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The continuing critical role of Gas in the Energy Mix

APPEA conference May 2022

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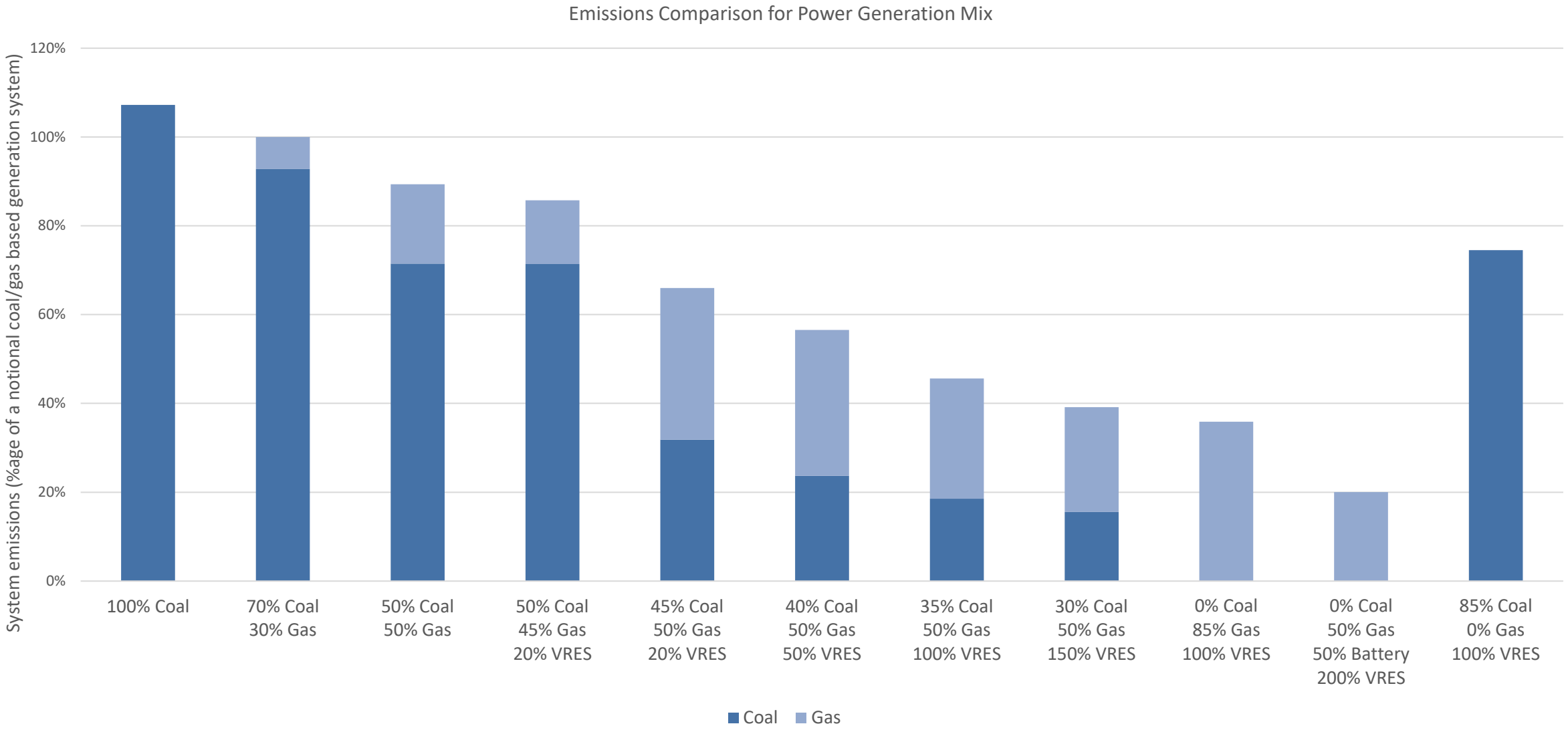
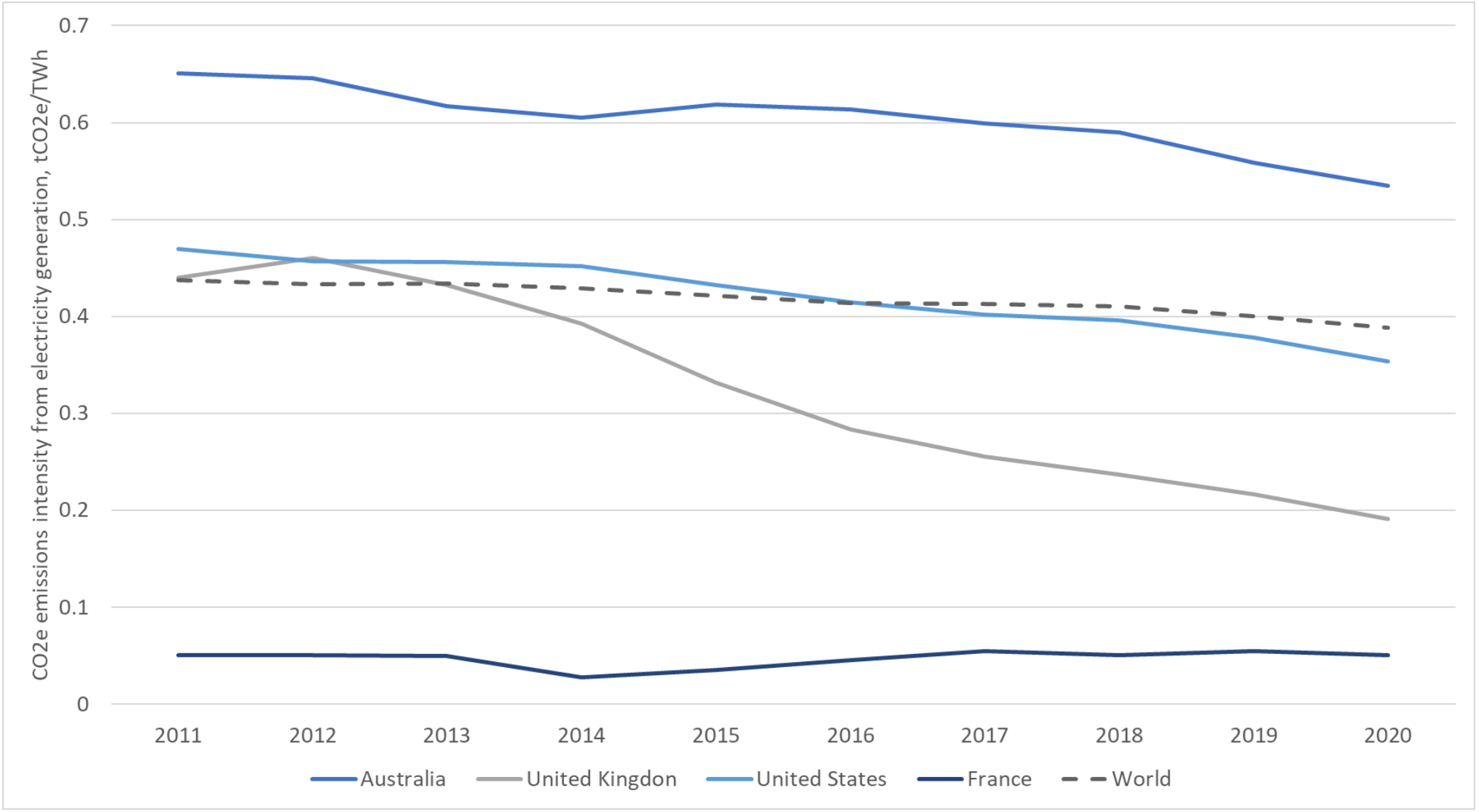
RISC: Getting the Energy Mix Right (2016/17)



