

# SuperGrid and Hydrogen Infrastructure

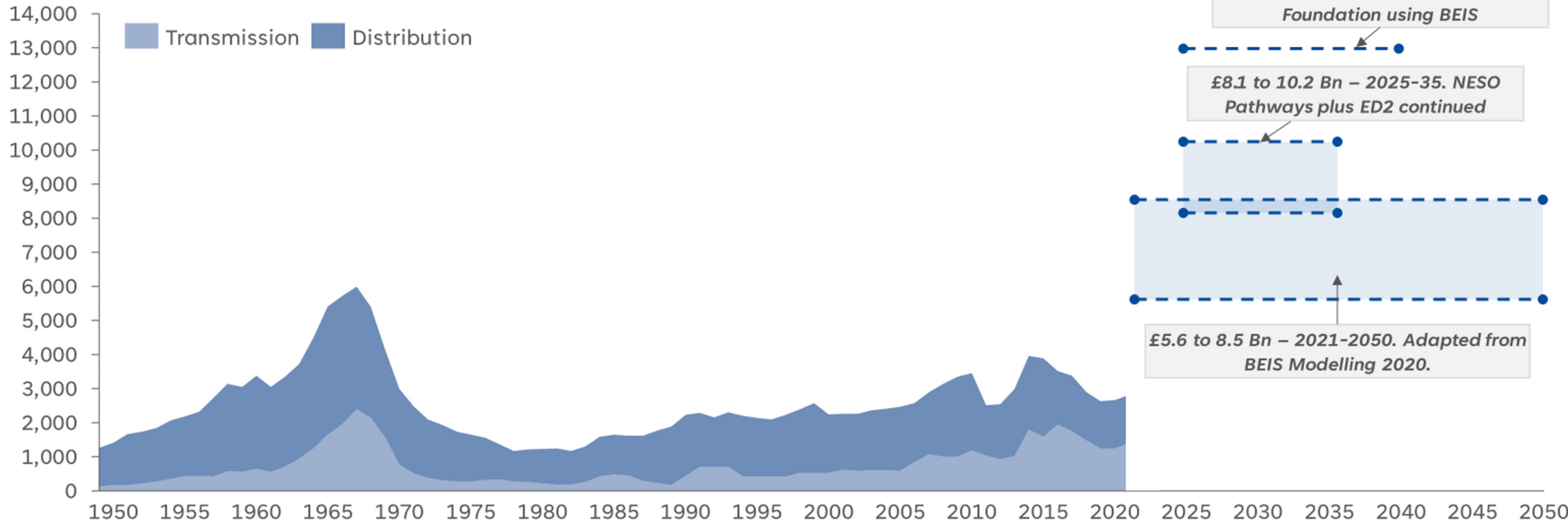
EPRG conference - May 2024



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# The Bowwave of Network Capex in historical perspective - *Electricity*

