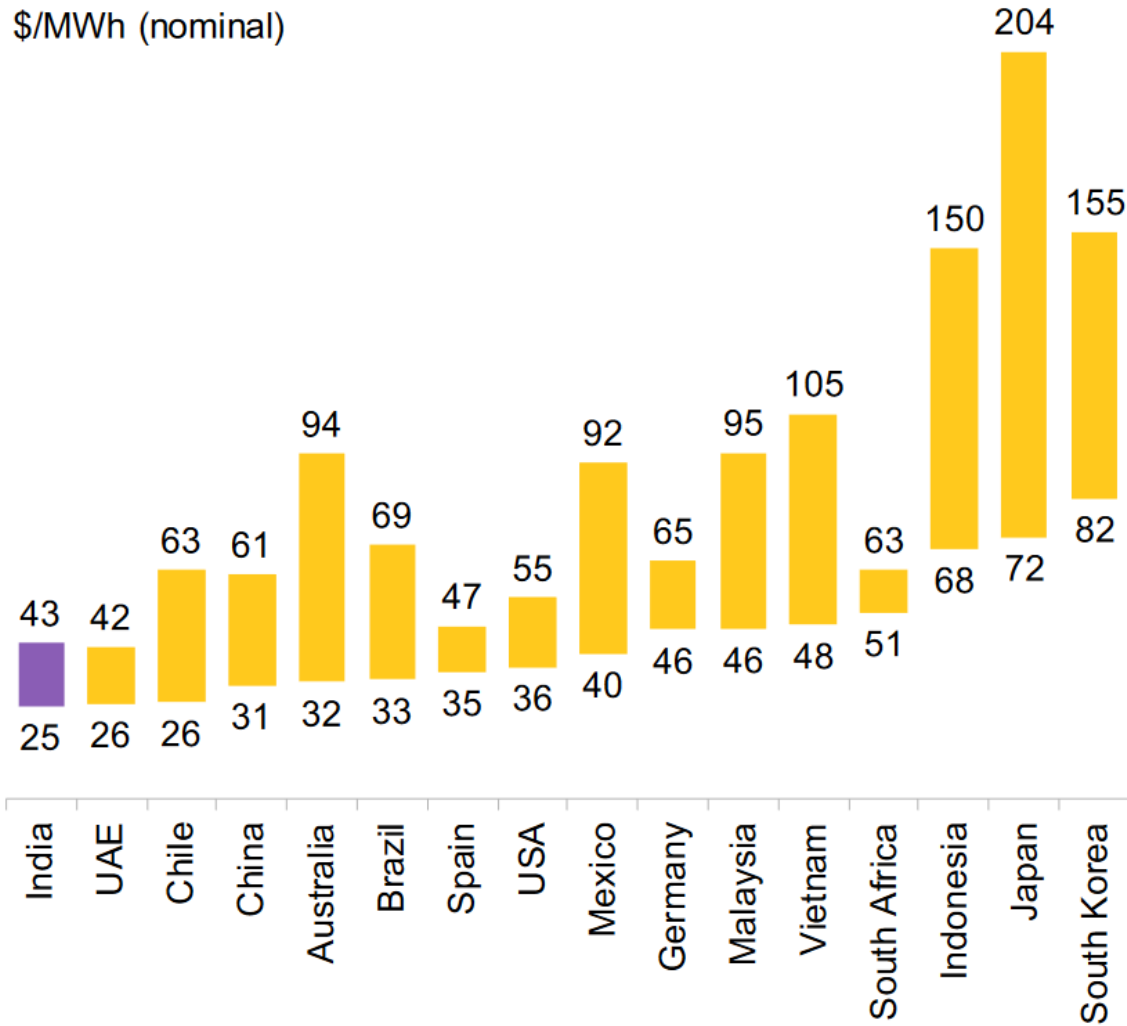
Germany



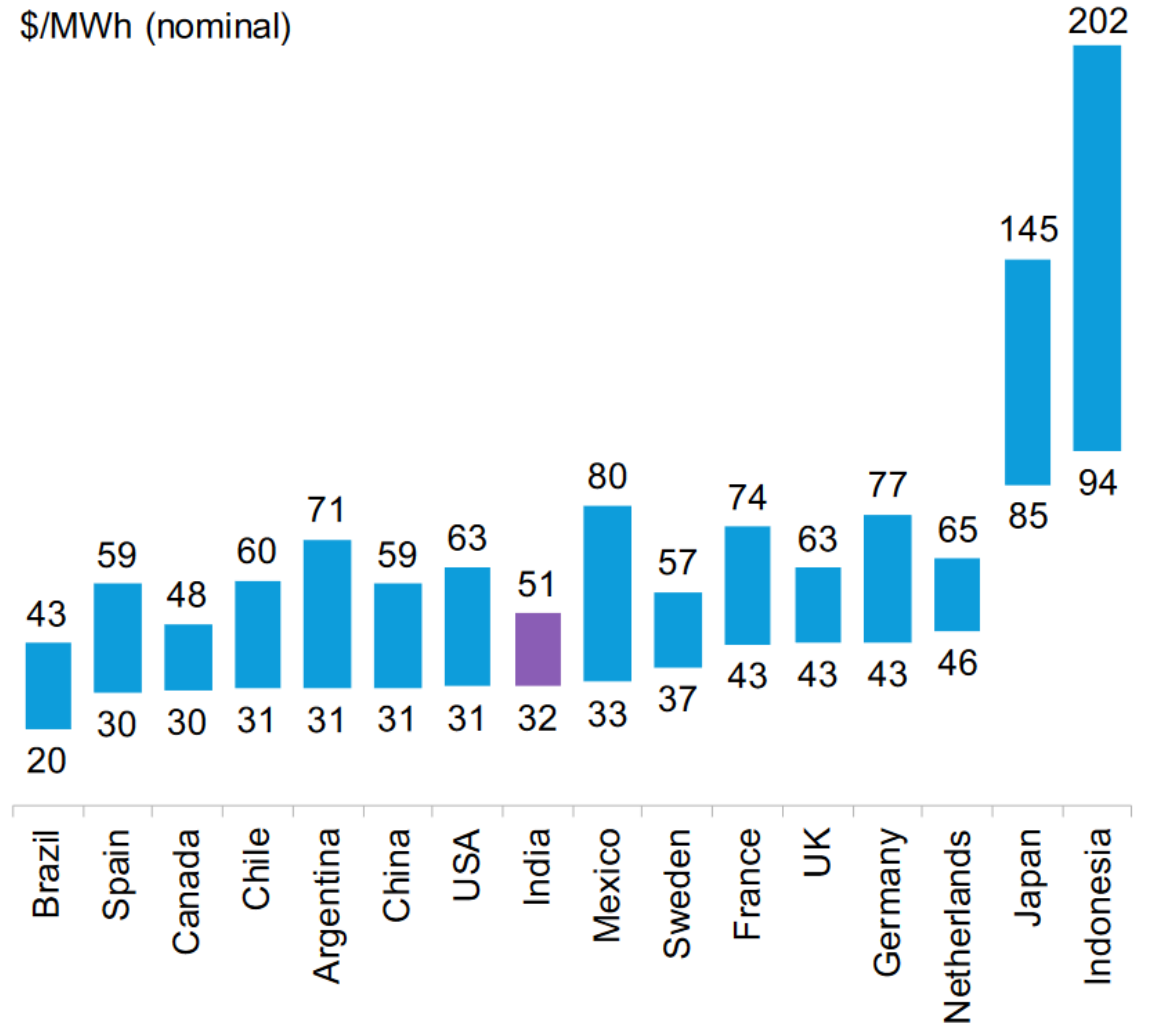
Source: Bundesnetzagentur, SMARD.de

LCOE comparison for Fixed-Axis PV and Onshore Wind, 2021

\$/MWh (nominal)