Globally emissions reductions have been driven by a switch from coal-fired power generation to gas-fired



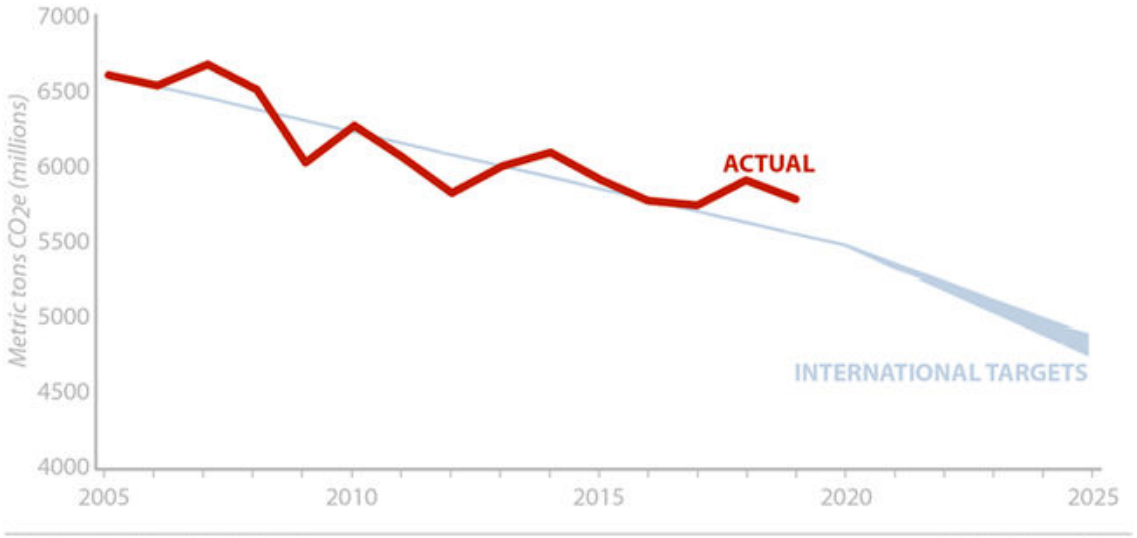
Emissions reductions have been driven by a switch from coal-fired power generation to gas-fired

Increased gas use has helped the USA reduce emissions

- Emissions decline in US has been driven by Market forces – not policy
- Coal plants have been shut in favour of cheap gas (Shale gas (fracc'd) and renewables)
- New policies will likely drive further reductions

U.S. NET GREENHOUSE GAS EMISSIONS RELATIVE TO INTERNATIONAL COMMITMENTS

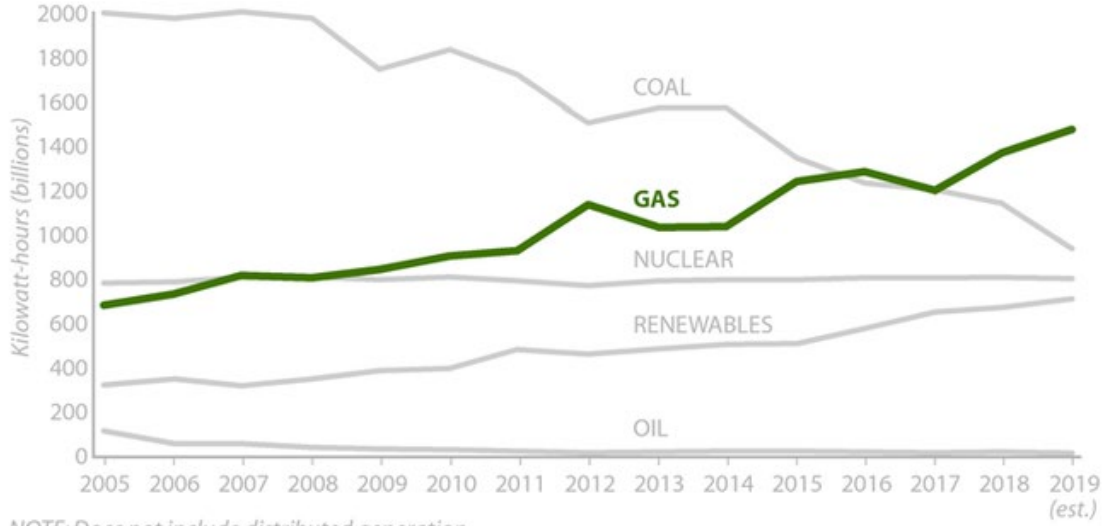
In millions of metric tons CO_2e, excludes international bunker fuel use, 2005-2019



SOURCE: Rhodium Climate Service InsideClimate News

U.S. POWER GENERATION BY ENERGY SOURCE

Electric power sector only, in billions of kilowatt-hours, 2005-2019



NOTE: Does not include distributed generation

SOURCE: Rhodium Climate Service InsideClimate News

Emissions reductions have been driven by a replacement of coal-fired power generation to renewables support by gas-fired generation

