



MARKET POWER MISDIAGNOSED

The closure of Hazelwood Power Station removed a significant amount of generation capacity from the National Electricity Market (NEM). A recent report by Bruce Mountain and Steven Percy concludes that large electricity generators exploited the closure to exercise market power.¹ The authors claim that this was blatant price gouging that left electricity consumers nearly \$3.5 billion out of pocket. Federal Energy Minister, Angus Taylor, immediately seized on the research as support for his “Big Stick” legislation, which would introduce draconian interventions in the NEM, supposedly to end “abuse of market power.”

Misdiagnosis?

How accurate are the authors’ claims? Is this the best explanation for the effects of the closure? These questions are critical as bad government policy should not be lent credence by equally bad ‘evidence’. Our review reveals that Mountain and Percy reached the wrong conclusions due to fatal flaws in their analytical approach. This bulletin sets out why.

The Mountain-Percy report concludes that prices rose in the Victoria and NSW regions of the NEM between 2016 and 2017, coinciding with the closure of the Hazelwood coal-fired generator. There are several potential explanations given for the observed price rise, including:

- Increases in demand;
- Reductions in supply following increased market power allowing generators to profitably raise their bids;

¹ Mountain and Percy, *The exercise of market power in Australia’s National Electricity Market following the closure of the Hazelwood Power Station*, Victoria Energy Policy Centre Working Paper, March 2019 (the Mountain-Percy report).



- Reductions in supply as a direct consequence of the highly used 1600MW Hazelwood coal-fired generator exiting the NEM and no longer supplying; and
- Other events, for example outages or rising gas prices.

Mountain and Percy attribute the price increases entirely to the most headline-grabbing explanation—price-gouging due to the exercise of market power. By doing so, they ignore more obvious and plausible explanations, such as a material physical reduction in supply. Economics 101 tells us that a reduction in supply tends to result in an increase in price – with no exercise of market power and no ‘gouging’ at all.

Extraordinary claims require extraordinary evidence. However, we show that the ‘evidence’ adduced by Mountain and Percy is extraordinarily flawed.

Key problems

There are many shortcomings in the Mountain-Percy report. However, there are two key flaws, which invalidate the report’s findings.

First, the authors have made several serious mistakes in interpreting the bid data provided by AEMO. This misinterpretation alone is sufficient to invalidate their conclusion that the price increases observed are due to the exercise of market power.

Second, the approach, focusing on prices during periods in which coal-fired generators set the market price, is conceptually flawed. It attributes the entirety of the price increases to *changed bidding behaviour*, rather than to the direct impact of the Hazelwood closure on market supply. In fact, their approach would find increased prices and market power even if no generators changed their bidding behaviour at all.

Misinterpretation of the bid data

The Mountain-Percy report purports to show the bids of NSW coal-fired generators.² That is, the volume of production and prices at which capacity is offered to the market. However, we contend that the authors made a number of serious errors when interpreting the bids of NSW coal generators. These are outlined below.

Figure 1 below, reproduced from the Mountain-Percy report, suggests that the Liddell Power Station appears to offer a constant 2200MW every day for all three years despite maintenance and outages, and similarly for the other stations.

Figure 1: “Bids” of Liddell

Figure 7. Liddell Power Station (AGL)



Source: *The Mountain-Percy report*.

Evidently, the capacity the authors consider as bid at “>\$5000” is actually the nameplate capacity of the station subtracting the capacity that is bid at prices of \$5000 and lower. The authors are assuming that any capacity not offered at \$5000 or less is offered at a price greater than \$5000, *even if it is not offered at all*. This is not appropriate. There are instances when some capacity was not offered into the market at all by some generators (perhaps because the plant was undergoing maintenance work, or due to technical reasons was unable to run at full capacity). However, Mountain and Percy assume that in all such instances the capacity was

² The Mountain-Percy report, Figures 6-10.



offered, but at exorbitant prices. By way of analogy, there is a material difference between a store pricing bottled water at \$100/litre during a state of emergency, and simply selling out of bottled water.

Clearly, treating non-bids falsely as extremely high bids would skew the analysis. This would make it appear as though the generators had gouged and would be entirely misleading.

A second major error in the treatment of the bid data is that the authors appear to have failed to consider the *maxavail* bid parameter submitted by generators to AEMO. This parameter limits the capacity offered to the market by the generator, and so any proper interpretation of bid data must take this limit into account. For example, suppose a generator offers 500MW at \$0, an additional 200MW at \$40 and an additional 200MW at \$60, but has 600MW as the *maxavail*. It follows that the bids should be interpreted as 500MW at \$0 and an additional 100MW at \$40, and no more regardless of the price; 600MW is the maximum available.³

When Frontier Economics analyses bid data, we account for *maxavail* and, in doing so, we see a reduction in capacity offered to the market by Liddell around April 2016.⁴ But Mountain-Percy show no such reduction in capacity as the reduction in *maxavail* has not been acknowledged. This explains the small capacity delivered by Liddell at the time, less than 250MW as shown in **Figure 1**, despite Liddell supposedly offering 1000MW at negative prices. Unless the market clearing price was negative in most periods, it would not be possible to offer so much capacity at negative prices yet deliver so little.⁵ As

most energy economists are aware, spot prices are rarely negative, especially when a coal generator reduces capacity to such a large degree.