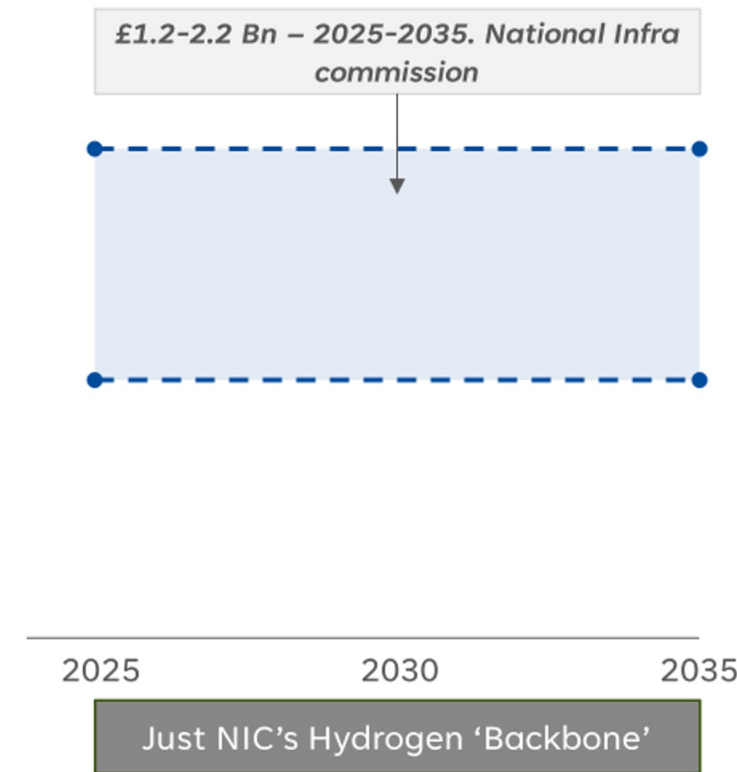
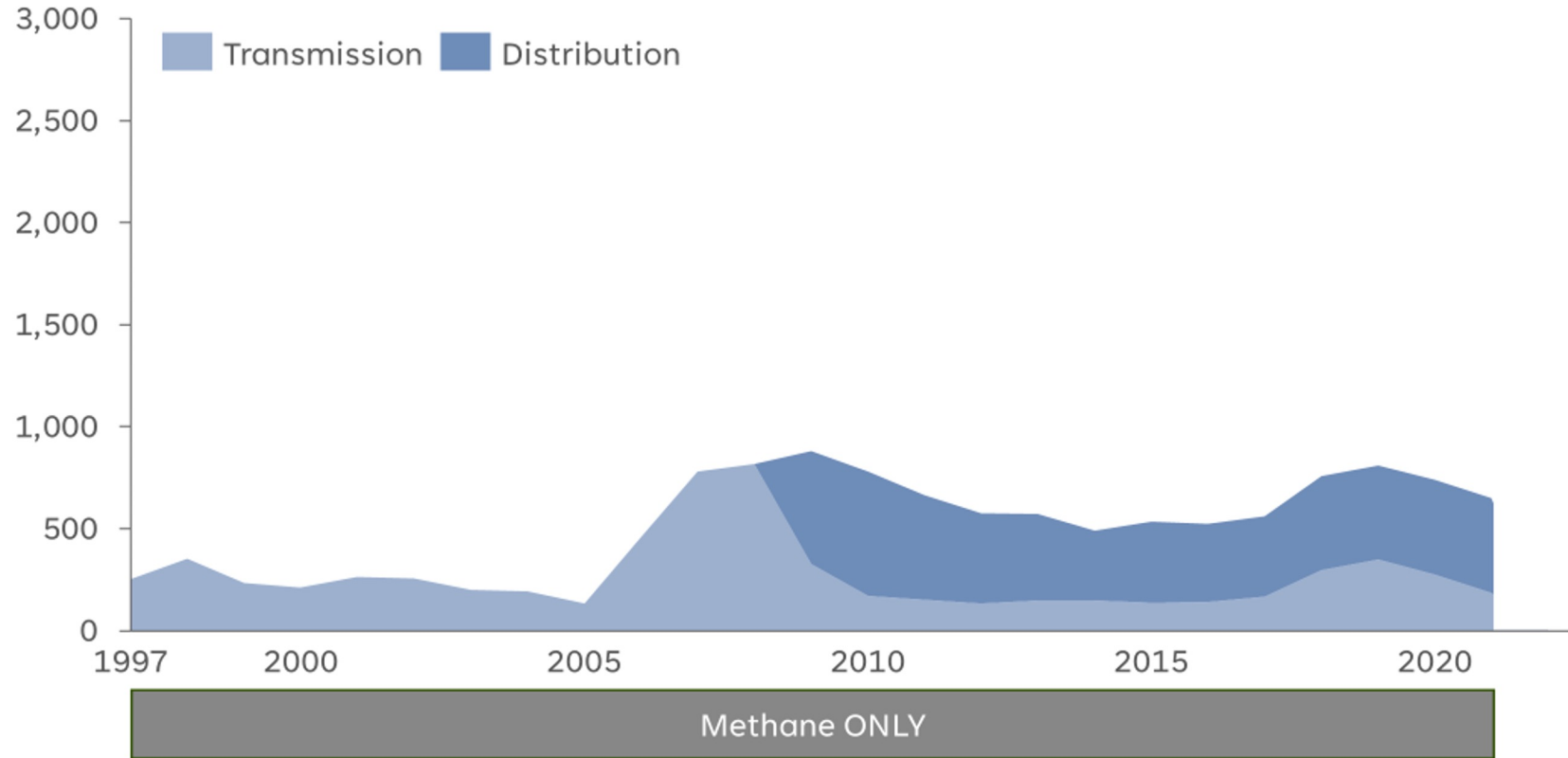
£m CAPEX, 2021-22 prices with CPI adjustment



