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Closing the emissions gap
Some trends

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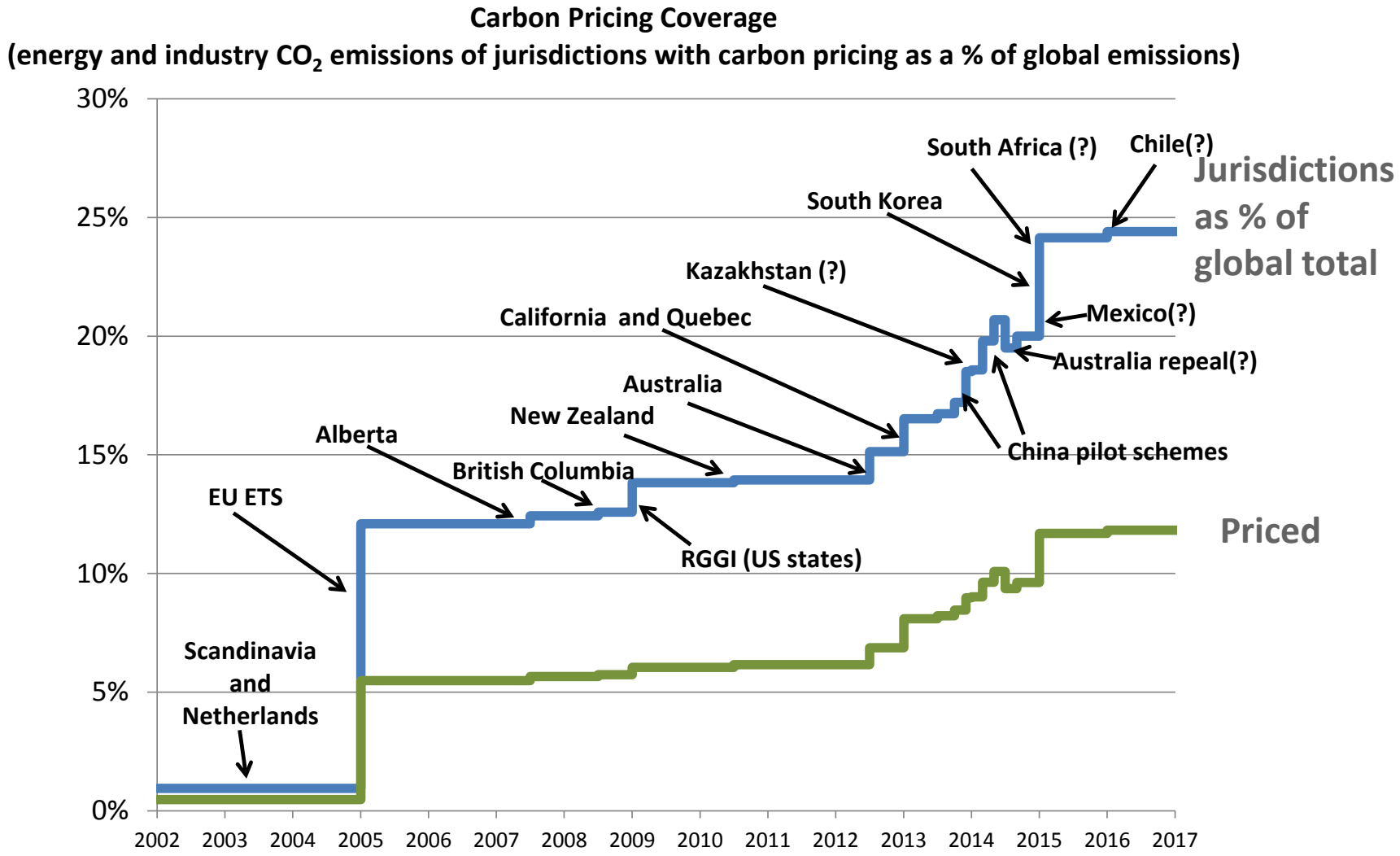
There are signs of progress, but still not enough

- Carbon pricing is spreading ... but with a long way to go and problems where it is in place
- China is increasingly looking to peak emissions in the 2020s … but is building lots of coal plant in the meantime, and gas remains expensive
- Costs of (especially) solar and wind are falling … but intermittency issues remain and CCS and nuclear are making limited progress, while heat and industrial process emissions remain challenging

Carbon pricing is now in place in jurisdictions comprising 24% energy and industry CO_2, with about half of these emissions priced