Misreporting capacity not offered to the market as offered at prices above \$5000, and failing to incorporate the *maxavail* parameter, leads to misleading bid data. This is especially so with an ageing station such as Liddell, well known for suffering outages and limits to capacity. In fact, AEMO modelling applies a 50% capacity factor to Liddell. This reflects the fact that Liddell simply cannot run at high loads for extended periods of time. Furthermore, AEMO assumes that capacity has been reduced to 1800MW from the nameplate capacity of 2000MW.⁶ These adjustments in the modelling of AEMO partly explain the bidding behaviour of Liddell: it runs more often to compensate the market for the loss of Hazelwood.⁷ However, because of the increase in prices (due to basic supply and demand dynamics) it would find itself running too heavily if it failed to adjust its bids. It must adjust bids. To fail to do so would be harm the reliability of Liddell and indeed the NEM.⁸

Ignoring the most obvious explanation

In determining the impact of the exit of Hazelwood on prices, the Mountain-Percy report focuses “only on those times that coal generators set prices.” The authors claim that “[t]he impact of the change in the prices offered by the coal generators can be expressed in the weighted average spot prices in each market when coal generators set the spot prices.”

³ Why wouldn't the station simply change their bid to 500MW at \$0 and 100MW at \$40? Changing the *maxavail* parameter already accomplishes this (barring misinterpretation by non-experts) and conveys to AEMO the relevant information.

⁴ So does the AER – see Figure 1 of the AER's NSW electricity market advice – December 2017, which notes the Liddell outage.

⁵ This gap is also present at other times for Liddell, and for Mt Piper in Figure 9 of the Mountain-Percy report.

⁶ AEMO, 2018 Integrated System Plan - Modelling Assumptions.

⁷ This is especially true during the afternoon peak period. See Figure 16 of the Mountain-Percy report.

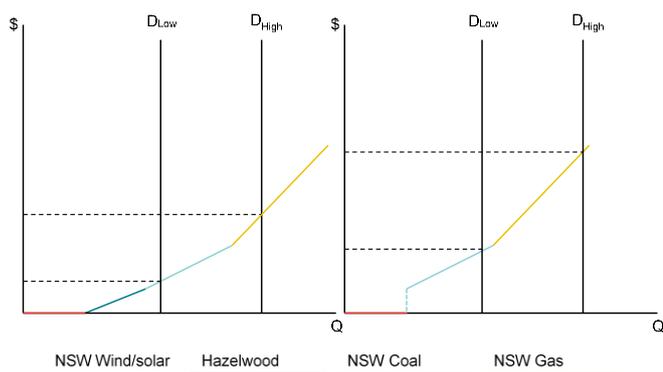
⁸ Even a benevolent social planner would increase bid prices to ensure efficient allocation of scarce resources in response to an increase in expected electricity prices. For an application of this concept to stored hydro generation in New Zealand, see Evans et al, *The role of storage in a competitive electricity market and the effects of climate change*, Energy Economics, 2013.



This is highly misleading. It attributes the entirety of the change in average spot prices during these periods to the bidding behaviour of coal generators. That is, it is ignoring the impact of removing a large amount of low-price capacity.

As a simple example, **Figure 2** compares a market in which low priced generator Hazelwood is providing capacity, and one in which it is not. It is evident that when examining the periods when coal sets the price (i.e., when demand is low), the average price is considerably higher if the Hazelwood capacity is removed: we move up the supply curve. So, even if there were no change in the bids of any generator we could see the price changes observed by Mountain-Percy.

Figure 2: Supply and demand



Source: Frontier Economics analysis

Does this explanation match the data? According to Mountain and Percy, yes.⁹ Comparing 2016 to 2017, it appears that there is less spare capacity on average during these so-called coal periods in 2017. As a consequence of Hazelwood closing, the market spends more time on the upper section (high price) of the coal-fired portion of the supply curve. It is straightforward to see that this in itself would result in higher prices.

There is no need to assume that bidding changes drive price changes when simple supply and demand adequately explains the data.

⁹ See Figure 20 of the Mountain-Percy report.

Conclusion

Allegations of the misuse of market power have previously been considered by the Australian Competition and Consumer Commission (ACCC) and the Australian Energy Regulator (AER). Neither of these regulators identified any misuse of market power. That is quite telling about the reliability of the conclusions reached by Mountain and Percy.

The ACCC and AER avoided the mistakes in interpreting the data that Mountain and Percy have made.

Mountain and Percy have attributed the observed price increases to the most extreme and alarmist of many possible explanations. The most plausible explanation for the price rises following the Hazelwood closure is perfectly consistent with competitive, efficient markets. Mountain and Percy would have done well to apply Occam's razor: the simplest explanation, requiring the least speculation, is usually the best.

The numerous methodological and procedural flaws in the Mountain-Percy report leave the evidence well short of that required to allege serious wrongdoing by market participants. Certainly, the report does not provide any suitable justification for the government's misguided interventions in the NEM.



Contact Us

Frontier Economics has been providing independent advice to businesses, regulators and governments for 20 years. From offices in Australia and Singapore, our team has a diverse range of skills and experiences to support the needs of our clients and includes specialist econometricians and modellers.

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