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FLAT WHITE

Nuclear cannot match coal as a competitive electricity supply

Alan Moran

Getty Images

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The debate between the Coalition and the Labor Party has long had an ethereal dimension. They are in furious contention, though both are promoting a wind/solar future. Labor says it wants to see wind, solar, hydro, and batteries supplying all but 2 per cent of the market, while the Coalition – as per Frontier Economics – says it wants to see a similar profile but with nuclear providing 29 per cent of supply.

After Tony Abbott's Prime Ministership, the Coalition adopted a Labor-lite electricity policy. Like Labor, it has paid obeisance to the Western world's prime energy goal of reducing carbon dioxide emissions, though at a reduced pace to that of Labor. It is unclear whether the Coalition actually accepts the ALP view that wind and solar, suitably firmed with controllable power (termed 'dispatchable' in the electricity market) is the cheapest form of electricity.

If it does, it is badly advised.

Frontier Economics recognises that nuclear, in most of Australia, cannot meet the costs that are readily achievable with black or brown coal. It justifies its preference for nuclear by asserting that coal stations would need to incorporate carbon capture and storage to receive a social licence, thereby doubling their costs.

In the era of Donald Trump, the credibility of that position is fast disappearing. Trump will dismantle the coal phobia from January 20 next year, the result of which will see Australia and other OECD countries joining China, India, and other successful 'third world' countries in adopting the cheapest form of power. For most of Australia that is coal (nuclear facilities might be competitive in South and Western Australia), for most of Europe and Japan it is nuclear, while for the US it is gas.

Frontier Economics puts Australia's nuclear costs at $10 billion per 1,000 MW generator with an operation and fuel cost of $30 per MWh. Capital comprises some 74 per cent of nuclear costs and hence a price of $115 per MWh is expected.
The last major official study on costs for Australia, the highly credentialed Switkowski report on uranium, was issued in 2006 and put the costs of coal-generated electricity without carbon capture and storage at $63 per MWh (in 2024 dollars). This cost is consistent with that of

GHD/Solstice, which, in research conducted for the Minerals Council, put the capital cost of coal generators at less than one-third that which Frontier Economics estimates for nuclear power. The Solstice study assessed the costs for coal-generated electricity (in today's dollars) at between $49 and $95 per MWh (where stations run 90 per cent of the time).

At $63 per MWh, a coal-based system, in Australia would deliver electricity at about half the price of the nuclear, wind, solar, and battery system modelled by Frontier Economics. Not only is this important for the economy as a whole but without such cost savings, it would not be possible to ensure the survival of the energy-intensive smelting industries. That means closure of aluminium and nickel smelters that are competing against oil and gas-rich nations and coal-based electricity in Indonesia.

It needs to be understood that renewables can only be built if they are subsidised. The subsidies come in two main forms, one is as renewable energy certificates that provide revenues to wind and solar whenever they run. This puts them in the black as long as the electricity spot price is above *minus* $31 per megawatt hour. Unsubsidised sources cannot operate at such a loss. A more recent subsidy mechanism is in the form of the Orwellian named Capacity Investment Scheme. Under this, the taxpayer has guaranteed a premium price (which the government refuses to reveal) for contracted wind and solar facilities, whenever they run.

A coal-based electricity system not only means a halving of the costs of the electricity supply system favoured by the government but the fundamentally intermittent system is impossible to provide reliability except at horrendous costs involving the totally untried technology of long-term battery storage.

Nor could a renewables-dominated system coexist with the high capital cost electricity supply sources that are coal and nuclear. Those generators

can only be economic if they operate at around 90 per cent. Spreading the capital cost over lower outputs wrecks their economics. Coal and nuclear, unlike hydro (which has limited fuel supply) and gas (which has lower capital costs), do not complement wind and solar. Or, at least they do not do so if they are obliged to back-off when there is ample wind and solar.

I believe it is wrong to claim, as others have, that 'nuclear can provide the steady baseload power needed to complement intermittent sources like wind and solar'. Frontier Economics recognises this and its modelling implicitly forces renewable energy supplies to back-off when nuclear is available. This, together with the constricted increased transmission building that Frontier Economics proposes, is recognised by the chorus of opposition to Frontier Economics's proposal from the renewable industry's subsidy-seekers.

Finally, forecasts 30 years ahead in the electricity market have been markedly inaccurate. The aforementioned Switkowski report pictured the 2029/30 electricity supply to be 69 per cent coal and 22 per cent gas; wind and solar were seen as contributing 2 per cent. For 2024, wind and solar have 28 per cent, coal 46 per cent and gas 19 per cent.