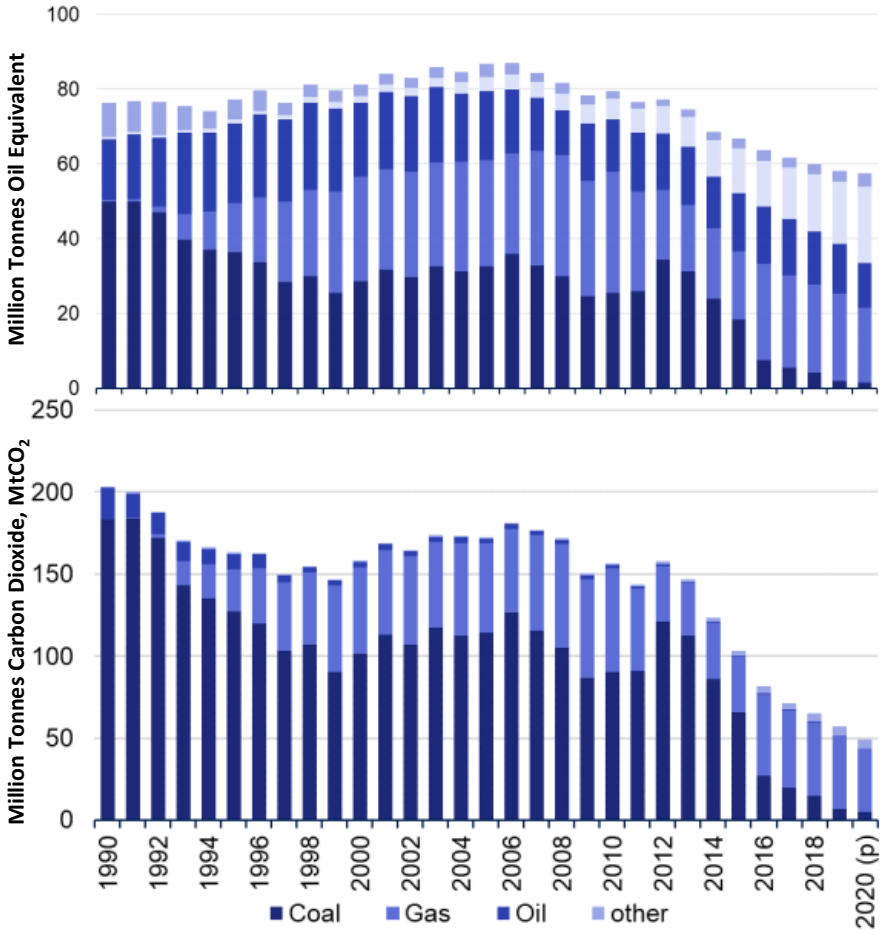
In the UK increases in renewables and decreases in emissions have been supported by gas use

In the UK:

- Emissions from power generation have fallen by approximately 65% since 2010.
- Coal use in power generation has fallen from around 40% in 2010 to less than 2%.
- UK went for 2 months “coal free” in 2020.
- Gas use remained relatively unchanged and its share of the generation market increased to around 35-40%
- UK emissions are now the lowest in over 130 years (since the 1880’s)

2021:

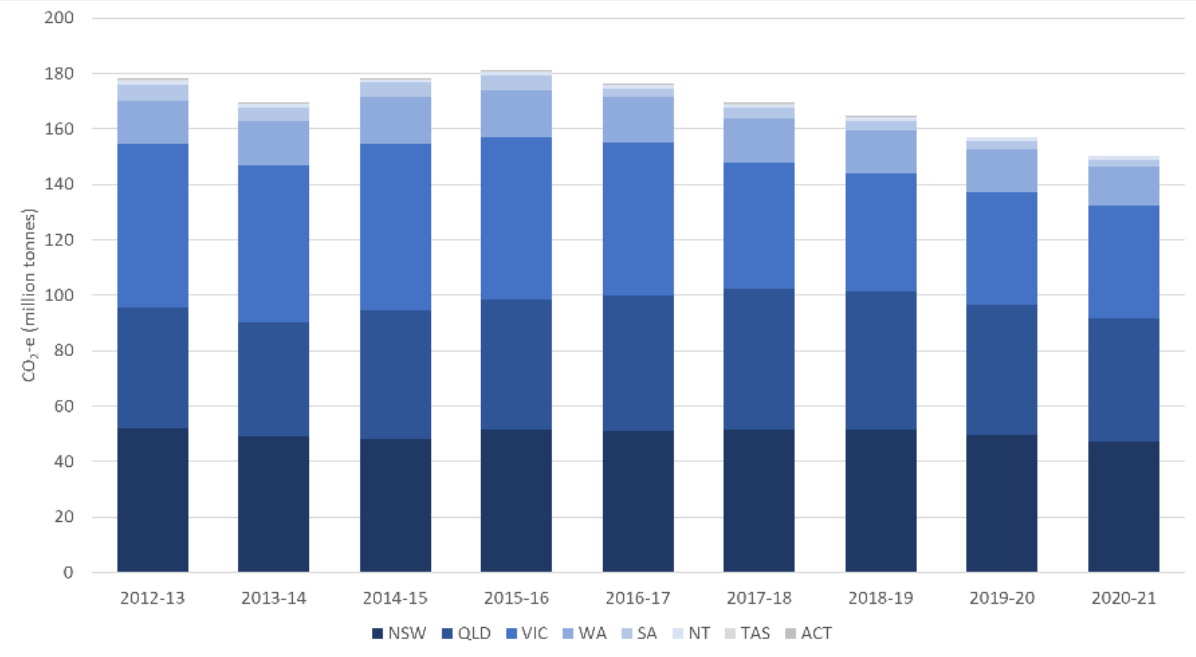
- *3% Growth in renewables capacity of ~1000MW did not lead to a growth in renewables generation*
- *Less sun and wind resulted in a 17% decrease in renewables generation*
- *Gas use increased in 2021 (+19%)*