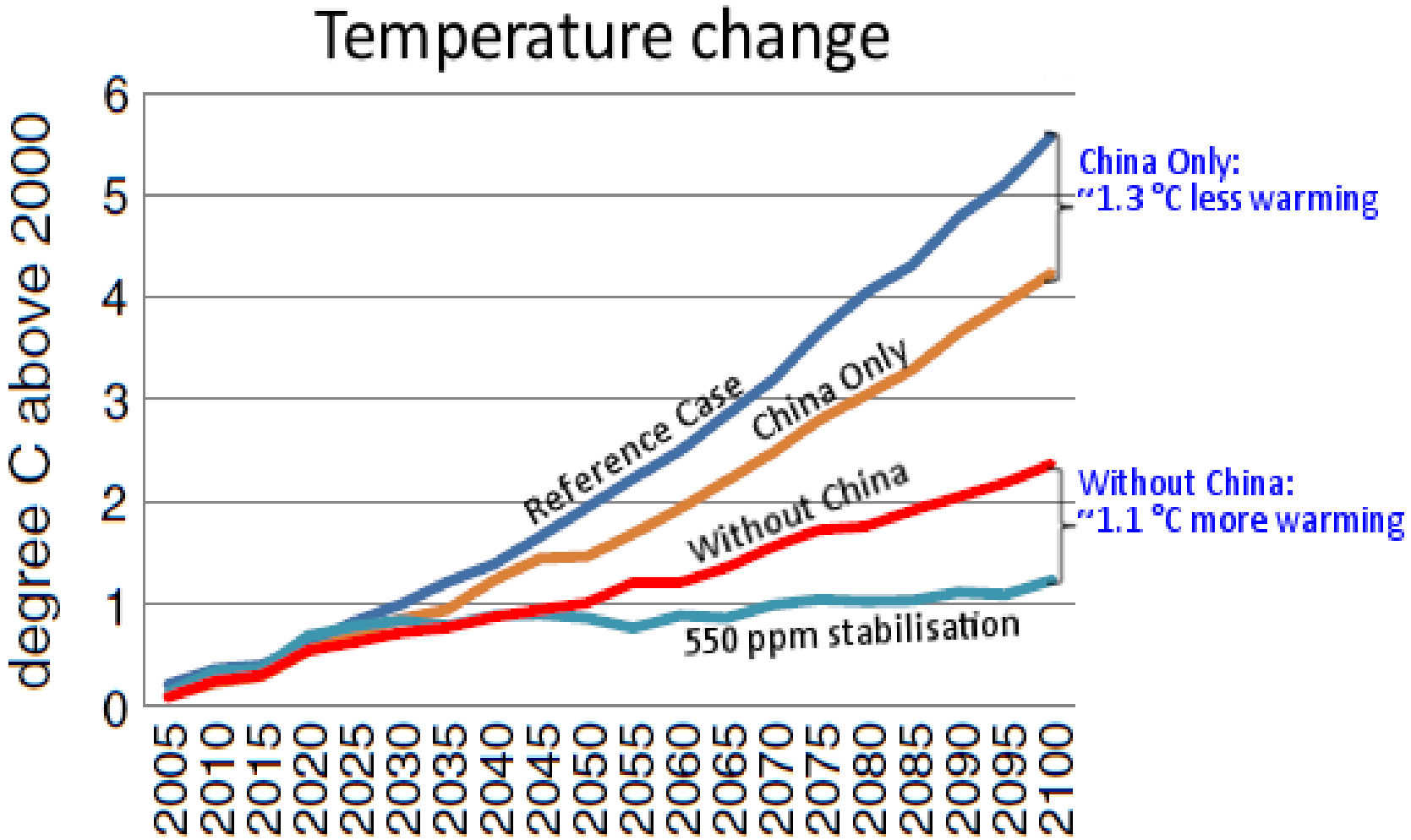
Note: blue line shows percentage of total emissions in jurisdictions with carbon pricing, the green line shows the proportion of emissions actually priced. Typically carbon pricing schemes price about half of total emissions, although coverage varies a good deal.