Sources: (1) Regulating Energy Networks for the Future: RPI-X@20. Performance of the Energy Networks under RPI-X. 13c/09. 27 Feb 2009; (2) Productivity growth in electricity and gas networks since 19901 By Victor Ajayi Karim Anaya Michael Pollitt Energy Policy Research Group University of Cambridge Report prepared for the Office of Gas and Electricity Markets (OFGEM) Revised 21 December 2018; (3) Transmission price control review 2007-2012, Third consultation, March 2006; (4) Monitoring Transco's Capital expenditure A report and consultation document, December 1999, Ofgem. (4) Electricity council, Energy Supply Statistics, 1970-1990. (5) Resolution Foundation – Electric Dreams, 2024, p.10. (6) NIA report, 2023. (7) BEIS network modelling 2020.  
**Note:** Resolution Foundation modelling assumes all cost in BEIS modelling is capex, as is indicated by the Resolution Foundation chart 'Figure 2'. For Adapted estimates from BEIS modelling, methodology removes OPEX, then adds back non load capex based on persistent profile from RII0-2 period.

# The Bowwave of Network Capex in historical perspective - Molecules

£m CAPEX, 2021-22 prices with CPI adjustment



Sources: (1) Regulating Energy Networks for the Future: RPI-X@20. Performance of the Energy Networks under RPI-X. 13c/09. 27 Feb 2009; (2) Productivity growth in electricity and gas networks since 19901 By Victor Ajayi Karim Anaya Michael Pollitt Energy Policy Research Group University of Cambridge Report prepared for the Office of Gas and Electricity Markets (OFGEM) Revised 21 December 2018; (3) Transmission price control review 2007-2012, Third consultation, March 2006; (4) Monitoring Transco's Capital expenditure A report and consultation document, December 1999, Ofgem. (4) Electricity council, Energy Supply Statistics, 1970-1990. (5) Resolution Foundation – Electric Dreams, 2024, p.10. (6) NIA report, 2023. (7) BEIS network modelling 2020.  
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# Headwinds facing infrastructure development

Interest rates

Democratic consent (?)

Headroom in bill

Supply chain capacity



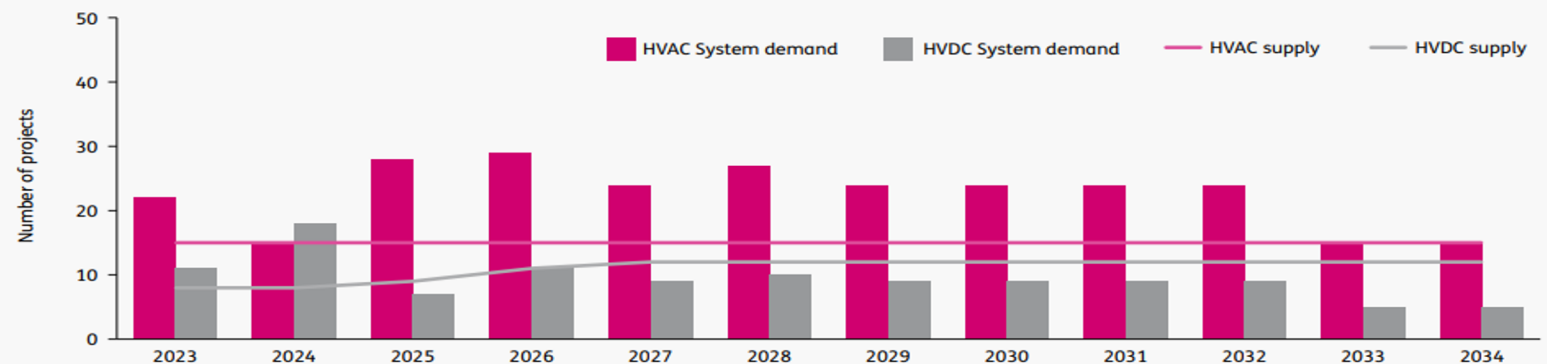
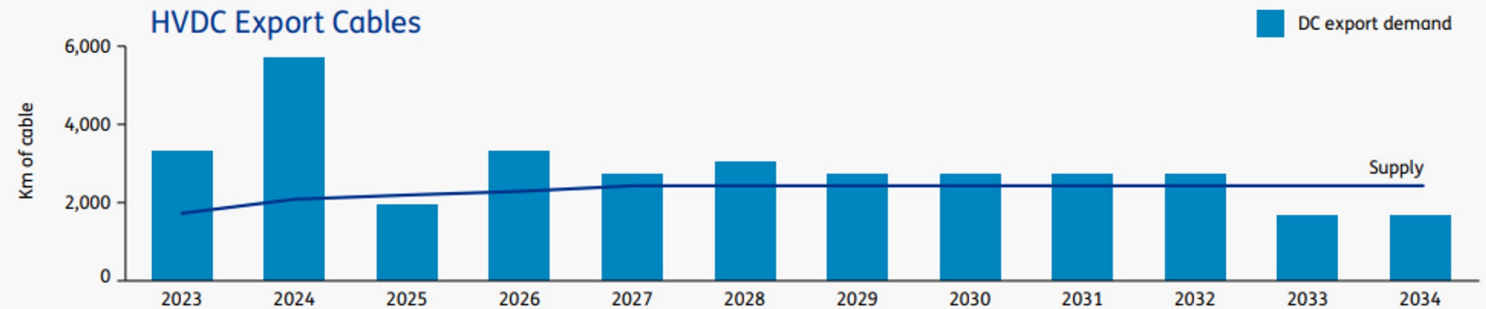
Report prepared on behalf of  
 Baringa  
 Department for Energy Security & Net Zero

