

COAL CLOSURES DARK AGE

Recklessly closing more coal-fired power stations threatens to condemn Australians to a new dark age, argues IPA Research Fellow **Kevin You**.

Lights out, Sydney.

Photo: OzRocky/Flickr

In April 2023 the Hunter Valley in New South Wales will lose an icon, which—for the last two generations—has been providing reliable, baseload power to factories, businesses, schools, and families in NSW and the rest of the Eastern seaboard states. Liddell, the next coal-fired power station to be decommissioned under the policy of achieving net zero emissions by 2050, first came online in 1971 with a 500-megawatt generation unit. Three more units of the same size came online in the subsequent two years. With a combined capacity of 2,000MW, produced by its four units, by 1973, Liddell was the most powerful electricity generator in the whole of Australia.

The reliable and affordable power it provided was critical to supporting Australia's manufacturing sector through its most challenging times, starting in the early 1970s. Along with the Bayswater Power Station, which came online about 15 years later, Liddell and the coal mines that fuel both facilities have been providing stable, secure, and high-income jobs for locals in the region; supported communities in Singleton and Muswellbrook among others; and contributed to Australia's economic prosperity.

In 2015, Liddell's owner, AGL Energy, announced its decommissioning plan. Several years later, after over 45 years of service, Liddell's operating capacity was downgraded. In April 2022, AGL pulled the plug on one of Liddell's four generation units. At the time of writing this article, the remaining three units were due to be taken offline on 28 April 2023. Also at the time of writing, Liddell still produced around 6,000 gigawatt-hours of electricity per year, which is enough to power around 750,000 homes. This amounts to just under 10 per cent of the electricity consumption of the entire State of NSW.

Despite expectations that new generational capacity would come online to plug the gap left by Liddell's decommissioning, such as the \$152 million upgrade to Bayswater (also owned by AGL) and a series of battery-firmed renewable facilities, the Australian Energy Market

Operator has expressed serious concerns about the abilities of these replacement facilities to do the job. In its assessment, AEMO said Liddell's decommissioning will risk blackouts (the risk assessed as up to five hours of blackouts for 200,000 NSW homes every three years over the summer months).

LIDDELL'S CLOSURE IS PUTTING MORE PRESSURE ON THE ENERGY GRID

The power that Liddell supplies to the grid must be replaced by something else upon its decommissioning—and while, on paper, NSW's four remaining coal-fired power stations have the necessary capacity, increasing their output will increase the risk of unplanned outages. Electrical engineer Ben Beattie estimates that to meet the State's summer electricity demand without Liddell, NSW's remaining coal-fired power generators would have to operate at an average capacity factor of 93 per cent whereas the five-yearly average capacity factor for the State's coal-fired power plants is approximately 60 per cent. It is not a realistic possibility.

Closing coal-fired power stations does not magically lower electricity consumption.

In his analysis, Ben noted:

Requiring aging power stations to operate at very high capacity factors during peak demand exposes the grid to higher risks of unplanned outages—i.e., load

shedding or blackouts. Forcing early closures of coal-fired power stations increases the probability that units will be deliberately run to failure in order to avoid spending on planned maintenance, thus reducing reliability. Replacing Liddell's output requires approximately 400,000 tonnes of additional coal for each of the four remaining coal-fired power stations.

Removing coal-fired power stations from the electricity grid does not magically lower consumption. Liddell's decommissioning will only increase the output of other local coal-fired power generators and increase the demand for more expensive dispatchable sources of power—such as gas and hydro—thus pushing up wholesale prices. Neighbouring States—Queensland and Victoria—will see increased output from their local power stations due to increased demand through the interconnectors to NSW. Increased wholesale prices will follow in these States. With South Australia and Tasmania dependent on Victorian coal-fired power, increased prices will flow through to these States as well, meaning Liddell's closure will affect prices throughout the National Electricity Market (NEM).

Unplanned outages and blackouts are yet another source of concern. Being dependent on high outputs would be considered risky, even with new power stations, but expecting every unit of an ageing fleet to provide full output through the hottest days of the year is a bet that rational people would not accept, especially with all levels of government publicly determined to close them early.

NUCLEAR ENERGY IS A VIABLE REPLACEMENT

With adequate maintenance throughout its lifecycle, a thermal power station—whether coal, gas or nuclear—can last far beyond their planned retirement age. Several nuclear

power plants in Canada, the US, and Europe are currently undergoing life extensions that will see them operate safely and reliably beyond 60 years.

Nuclear power stations have the additional benefit of being able to run at a very high capacity factor in a safe and sustainable manner. Regrettably, nuclear energy facilities are banned in Australia by s140A of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). A survey conducted by the Institute of Public Affairs in April 2022 found more than half the respondents wanted the ban repealed, while less than a quarter wanted the ban kept in place (the rest neither agreed nor disagreed).

Australia is in the midst of an energy and cost-of-living crisis.

