

Solar puts heat on gas, coal

Pressure is on the government to ease the stress on our power grid.

Ebony Bennett



If you think summers are getting hotter, you're right. Just look at Australia's gas and coal power plants, which struggle to cope in the heat. Here's why extreme heat is the greatest threat to the security of eastern Australia's electricity supply.

First, global warming means extreme heat events are the new normal for Australia. The Bureau of Meteorology says the number of days each year when the average temperature is "extreme" is increasing. We're talking the types of days where parts of the Hume Highway literally melt in the heat. In 2013, there were 28 extreme-temperature days; before 1950, more than half the years had zero extreme days.

Without the effects of global warming, the record-breaking February 2017 heatwave would be considered a one-in-500-year event. If global temperatures reach 2 degrees above pre-industrial levels, possibly as early as 2050, summers this hot will become a one-in-five-year event. And with Australia's emissions rising for the third year in a row, the Coalition government isn't doing anything effective to address our contribution to global warming. So we can expect extremely hot days more frequently.

Second, like polar bears, gas and coal-fired power stations don't cope well with the heat. Thermal electricity generation, including thermal coal and combined cycle gas, require cooling to function. In heatwaves, cooling obviously becomes difficult and many

power stations fail to produce at their full capacity, or they "trip" and fail.

On January 7, when temperatures soared to 47.3 degrees in Penrith, the ageing Eraring coal-fired power station tripped, dropping about 275 megawatts in the space of 10 minutes – essentially at the same time everyone had their air-conditioners and fans turned to maximum.

The Australia Institute monitors when gas and coal-fired power stations trip, often dropping hundreds of megawatts of power from the grid within minutes. The "gas and coal watch", on the institute's website, shows Victoria's Loy Yang A coal-fired power station tripped seven times in the past month. Queensland's Milmerran coal plant tripped on New Year's Day, dropping 155 megawatts, Tarong Power Station dropped 314 megawatts of generation on December 28, while Gladstone power plant tripped and lost 229 megawatts on Christmas Day.

And it's not just ageing plants. Kogan Creek is Australia's second-newest coal power plant and it broke down for the second time in a month on January 11, taking 700 megawatts off the grid. Kogan Creek is one of Australia's few supercritical coal-fired power plants – you know, those ultra-supercritical plants the Minerals Council talks up regularly. It turns out they aren't so super in the heat.

Last summer, Australia Institute research showed 14 per cent (3600 megawatts) of coal and gas generation failed in the February heatwave.

In South Australia, 17 per cent of gas-powered generation was unavailable during the peak demand period that led to the blackouts on February 8. In NSW, 20 per cent of coal and gas generation failed to deliver during the peak demand period on February 10. In Queensland, 7 per cent of coal and gas generation was withdrawn in the four hours leading to peak demand on February 12, due to

technical issues, mostly (and possibly entirely) due to the heat.

We need a heat-resilient electricity grid. And consumers and business want a reliable grid that doesn't dramatically increase their power bills. Here's the good news: the best options aren't the most expensive.

A heat-resilient grid means we need more demand management. It's cheaper than building a new coal-fired power station.

We need more storage. The world's biggest Tesla battery, in South Australia, spent its first month of operation showing off how quickly it can swoop in – we're talking milliseconds – to support the grid, including disturbances caused by the

failure of a coal power unit almost 1000 kilometres away. Unsurprisingly, Victoria is now getting its own battery; other states surely won't be far behind.

Australia is woefully behind on investing in large-scale solar generation, though we are catching up. The million-plus households with rooftop solar play a crucial role in reducing demand, as households draw power for their air-conditioners during heatwaves, instead of increasing the load on the grid.

South Australia is building a 150-megawatt solar thermal power plant that can store and dispatch over 100 megawatts at full output for eight hours. Its dispatchable energy is two-thirds the price of the gas-peaking plants it competes against.

During the February 2017 heatwaves, solar delayed reaching the critical peaks that led to blackouts and load shedding by several hours in all three states. Imagine the crisis that would have been experienced if all those demand thresholds had been crossed hours earlier and gone for hours longer. Solar saved the national energy market's bacon on those days, and will be increasingly critical as we enter a new era of unprecedented heatwaves.

Luckily, while the cost of gas has



exploded, the cost of renewables and battery storage is falling fast. That's good news for consumers and business. However, the Coalition government wants to impose a reliability guarantee on retailers that would require them to buy "dispatchable" (ie gas and coal) as part of its draft National Energy Guarantee. But how much extra back-up will the government require for power from these unreliable clunkers that fail in the heat?

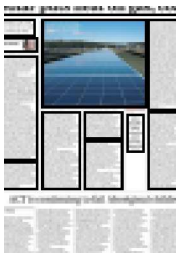
The government should also require "heat-safe" back-up for coal and gas plants. If it doesn't, you could conclude that the NEG is designed more to hobble renewable energy industry than guarantee the least-cost reliable low-emissions electricity grid.

All this makes the SA's big battery, and the ACT's decision to go 100 per cent renewable by 2020 and build a battery of its own, look sensible.

Gas and coal not only struggle in the heat, they worsen global warming. On sunny days, batteries thrive and solar shines. It's a no-brainer.

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