

The [ongoing uncertainty](#) over the future of the Hazelwood power station in Victoria's Latrobe Valley has raised the prospect that the ageing generator will be shut down in the near future.

The power station has a nameplate capacity of 1.6 gigawatts, which represents 22% of the coal-fired generation capacity in Victoria, and 6% of the total coal-fired capacity in Victoria, Queensland and New South Wales combined (South Australia no longer has an operating coal-fired power station).

Coal-fired power stations provide the bulk of the "baseload" electricity requirements in the [National Electricity Market \(NEM\)](#)

. Baseload refers to generation that meets the minimum demand, and from an economic point of view this is best delivered by generation that produces constant, reliable output. Brown coal provides the cheapest baseload power – or at least, it does if we're prepared to ignore factors such as the long-term costs of climate change.

So if Hazelwood departs the market, as one of the cheapest generators in the NEM, it seems logical that electricity prices will increase. The extent of that increase will depend on what takes up the slack. So what can we expect to happen?

On the decline

Until 2007, average electricity demand in the NEM had increased every year since the grid was first built. But after that demand started to fall. The [reasons are varied](#), including increasing takeup of rooftop solar panels, improved efficiency of lighting and appliances, and reductions in industrial demand.

Looking at July (when baseload electricity demand is typically at its highest), the average demand has fallen from 25.4GW in July 2007 to 22.9GW in July 2016, a reduction of 2.5GW.

But there has also been significant retirement of coal-fired generation capacity in Australia since 2010, driven partly by the retirement of old power plants, and partly by the costs associated with the carbon price, which ran from 2012 to 2014.

Hazelwood's closure won't affect power prices as much as you might think

Written by Roger Dargaville, Deputy Director, Melbourne Energy Institute, University of Melbourne

The retirees include Morwell and Anglesea in Victoria (0.2GW), Playford B and Northern in South Australia (0.8GW), and most significantly Redbank, Wallerawang and Munmorah in New South Wales (2.5 GW). This adds up to a total of 3.5GW of coal-fired capacity shut down this decade.

This means that more capacity has been retired than the baseload demand has decreased. So in theory, the retirement of another baseload power station at Hazelwood would result in even more tightening of the balance between supply and demand.

But if we look at the current average capacity factors of the remaining coal-fired power stations we can see that many of the larger ones, in NSW in particular, are running at very modest capacities. For example, Liddell has been running at 43% of its total capacity for the past 12 months, and Eraring at 59%. Across the NEM the average is 65%.

Now, of course some of this generation is used when the demand increases during particularly hot or cold weather, but most of this “peaking” demand is supplied by hydro and gas. So while baseload is not the only way to meet demand in the energy system, there nevertheless seems to be plenty of baseload available.

Why are coal-fired stations running at such low levels? One reason is that while demand has been falling, there has also been an extra 4GW of wind power capacity added to the grid. Meanwhile, several new plants were commissioned in the years leading up to the peak in demand, with the expectation that demand would continue to rise. These plants include [Callide C](#), [Mil Imerran](#) and [Kogan Creek](#), which add up to 2.7GW.

If Hazelwood shuts down, it would be reasonable to expect that the remaining coal-fired generators in the grid will take up the slack. The generators in Victoria are running at relatively high capacity factors, so we might expect that NSW generators will increase their output. The interconnector between Victoria and NSW currently sends Victorian electricity into NSW, but it can reverse that flow if required.

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One reason why Victorian power stations are running at higher capacities is because they are cheaper to run. ACIL Tasman figures from 2010 show short-run marginal cost (the cost to run a power station in addition to fixed costs) in Victoria is around A\$2-5 per megawatt hour, compared with A\$12-17 per MWh in NSW.

Predicting what will happen to electricity prices in the future is harder than picking the winner of the Melbourne Cup, so making an exact price forecast is tricky. But if the hole left by Hazelwood's retirement is filled by the excess capacity in NSW, then all things being equal the impacts on the overall costs of running the system would be modest.

Still, the NEM is very complex. Generators (especially in Victoria) are privately owned and will adjust their market strategies to take advantage of the tightening of supply. Meanwhile, the growing market share of renewables, the potential for electricity demand to begin rising once again, and the possibility of further coal closures, all mean that the full impact of the retreat of coal-fired power is yet to be seen.

Roger Dargaville has received funding from the Australian Renewable Energy Agency

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