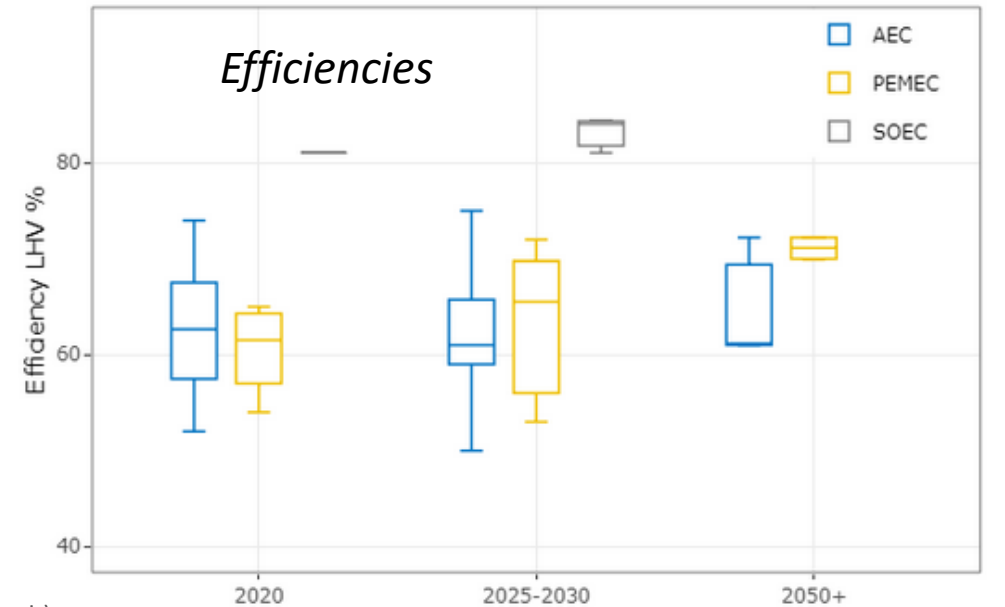
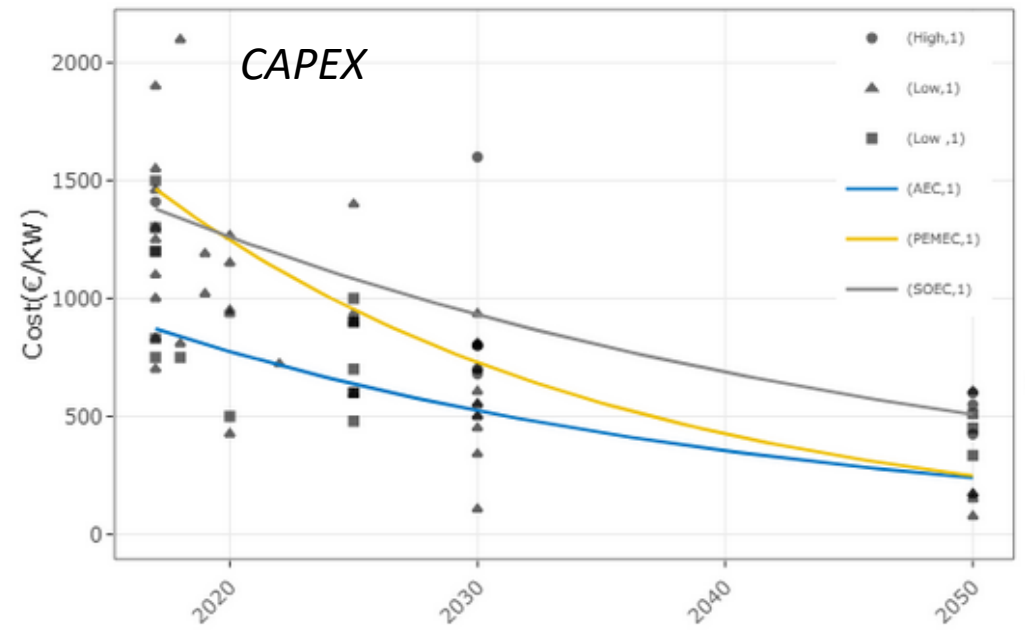