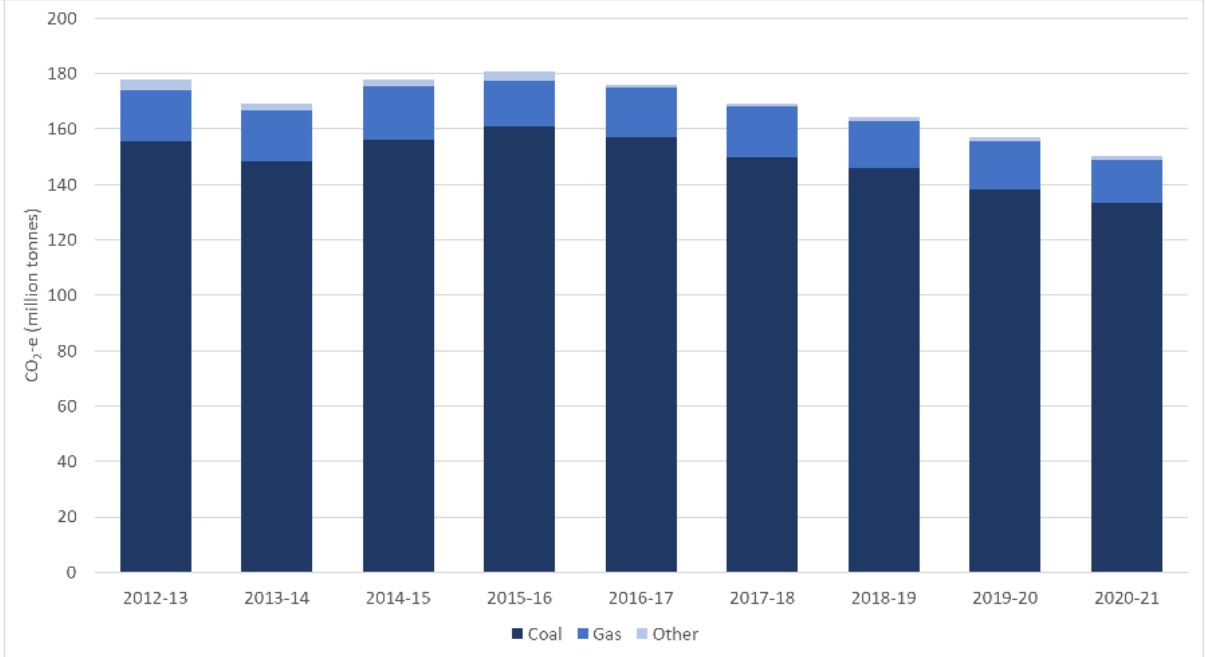


Source: 2020 UK Greenhouse Gas Emissions, Provisional Figures

Australia has not switched from coal…yet

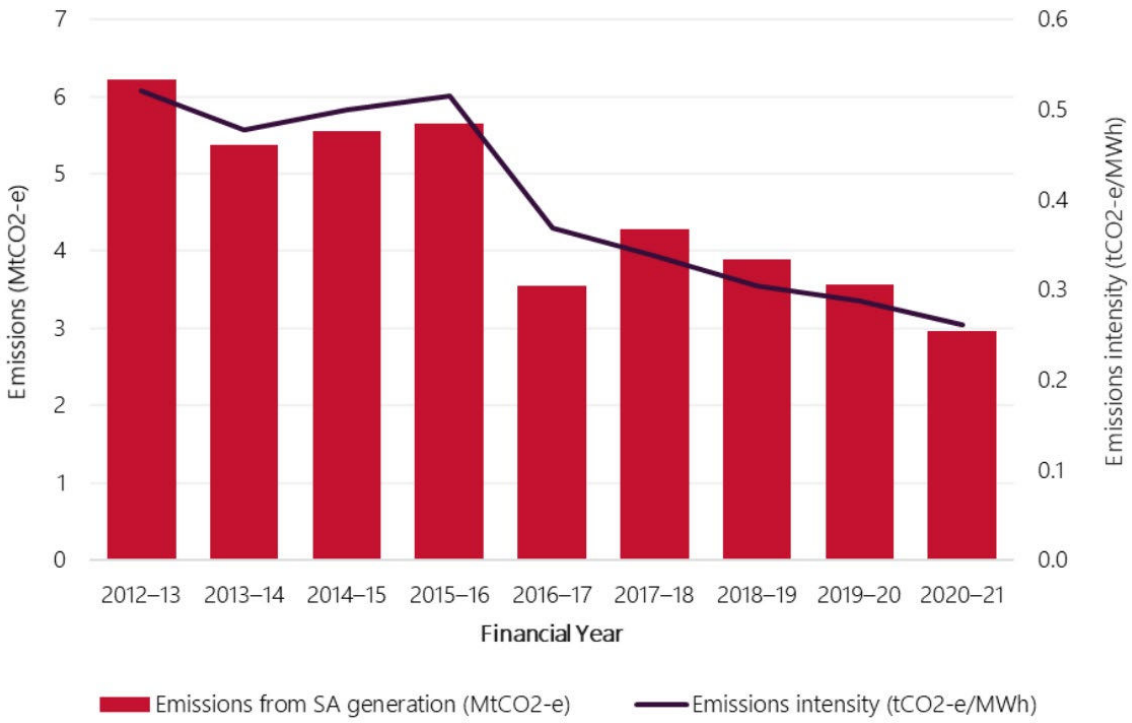
Australian emissions have not reduced as much due to our continuing reliance on coal