However carbon pricing continues to face problems

- EUETS oversupplied until the late 2020s at least
  - Cumulative surplus looks likely to rise to over 2 billion allowances later this decade
  - A price containment reserve?
  - From an economic efficiency point of view an auction reserve price would clearly be beneficial
- Australia repeal looking quite likely
- Challenges to national roll-out in China

… The policy challenge is to continue spreading pricing *and* ensure that prices adequately reflect damage costs

China's actions alone can shift temperature outcomes by a full degree centrigrade

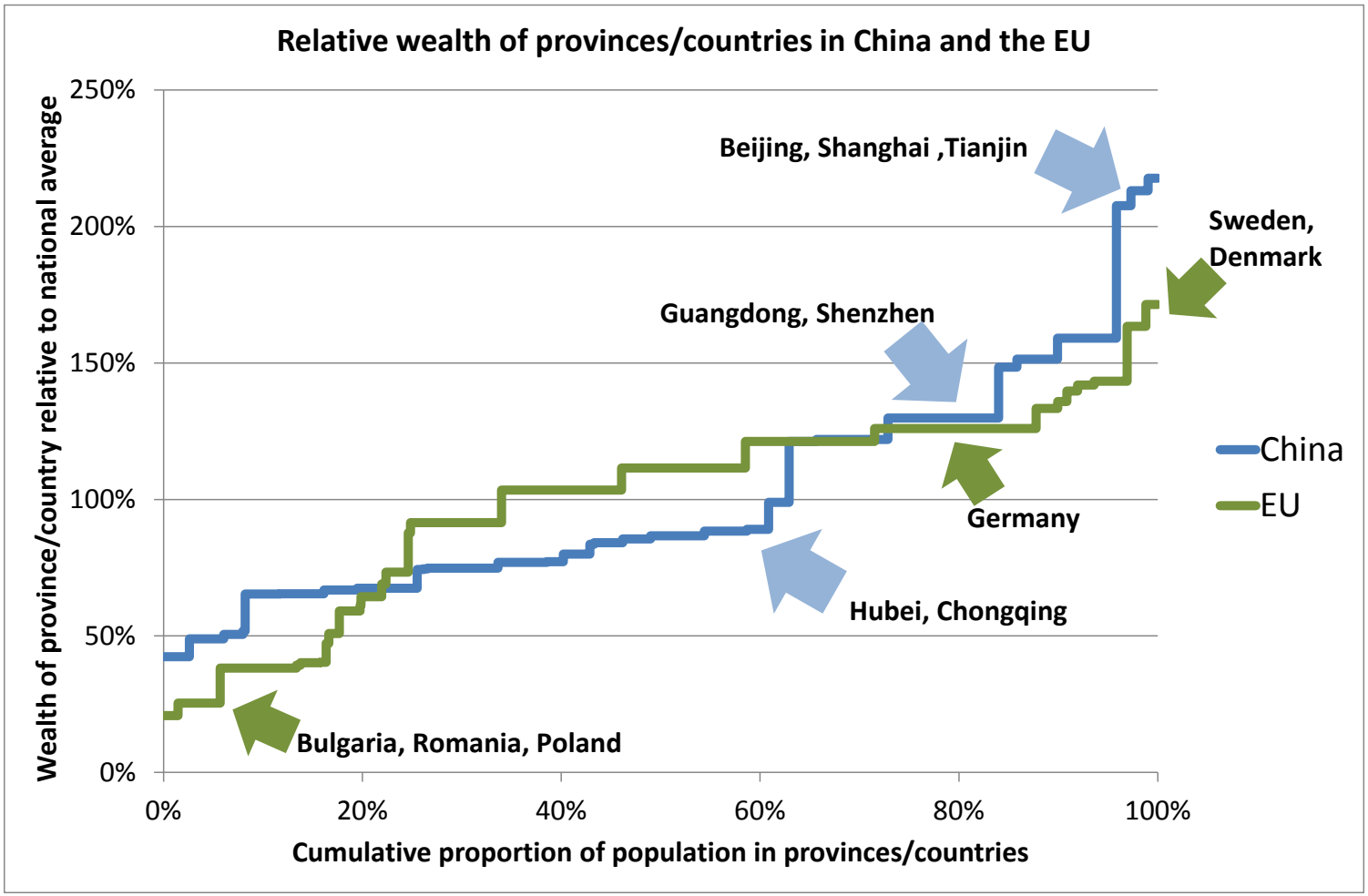


Source: MIT (Paltsev et al., 2012) with own annotations

China has strong incentives reduce emissions reduction as consistent with other policy objectives

Factors directly related to climate change	Wider correlated policy objectives
Concern about effects of climate change on stability, especially due to effects on water and agriculture	Reform looks to move towards a more efficient, service based, less energy intensive growth model
Costs of carbon abatement are lower than in other jurisdictions	Consistency with other policy priorities, especially local air quality
China's own actions can be of sufficient scale to affect climate outcomes	Provincial coordination possible
May help leverage on actions by other jurisdictions	Fiscal objectives may play a role, especially in the longer term

