Factsheet

New coal in Australia: why the business case doesn't stack up

February 2017

New coal power stations are too risky for private investors and too expensive for energy users – so why should the public subsidise them?

A new coal plant would only get built with a government-guaranteed subsidy of around $27-44 billion, because:

+ New coal stations will need electricity prices up to four times higher than today to earn sufficient revenue;
+ They are likely to be obsolete by the time they are built, typically in seven to ten years;
+ The power plants under discussion aren't "clean" – without even more expensive carbon capture and storage, they have higher emissions than the dirtiest gas power plants;
+ New coal is incompatible with Australia's climate commitments, which require no conventional coal in the electricity mix by 2035.

For these reasons, private investors in Australia have no appetite for new coal generation.

Market risk

New coal power stations could be obsolete by the time they are up and running in the late 2020s

+ The most efficient coal power stations are very large and expensive (at least A$3 billion per gigawatt of capacity[1]) and could take up to a decade to build.[2]
+ Meanwhile the costs of renewable and storage technologies are falling, and the growth in wind and solar is reshaping electricity systems. There is less need for large 'baseload' power stations (which provide constant power) and more need for smaller, more nimble power stations that can rapidly switch on and off, and increase and reduce their output to complement variable wind and solar. Coal power stations are poorly suited to be flexible power sources for two reasons: rapid changes in output cause damage to equipment and reduce their operating lives and operating at low levels of capacity makes it harder to earn back their high capital costs. Other technologies like gas-fired generation, batteries and pumped hydro, which are more flexible, are likely to out-compete coal generators.[3] As the CEO of the UK National Grid has said: "The idea of large power stations for baseload is outdated."[4]

The return on investment on a new coal stations would require electricity prices to be up to four times higher than today

+ To make a reasonable return on investment in a new advanced coal station, wholesale electricity prices need to average $80-200 per megawatt hour ($/MWh) over the station's 40-year operating life.[5] This is a lot higher even than the rising prices at the moment (approximately $50/MWh at present, projected to rise to about $75/MWh over the next few years).
+ The upper end of the range reflects several potential costs facing new coal stations: being forced to run as flexible rather than baseload power generation, vulnerability to future carbon policies, and a higher cost of project finance in recognition of these risks.