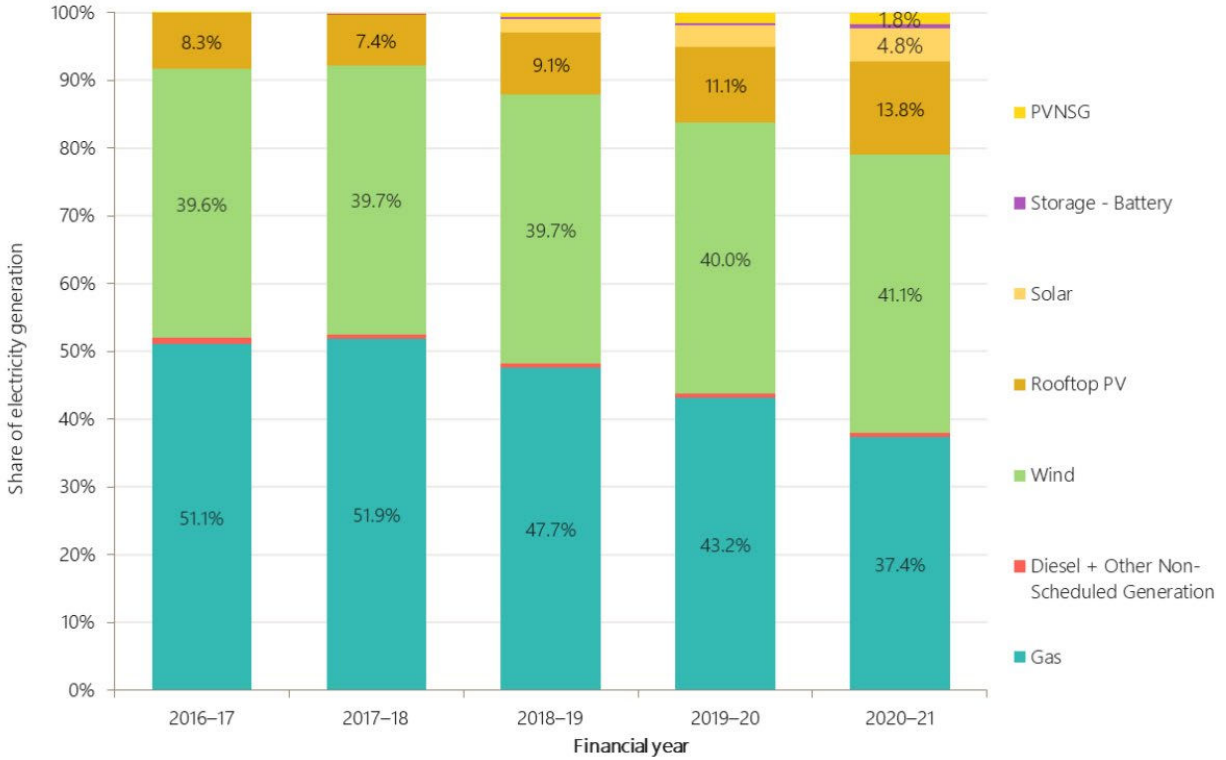




South Australia's renewables success also depends on gas

SA experience shows that batteries do not provide an alternative generation supply





- Hydro and pumped hydro – good in Norway, New Zealand & Tasmania, and Snowy 2 will make a large impact (2GW / 350GWh)
- Nuclear – accepted in many OECD countries but not in Australia
- Batteries
  - SA: 120MW / 190 MWh.
  - NSW: 500 MW / 2GWh (Liddell 2GW)), 700 MW / 1.4 GWh (Eraring 2.9GW)
  - WA: 100 MW / 200 GWh.

Source AEMO SA Electricity Report 2020
PVNSG = 100kW-30MW "non-scheduled generation")

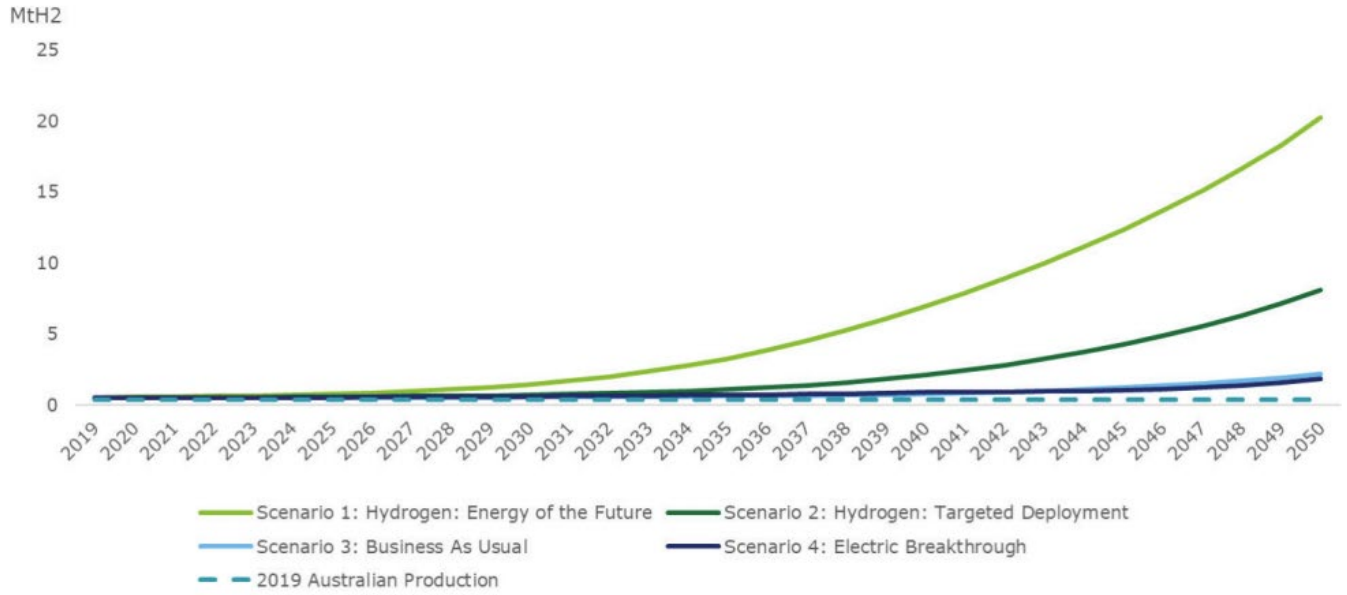
The Hydrogen economy is still a long way away

By 2040 Australia "might be producing" ~5 Mtpa of H_2 (energy equivalent of ~12 Mtpa of LNG)

- Current storage options don't have the long-term capacity required
- Green Hydrogen is a long way-off
- UK Aspirations:
  - 1 GW of low Carbon H2 by 2025 (130 ktpa)
  - 5 GW of low Carbon H2 by 2030 (650 ktpa)
- Current largest electrolysers in the world:
  - 30 MW (China)
  - 20MW (4x5MW in Canada, & China)
- Planned
  - 24 MW (Germany - end 2022),
  - 40 MW (France – end 2024 *pending approval*)

- 650 ktpa is roughly equivalent to 1.5Mtpa of LNG,
- the UK currently imports 10-15 MTPA of LNG, and that is growing.