But extending emissions trading in China must accommodate regional differences

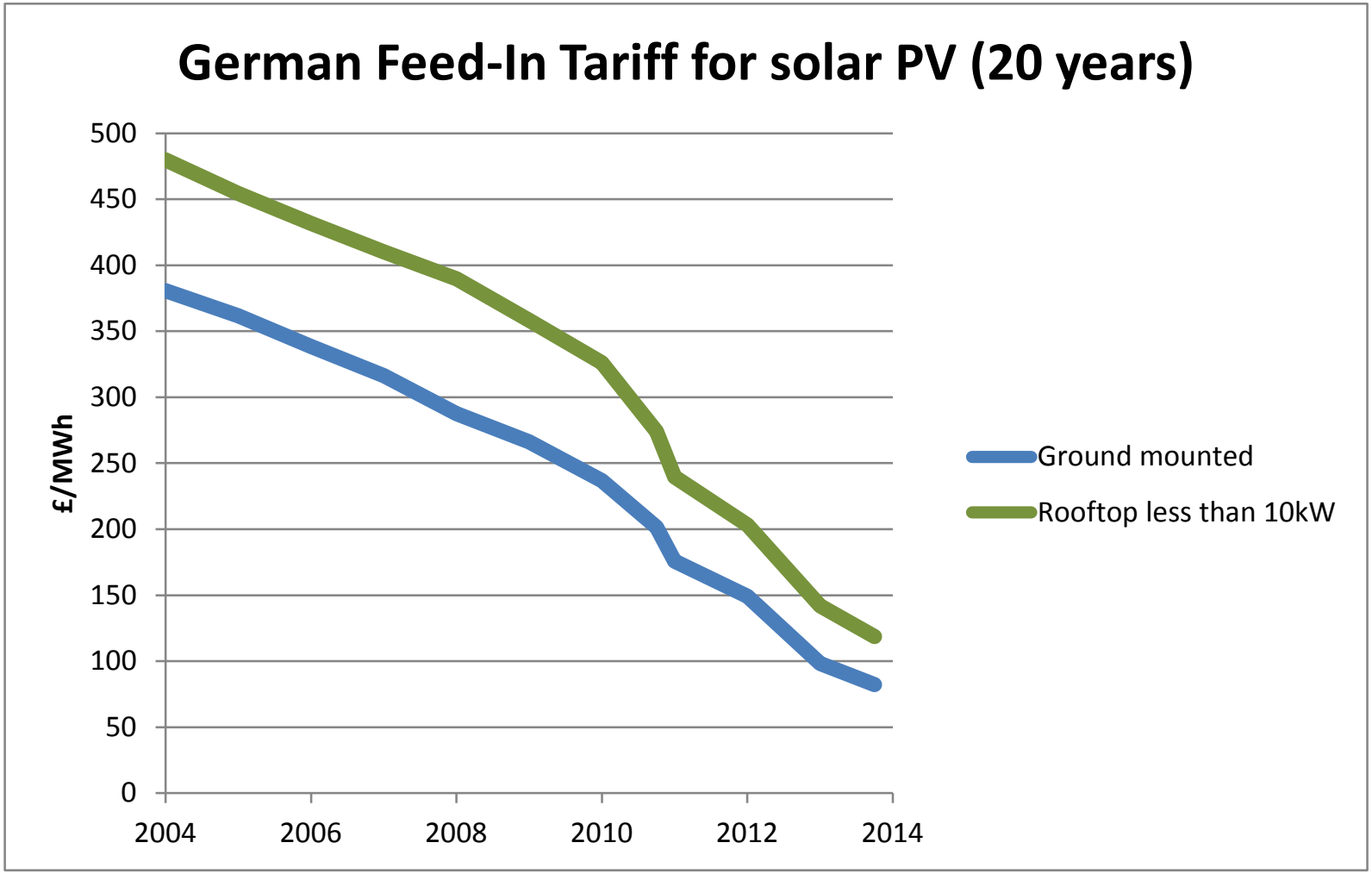


Arrows for China indicate the seven trial emissions trading schemes

… Expect much more action in China, but don't expect smooth, uniform progress