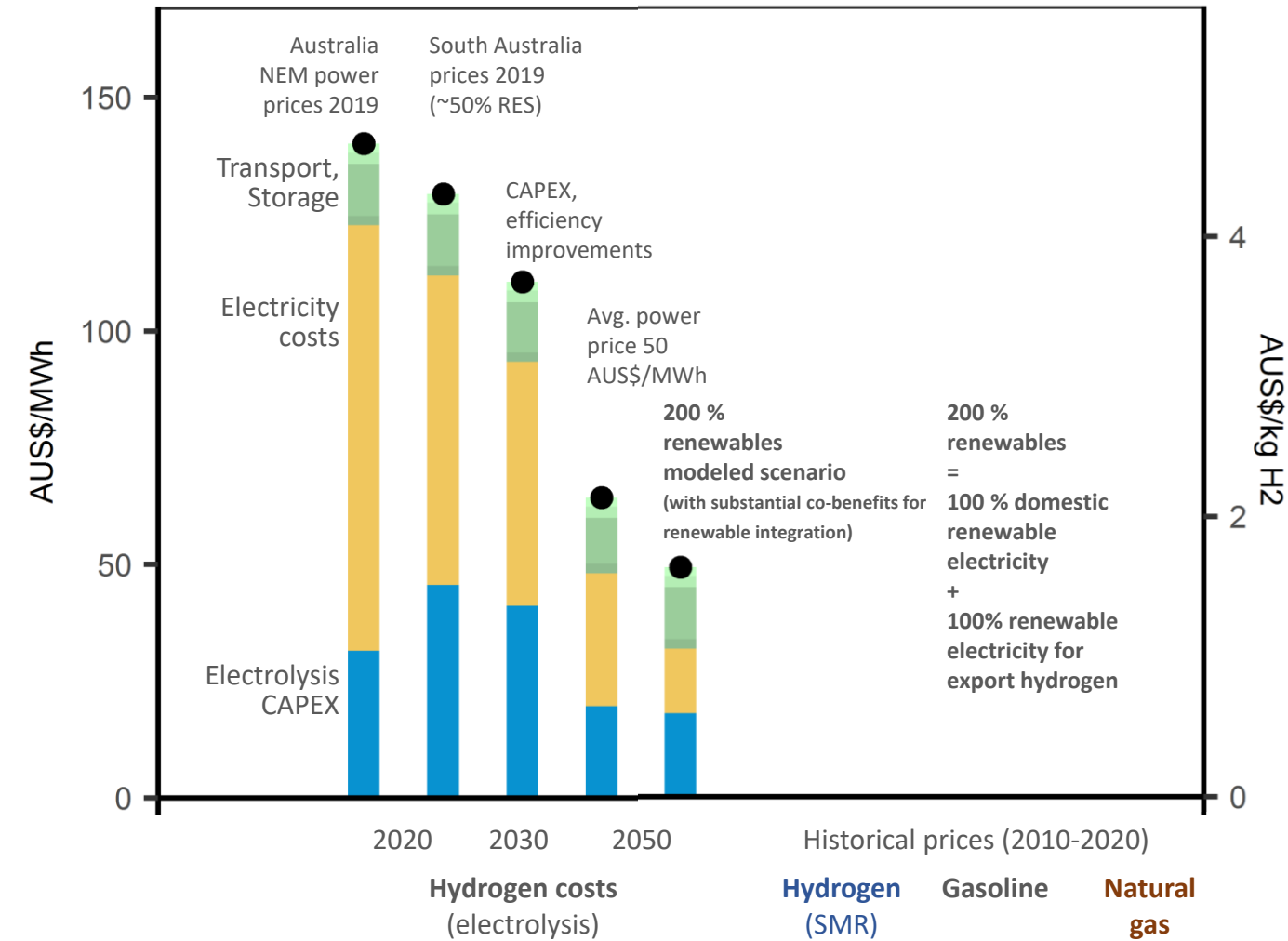