Nuclear fission generates almost 70 per cent of electricity in France, 50 per cent in Belgium, 20 per cent in the United States, and 15 per cent in the United Kingdom. Nonetheless, the Australian Parliament continues to impose the ban despite ample evidence of the safety of nuclear technology from overseas and support from the Australian public. We produce enough uranium each year to power the whole country, yet we export the whole lot for the benefit of others. This makes Australia the only country to produce but not use uranium for energy generation.

Aside from nuclear energy, no other zero-emissions sources of energy are able to adequately plug the gap created by the decommissioning of coal-fired assets such as Liddell, Eraring, Vales Point, and Bayswater. This is because wind and solar energy, without firming capacity on a massive scale, cannot



Liddell Power Station, in full steam.

Photo: agl.com.au

operate when the wind isn't blowing and the sun isn't shining. In addition, bringing more wind and solar into the energy mix requires the construction of a vast network of new and expensive transmission lines.

Australia is in the midst of an energy and cost-of-living crisis. A solution is needed now. Blindly sprinting towards 'net zero' carbon dioxide emissions by 2050 is not a solution.

HAZELWOOD: THE LESSONS WERE NOT LEARNT

The average spot price for electricity in Victoria shot up by 85 per cent after the closure of Hazelwood, the last coal-fired power plant to be decommissioned. This price hike is commonly attributed to the abruptness of the announcement and the market not having been given sufficient time to transition. The Australian Energy Regulator further noted its view that the significant price increase was caused by

changes in the grid's fuel mix. Hazelwood, like other Victorian coal-fired power plants, was fuelled by low-cost brown coal, which has no export potential. An increasing reliance on more expensive sources of power such as gas and hydroelectricity, therefore, according to the AER, naturally drove up prices.

Increasing reliance on more expensive sources of power drove up prices.

On the surface, Hazelwood's experience may appear unique. But it is much more similar to Liddell's closure than it seems at first glance.

Liddell's closure will result in higher power prices and lower generation reliability.

Wholesale power prices in NSW—and in the NEM more broadly—have been increasing since the closure of Liddell was announced, and since the announcement of the early closures of other coal-fired power stations, like Eraring and Bayswater. This is because, to a considerable extent, the market expects—under net zero—that they will be replaced by more expensive sources of electricity,

namely renewables. Moreover, despite the more generous lead time between the announcement and gradual decommissioning of Liddell's four units, policy makers are in a position similar to when Hazelwood's sudden closure was announced: scrambling to find a replacement.

A key difference is that the challenge this time does not come from the short lead-time but from the market not wanting to respond to the call for replacement capacity in light of the policy of sprinting towards a switch to renewables and, subsequently, the policy of net zero emissions by 2050 at the State and federal levels.

ENERGY POLICY RESTED ON A WING AND A PRAYER

The approach of the federal and NSW governments rested on a wing and a prayer. When nothing came of it, they cobbled together a sticky tape solution, namely: the



Hazelwood Power Station, pictured at night before it was shut down.

Photo: Simpsons fan 66/Wikipedia

\$600 million gas-turbine Hunter Power Project, owned by the taxpayer-funded Snowy Hydro, at Kurri Kurri.

Kurri Kurri only received the go-ahead in December 2022. As of the date of writing, in February 2023, the construction of Kurri Kurri is still yet to commence, with first power production optimistically estimated to begin in May 2024 and full operation by the end of 2024—both targets running about a year later than first planned.

More coal-fired power generators must not be allowed to close without a solid replacement plan.

Despite the lead time, Liddell's closure will have the same outcome as the closure of previous coal-fired power generators, namely: higher power prices and lower generation reliability. IPA research, released in June 2022, 'Australia's Net Zero Energy Crisis: An analysis of the electricity price implications of net zero emissions by 2050', estimates the closures of coal-fired power stations will more than double household power bills by 2030. Since its publication, policy makers have doubled down on the rapid switch to renewables, creating further inflationary pressures because replacing traditional, reliable and affordable sources of power with renewables will not result in lower prices; it will result in higher prices—and not just of electricity, but for everything produced using electricity.

The Kurri Kurri project is the culmination of policy makers' tacit admission that wind

and solar simply cannot replace coal, and is reminiscent of the Queensland government's audacious plan to build the world's largest (5GW) pumped hydro power station in Pioneer-Burdekin, another smaller (2GW) power station in Borumba, and the associated transmission lines.

The planned hydroelectric power stations are deemed necessary, in light of the State government's commitment to close a fleet of five power stations—including Callide B, Stanwell, and Tarong—by 2035 at the latest; wind and solar simply cannot plug the gap.

THE MADNESS MUST END

The madness must end. After Liddell, more coal-fired power generators must not be allowed to close without a solid and well-considered replacement plan that can sustainably plug the gap in a cost-effective manner. The emphasis must be on like for like: base-load for base-load. This means major assets that run reliably for decades, available 24/7, with high capacity factors. Practically, this requires either investment in the new breed of HELE (High Efficiency, Low Emissions) coal-fired power plants, or nuclear energy.

Australian families should not be subjected to government policy that drags us down the path towards a new dark age.

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