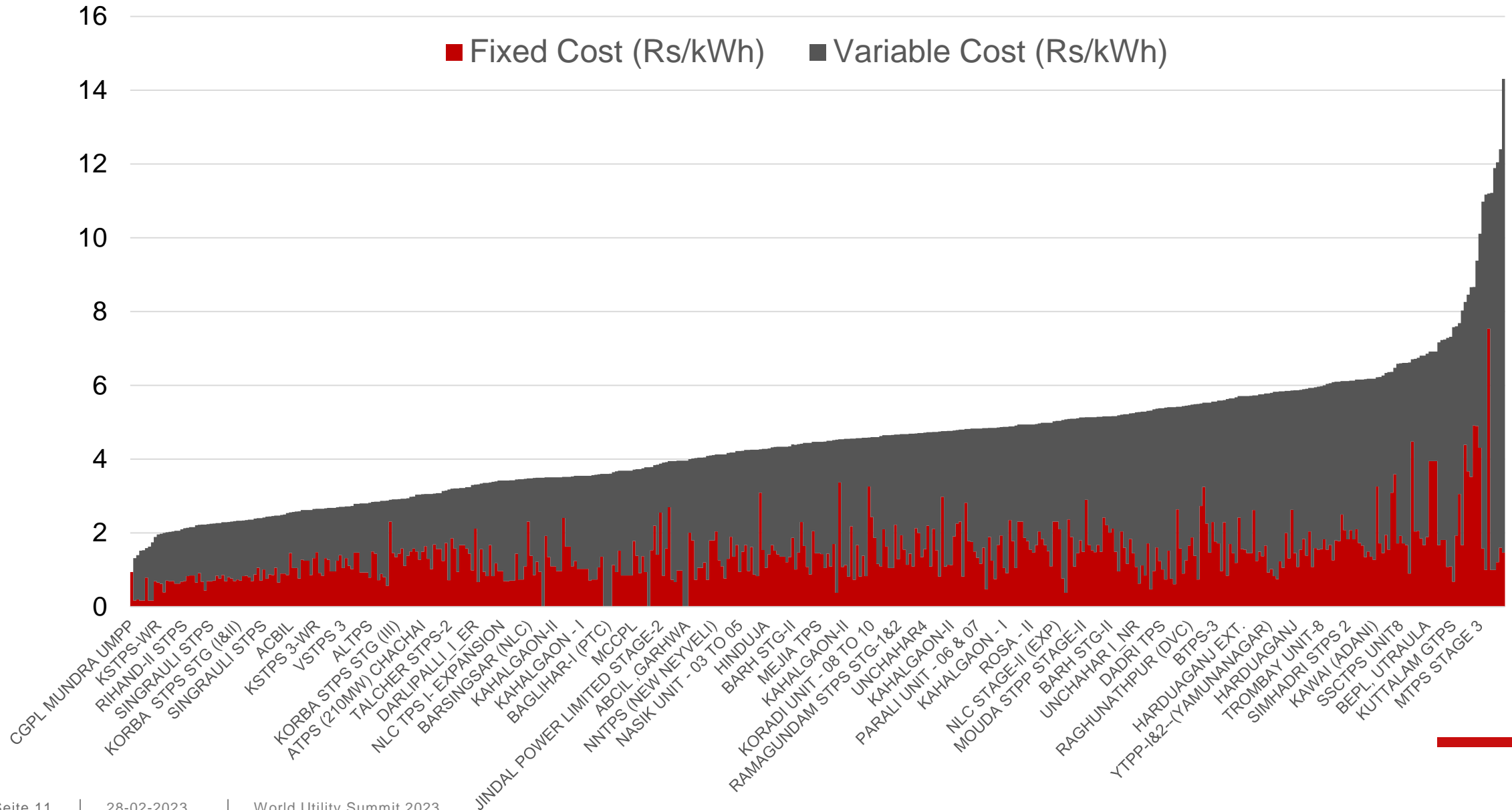


\$/MWh (nominal)