Can green hydrogen become cheaper than electricity?

Feel free to contact me for further information and feedback

Cost reduction paradox: In a >200 % renewable scenario, green hydrogen could be cheaper than electricity (also considering long-term cost reductions)



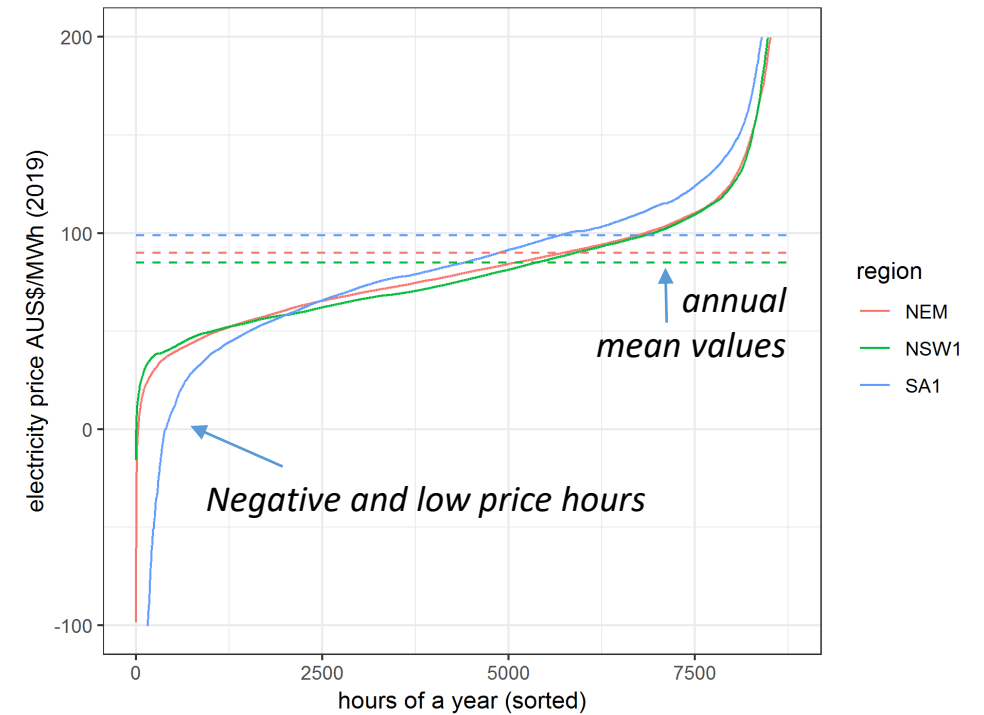
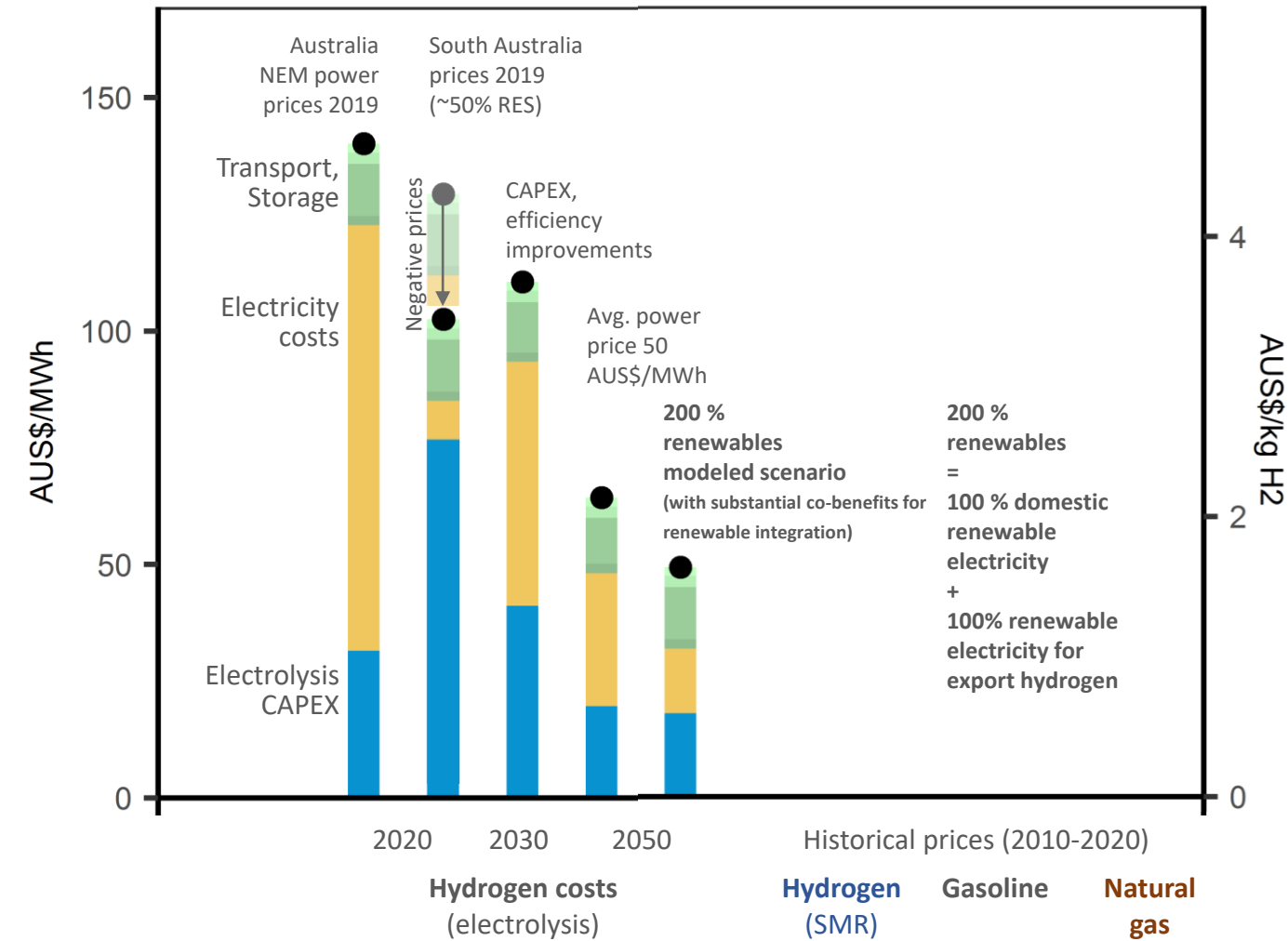
Sources: Literature review, own calculations and scenario modeling. (Bilateral modeling group Energy transition hub, and PIK research)