- 5 Mtpa requires ~40GW of electrolysers

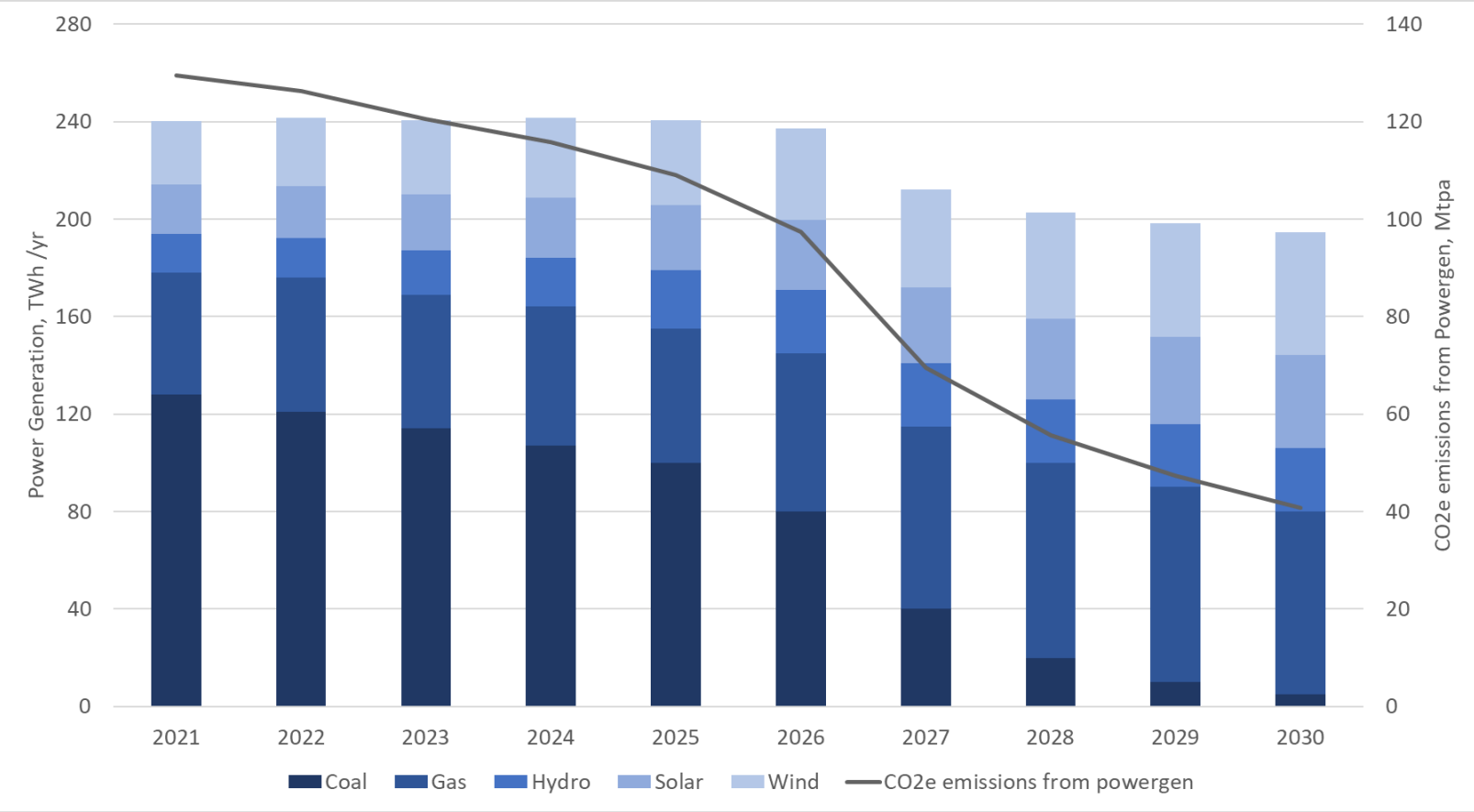


Source: Deloitte Analysis

*Source Australia's National Hydrogen Strategy 2020

What if…

Australia follows a similar path to the UK



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