Carbon risk

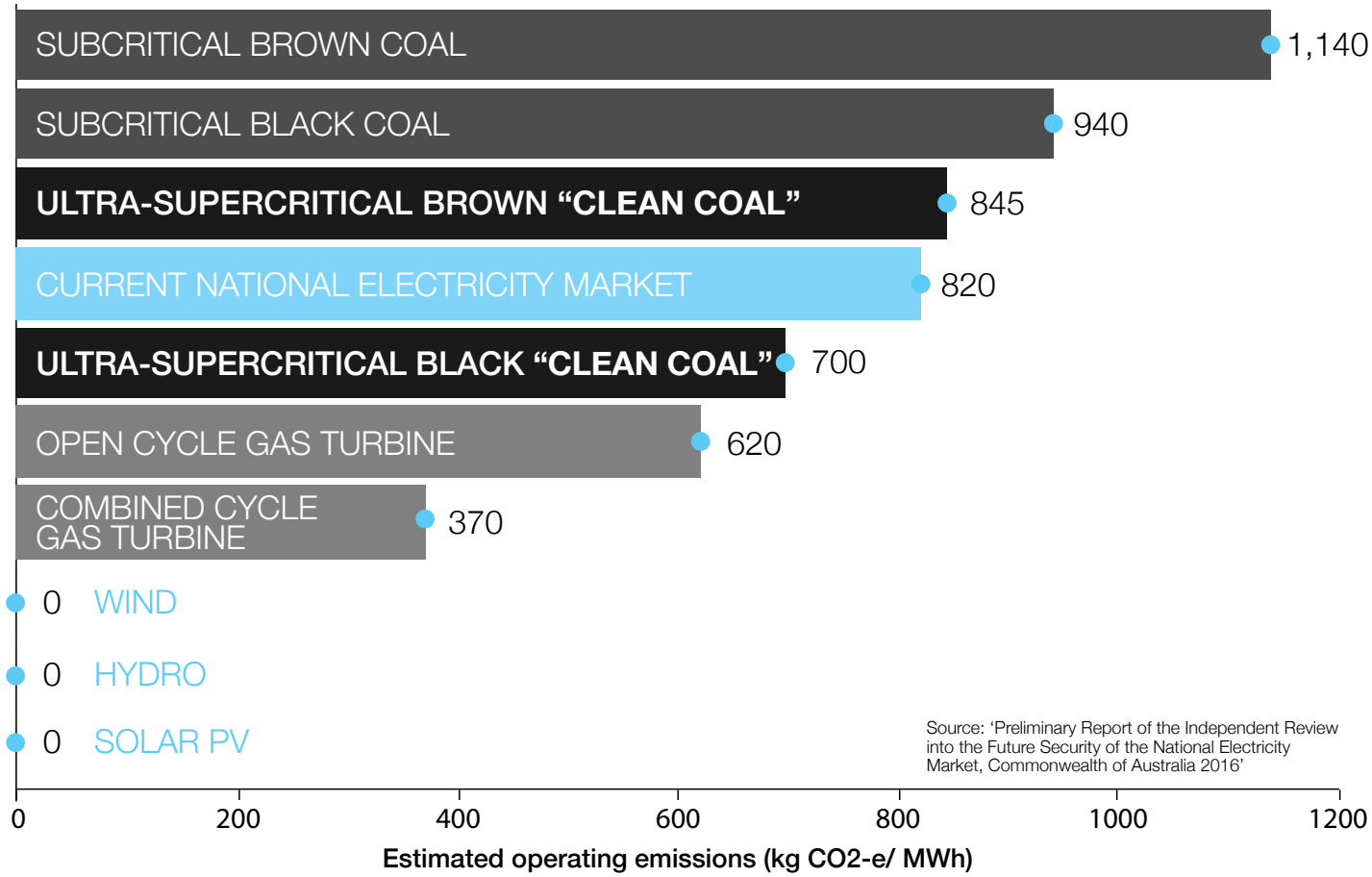
Even "clean" coal has high emissions

+ The most advanced ultra-supercritical coal power stations emit about 700kg of CO_2 per MWh of electricity. This is less than existing coal stations (900-1400kg) but a lot more than gas (400-600kg) and renewables (0kg). A single advanced coal power station would emit over 3 million tonnes of CO2 every year.
+ The only way a new coal station can become a low carbon energy source is with carbon capture and storage (CCS) technology. Bloomberg New Energy Finance estimate that an ultra-supercritical coal plant fitted with CCS would be 50-100 per cent more expensive than the same plant without CCS.[6]

Australia's climate commitments are incompatible with new ultra-supercritical coal stations.

+ Under the Paris Agreement, developed countries like Australia need to transition to net zero emission economies by around 2050, to achieve the global goals of limiting dangerous climate change to less than 2°C and ideally 1.5°C.
+ The electricity sector needs to reach net zero emissions ahead of the rest of the economy so that activities in other sectors like transport and industry can decarbonise through accessing clean electricity.
+ This means our electricity system needs to reduce emissions to near zero over the next few decades. As the IEA points out, to be consistent with the Paris objectives, developed countries need to phase out coal stations (unless they have CCS) by 2035.[7]

Figure 1: Estimated operating emissions for new power stations.



Carbon costs could mean new coal stations become stranded assets shortly after they are built

+ The high carbon nature of new coal power stations makes them vulnerable to any carbon policy. Policies consistent with the Paris Agreement, which commits Australia to take progressively stronger action towards net zero emissions, will likely strand any future coal plant. Even the government's current 2030 target implies a national policy which creates an effective carbon price over $50 will be needed.[8] Even with low carbon incentives and prices, coal power stations are less competitive than cleaner technologies; at $50-100/tonne coal stations will be forced out of the market.

Australian investors have no appetite for new coal

+ Australian energy investors have publicly declared that they will not invest in new coal stations. For example, AGL has committed to not building any new coal generation without CCS, and EnergyAustralia considers coal generation a "legacy technology".

Public costs

New coal would only get built with a multi-billion dollar government-guaranteed subsidy

The government could stimulate investment in new coal stations only by taking on the risks outlined above, which would require a guaranteed multi-billion dollar, multi-decadal subsidy from the public purse or energy consumers. This could be $0.9-1.5 billion per year for a power station the size of Hazelwood, or $27-44 billion over a 30-year lifetime. (This calculation by The Climate Institute has used ultra-supercritical coal cost estimates from the CO2CRC's Australian Power Generation Report, and a forward wholesale price curve based on the average across 16 scenarios modelled by the Climate Change Authority.)

ENDNOTES

1. CO2CRC, 2015, Australian Power Generation Report.
2. The typical construction time for a coal-fired power station is five years, with about another five years preparation. Ecofys, 2015, The Incompatibility of HELE Coal with 2C Scenarios.
3. John Kemp, 2016. "Trump may not be able to save U.S. coal miners:Kemp", 11 November, Reuters.
4. Energy Post, 2015. "Steve Holliday, CEO National Grid: "The idea of large power stations for baseload is outdated".
5. Bloomberg New Energy Finance, 3 February 2017. 'Research - New coal the most expensive form of new supply,' media release.
6. Ibid.
7. IEA, 2016. Energy, Climate Change and Environment: 2016 Insights.
8. Jacobs, 2016. Retail electricity price history and projections. Report for AEMO.