- 1) Report: Australia's power advantage. Energy transition and hydrogen export scenarios, Australian-German Energy Transition Hub, September 2019
- 2) Research paper: Potential and limitations of hydrogen-based e-fuels in climate change mitigation (close to submission)
- 3) Research paper: Synergies of hydrogen export and a 200% renewable energy transition (in preparation)
- 4) Research paper: Path dependencies of a hydrogen supply curve (in preparation)

Cost reduction paradox: In a >200 % renewable world, green hydrogen could be cheaper than electricity (also considering long-term cost reductions)

Synergies of flexible electrolysers and wind/solar PV power can be seen already today → lower LCOH (and lower power prices)

Electricity price duration curves (2019) indicating the price variability

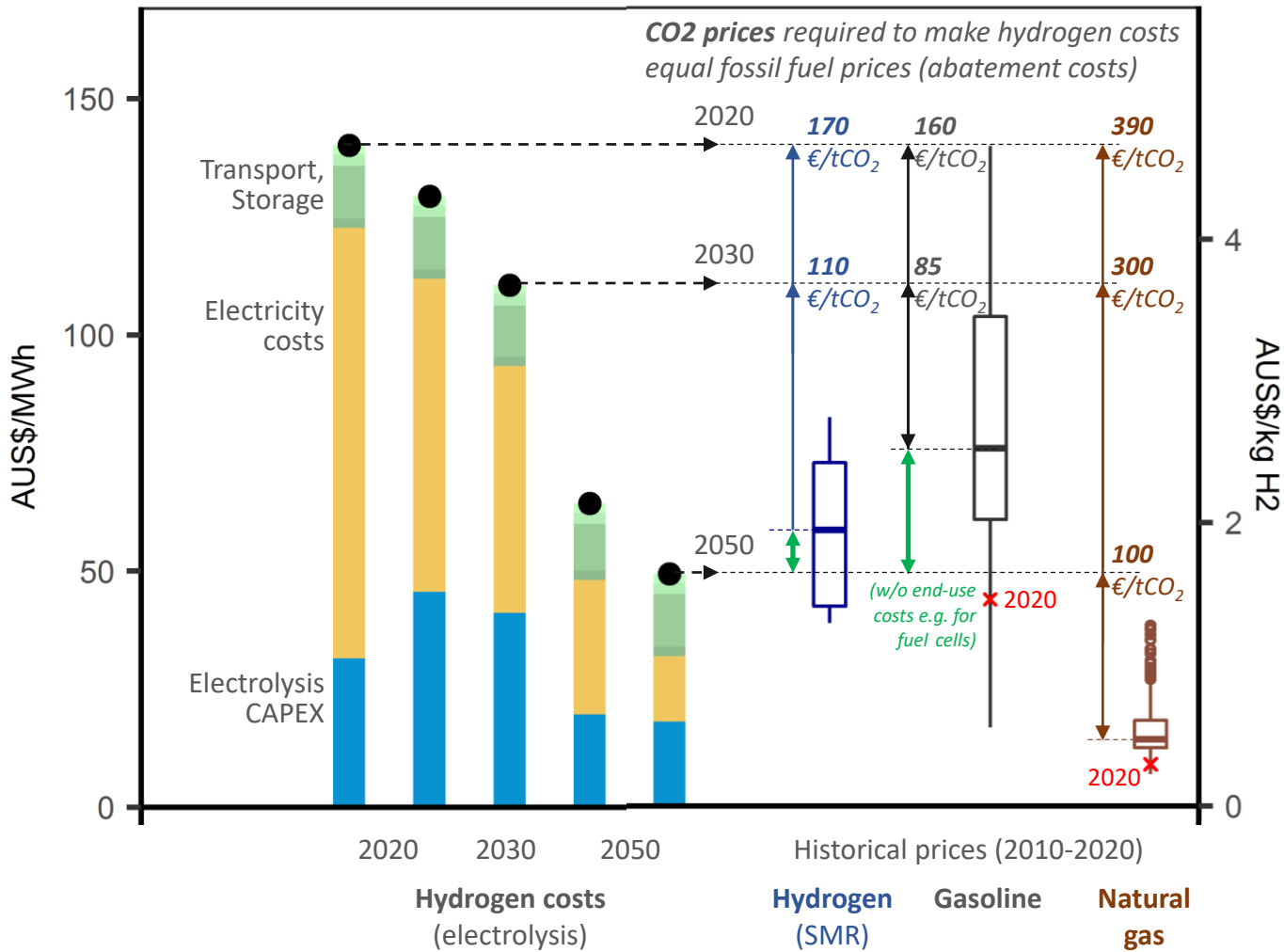


Synergies of VRE and hydrogen
Wind power and solar PV in South Australia increase the number of low price hours

Sources: Literature review, own calculations and scenario modeling. (Bilateral modeling group Energy transition hub, and PIK research)

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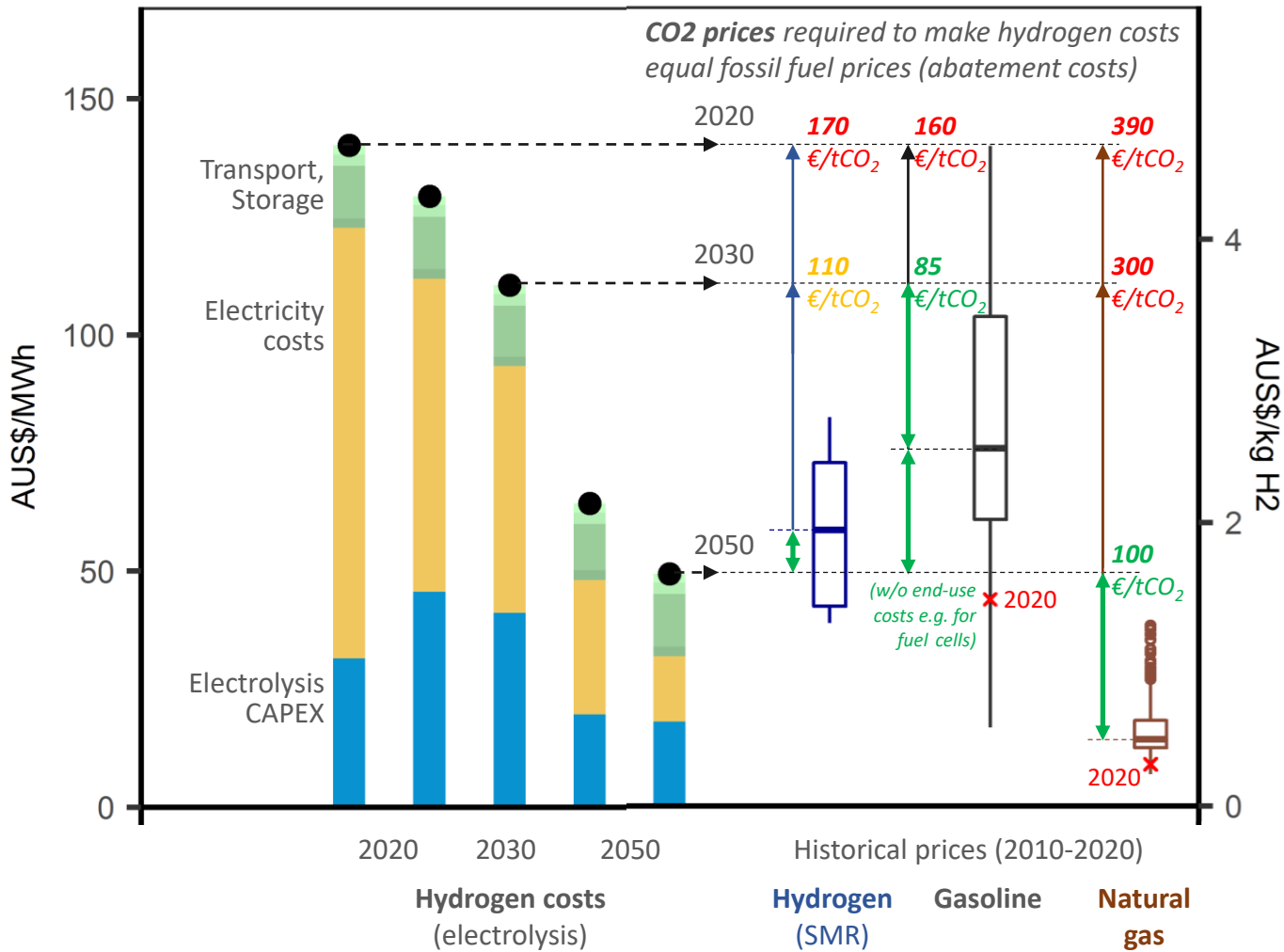
Near-term required carbon prices for hydrogen (and power fuels) are very high, while mid/long-term carbon prices can become low (or even negative)