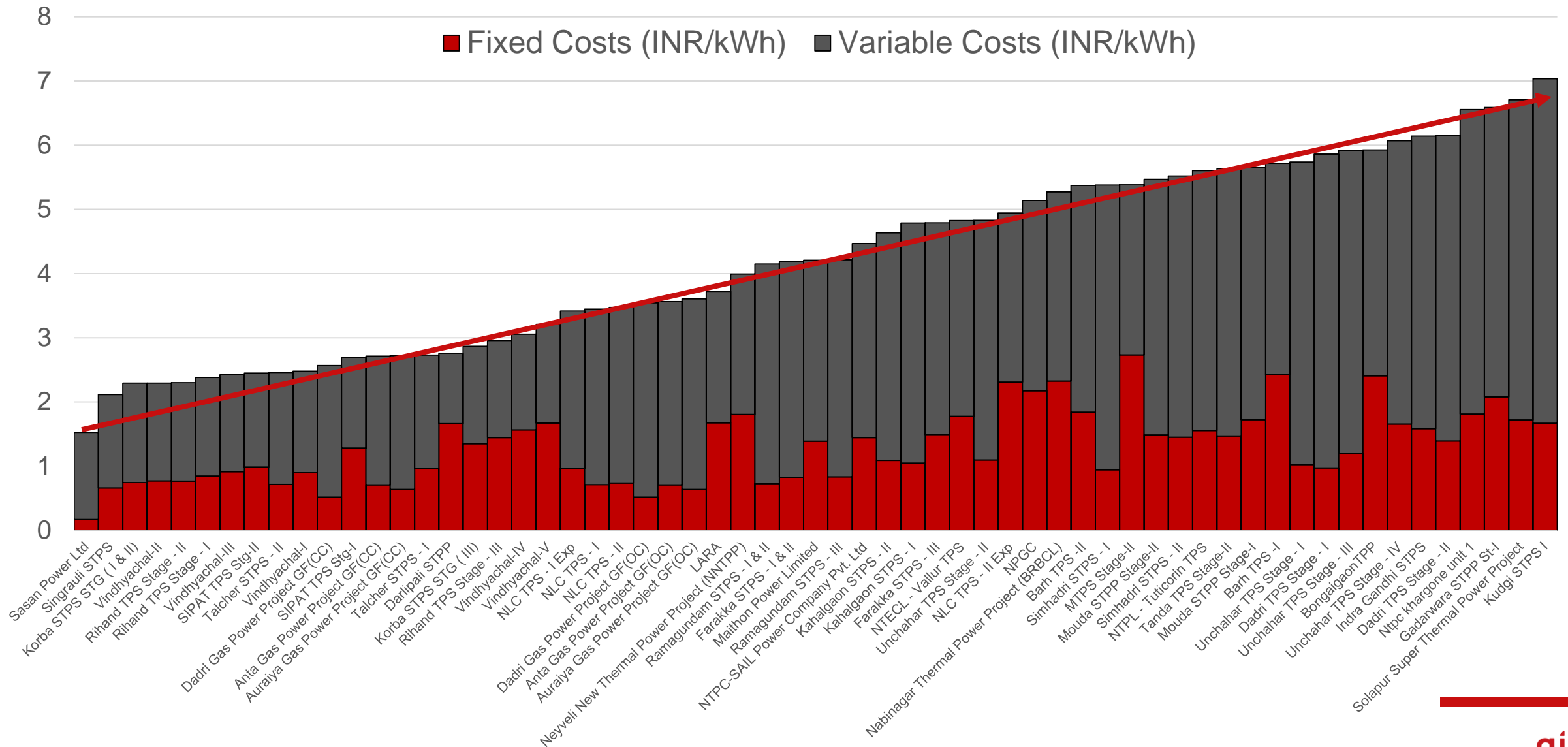
Source: [Power Foundation of India](#)