Countries and provinces are arranged in order of average income

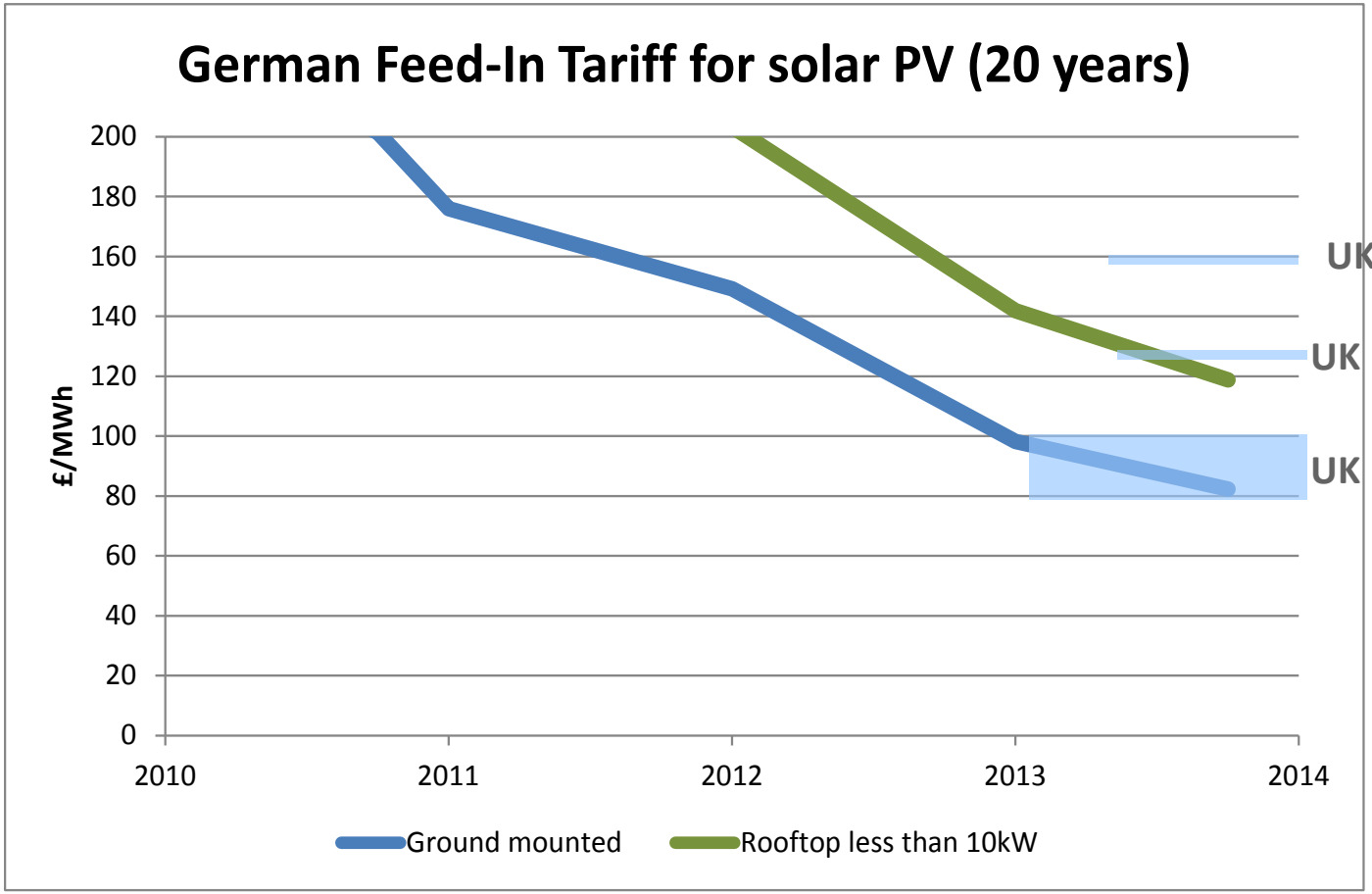
Feed In Tariffs for solar PV in Germany are now a quarter of what they were 10 years



Exchange rate €1.2/£

Costs per kWh are competitive with other low carbon generation (although technology maturity and characteristics vary)