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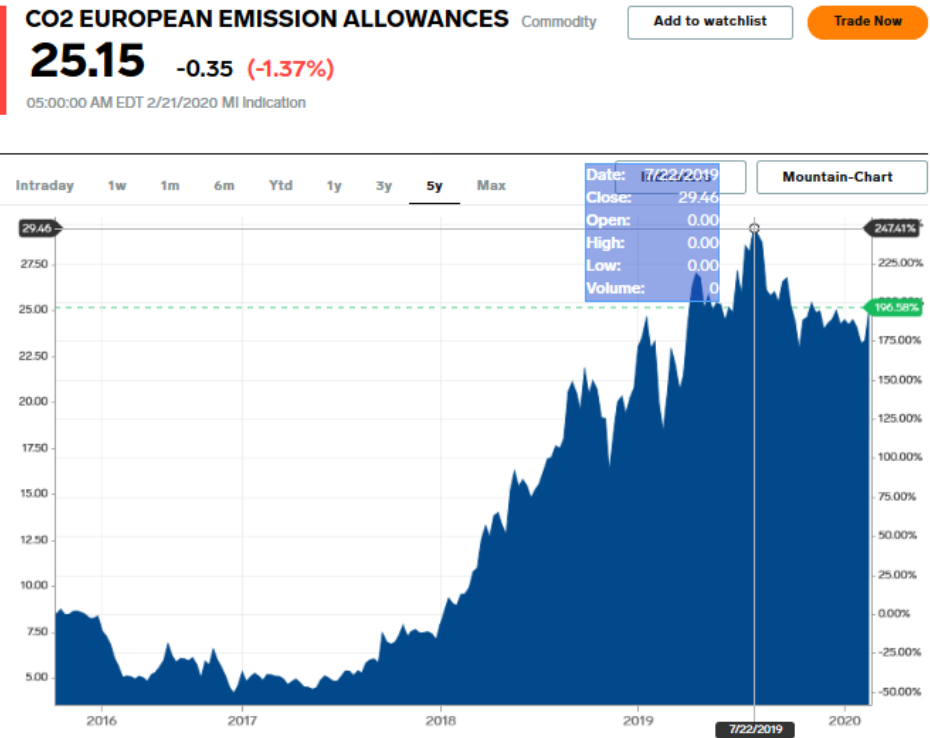