Merit Order of Coal Generation in India in January 2023 (INR/kWh)



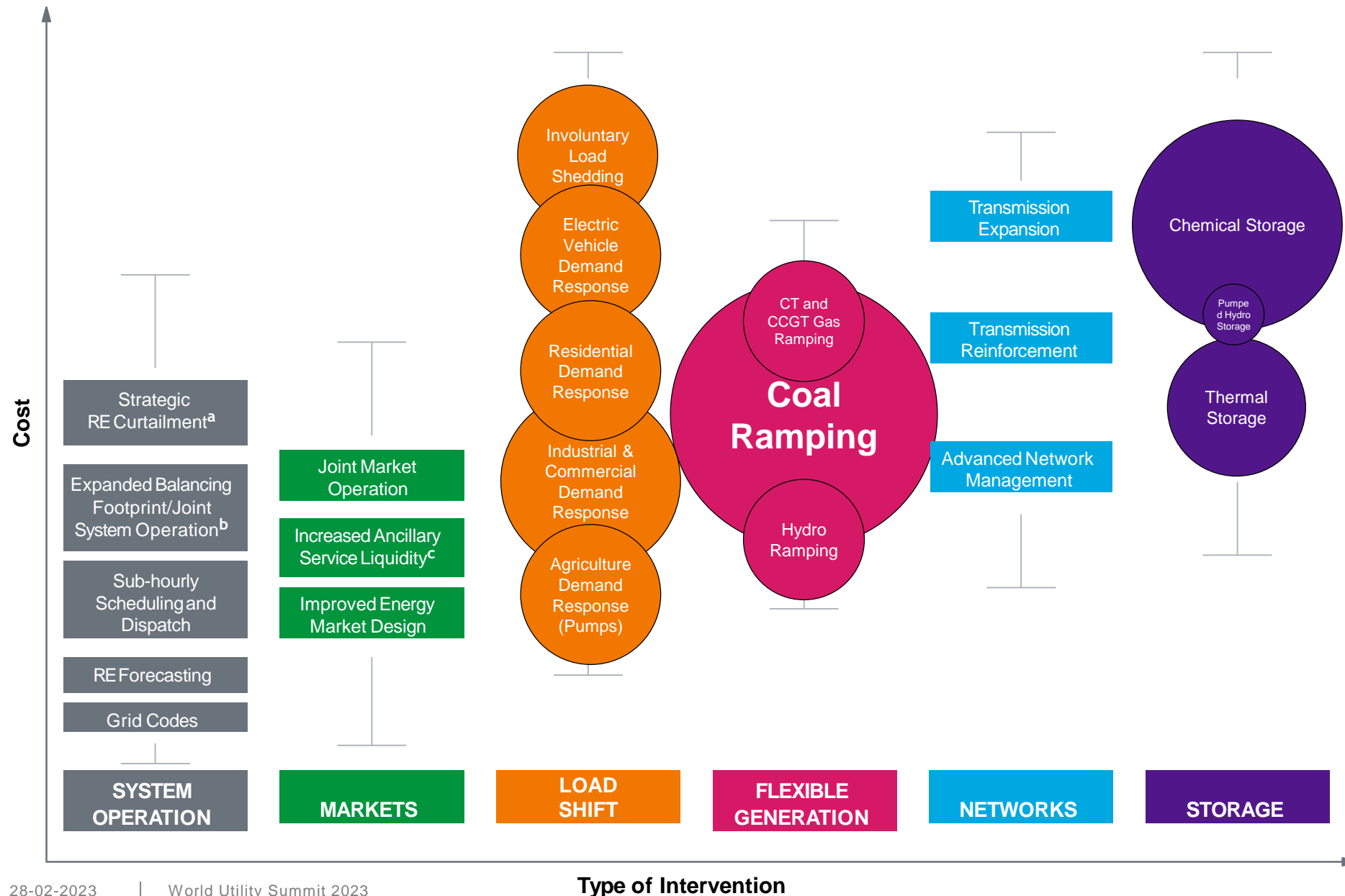
Source: MERIT India, own visualisation

Merit Order of RRAS Providers in February 2023 (in INR/kWh)