## UK renewables deployment supply chain readiness study

Executive summary for industry and policymakers

## Estimated demand for HVDC kit: UK, Europe and Eastern US

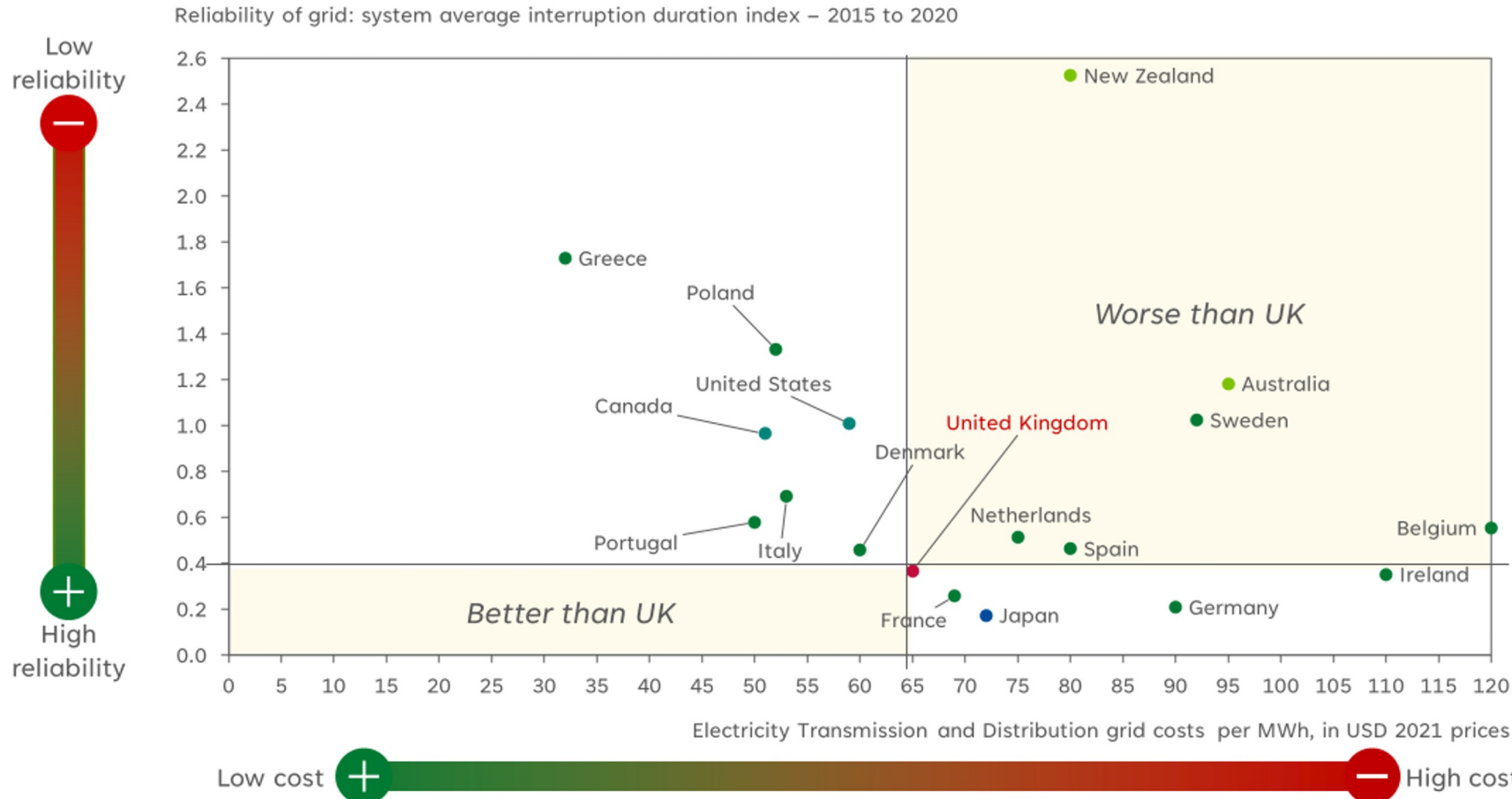
Estimated export and array cable demand and supply: UK, Europe, and Eastern US