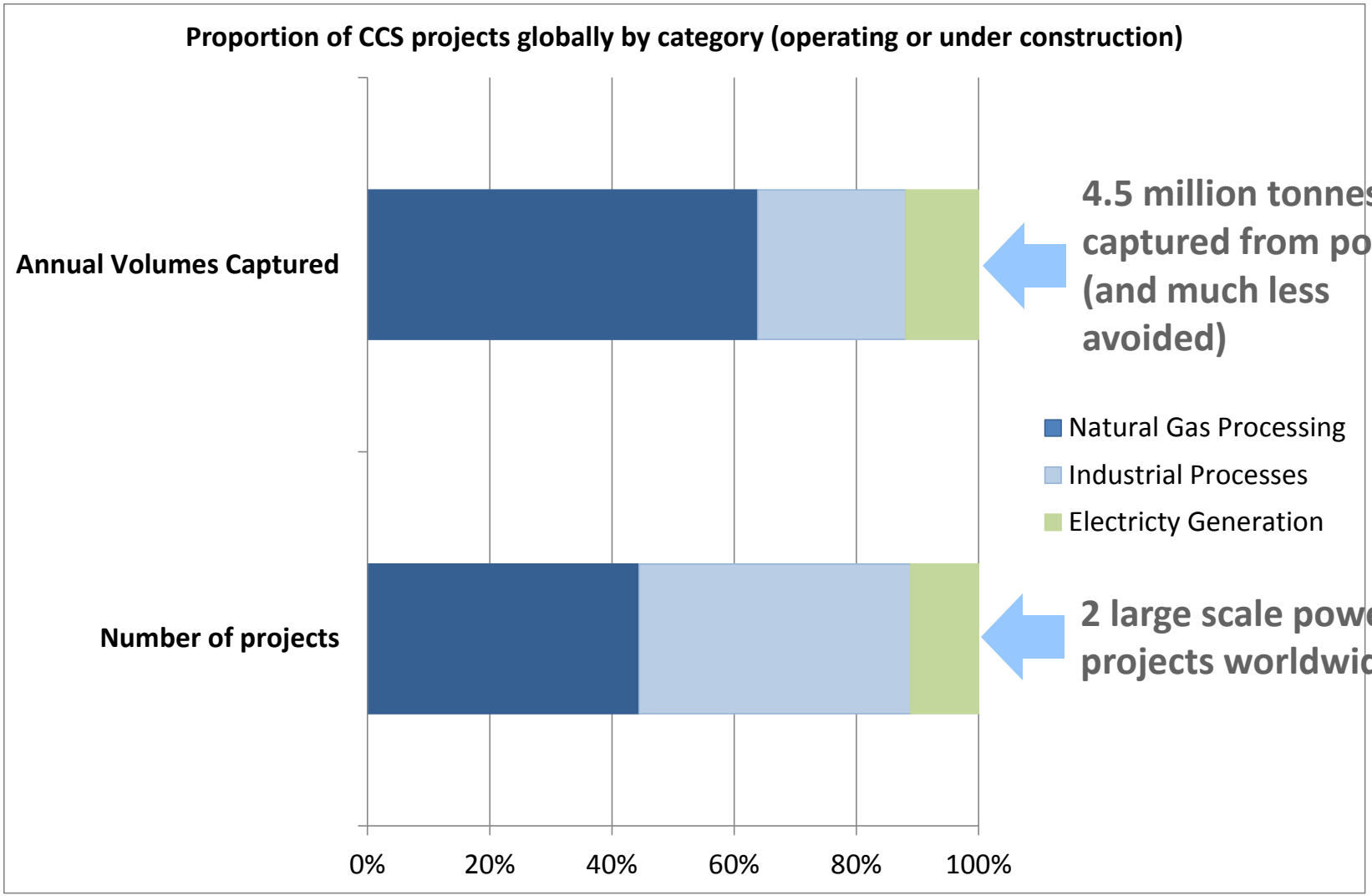
Reported negotiating range for Hinkley C nuclear of £80-100/MWh (??) plus 35 year inflation indexation and loan guarantees vs. German ground mounted solar now £82/MWh for 20 years … and in 2020?



Note: full comparison of nuclear or CCS with solar would need to take into account differences in the value of capacity including back-up, value of power at different times, transmission and distribution costs, and system balancing costs

… Strong policy drivers needed for deployment of all – carbon prices alone not enough. Includes grids and storage for solar.

Progress on CCS in power generation is limited to 2 projects under construction worldwide



Conclusions

- The challenge of emissions reduction remains dauntingly large, with huge equity issues (rich vs. poor, now vs. future generations)
- Many positive signs, but much more is needed
- National and subnational action appears to be more effective than the UNFCCC process, including on carbon pricing
  - need to act at multiple levels (cities, provinces, nations, global networks)
- Action in China is critical
- Falling costs of renewables and the spread of carbon pricing are the most positive trends

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Thank you

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