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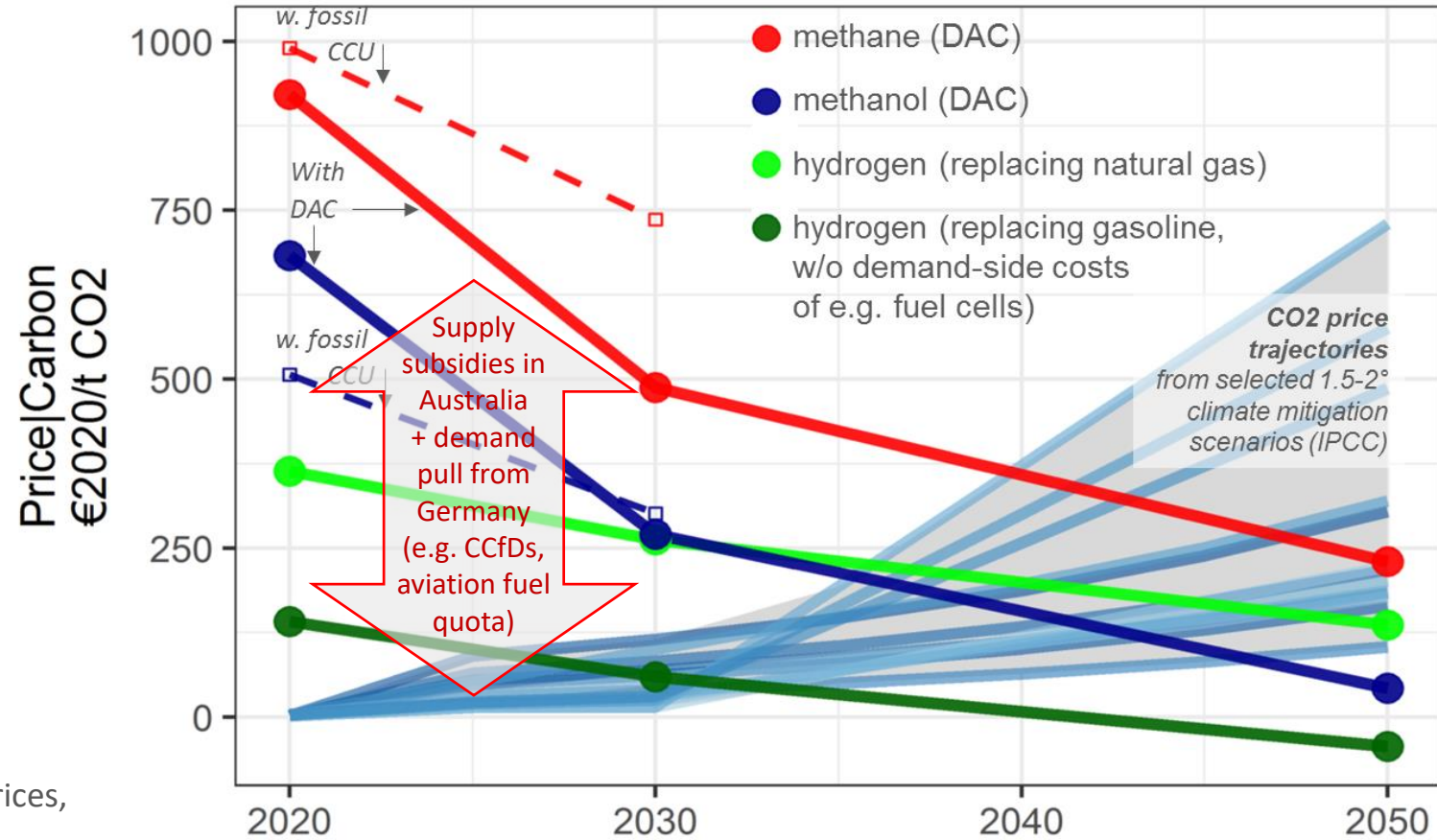
EU and Germany climate&energy policy aims at net zero GHG. That creates a significant demand pull for (green) hydrogen changing the economics in Australia

Hydrogen can become a backstop technology in the long term, broadly replacing fossil fuels (that remain by then)



<https://markets.businessinsider.com/commodities/co2-european-emission-allowances>

Ambitious EU/German targets will significantly increase CO2 prices, especially for non-ETS sectors



CCfDs concepts prioritize scarce hydrogen for sectors that cannot be directly electrified (primary steel, ammonia, olefins)

Sources: Literature review, own calculations and scenario modeling. (Bilateral modeling group Energy transition hub, and PIK research)

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