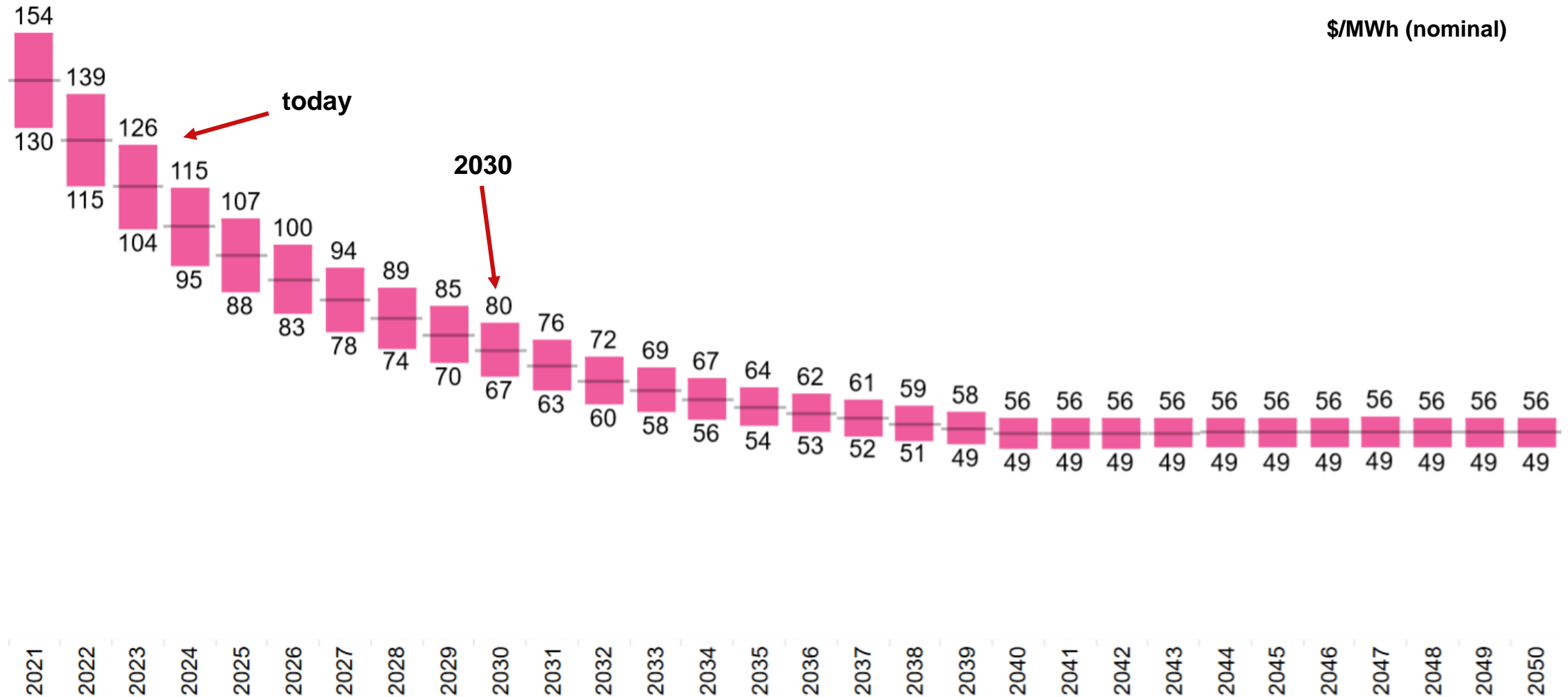


Source: <https://posoco.in/reports>, own visualisation

Relative Economics of Fluctuating RE-Integration Options in India



Cost Development of 4h-Battery Storage in India in USD/MWh



Source: BNEF 2020

Thank You



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