Source: DESNZ and Barrigna, UK renewables deployment supply chain readiness study Executive summary for industry and policymakers, April 2024, pp 18-19

# Privatisation seems to have worked well at driving optimisation of cost and reliability

● Australasia ● Europe ● North America ● East Asia ● UK



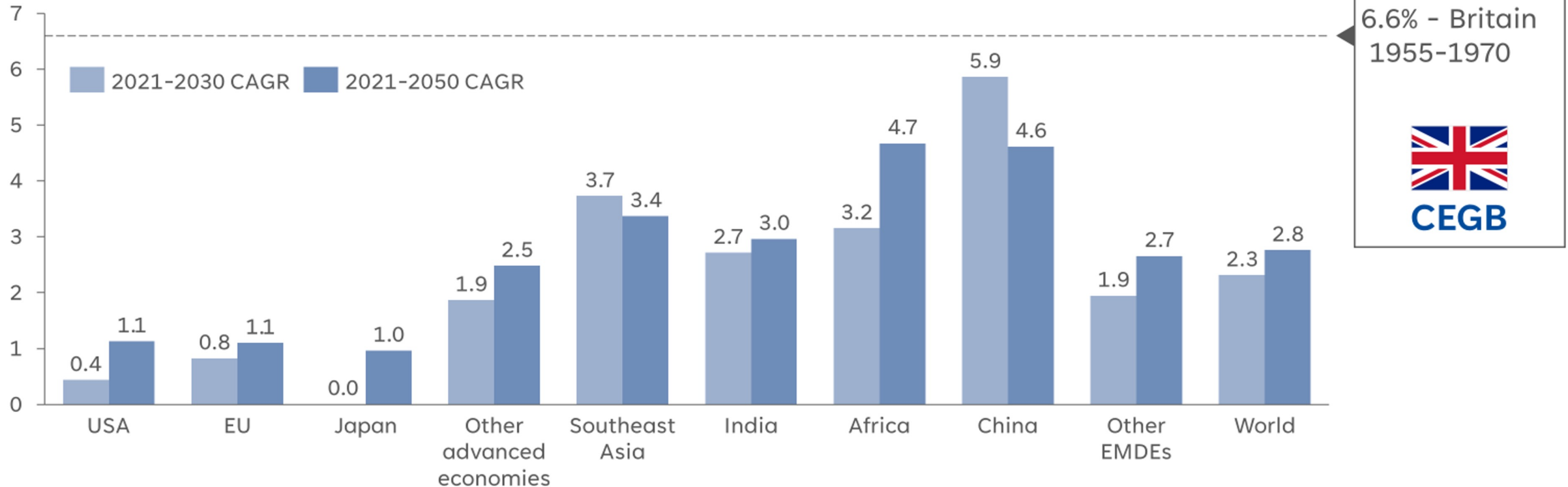
## Observations on UK

- Nowhere in this sample with an obviously better reliability to expenditure ratio.
- A number of countries obviously worse than the UK – that spend more and have worse reliability
- All countries not in yellow areas have made a different trade-off...
- France and Germany have better reliability but spend more.

# Nationalised era was really good at building stuff

Comparison of the forecasted growth in electricity network length, transmission only, around globe from 2021-2050 vs what the British nationalized electricity industry *delivered* in 1955-1970

Compound annual Growth rate for Network length, 2021-2050 based on 'Announced pledges'



Source: IEA, Electricity Grids and Secure Energy Transitions, p. 88. Handbooks of Electricity Statistics, 1970-1990.



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