Committee Secretary

Senate Standing Committees on Environment and Communications

Re: **Nuclear Power Inquiry**

Submission in support of nuclear power

Re the NEM, I have reviewed the power generated per fuel type on a half hourly basis from 1/1/2020 to 1/8/2022 from a spreadsheet provided by AEMO.

For many 12 hour periods the amount of power generated by grid solar, rooftop solar and wind has been less than 10%, often around 6%, and for some 6 hour periods it was less than 1%. Under these conditions (no meaningful wind or sun) no number of panels or wind farms will make a meaningful difference.

NEM's first grid battery at Wallgrove has 75MWH storage. Average NEM daily demand is 550 GWH, ie on an average day that battery could supply the grid for 11.8 seconds.

Add more batteries, more pumped hydro. But flat batteries and empty dams cannot supply power and when they need to be recharged then both the grid and recharging have to be provided for. From the spreadsheet I have reviewed (>45,000 lines of data) low solar/low wind days generally come in groups. You could rationally draw the conclusion we would need to double our generating capacity to supply the grid and recharge batteries or pump-up dams. And that is with no growth, noting that should half our road transport go to EVs or hydrogen this alone would increase demand by about 40 percent.

Almost everything we do – all communications, hospitals, trains, high-rises, industry, all transport (EVs or not, petrol has to be pumped, airports) the list goes on – depends on power, depends on reliable power.

Eventually, with carbon capture and storage and geothermal, the problem may be solved, but I believe that will be way beyond the desired time frame.

Assuming coal powered stations are closed down, the only technology we have at present that could reliably meet demand and recharge batteries etc is gas, and when it is needed (there being next to no C-free power either from alternatives, batteries or pumped hydro) it could well be at near enough to total grid scale. That is capacity would have to be huge but demand small, intermittent, unpredictable and predictably declining. How is something of that scale with a small, declining but at time very large demand going to be financed? Who is going to pour $billions into searching for and developing gas, especially in this political climate of what could be described as a visceral hatred of the industry?

Given that we must, and I emphasise 'must', reduce our carbon emissions, the remaining and inescapable logical choice is nuclear. Based on 'alternatives' and nuclear the UK, even under a conservative government, plans to achieve C-free power generation by 2035, under a Labor government by 2030. Neither could possibly, not remotely be achieved without nuclear.

Hesitation to embrace nuclear and the opposition to gas can only result in prolonged use of coal. Coal is by far the worst fuel. On mining coal methane emissions are high (IEA estimates of the order of 1.8 million tonnes/year, equivalent to approximately 150 mt/y CO_2 refer https://www.bbc.com/news/world-australia-61727940) , burning coal emits some 40 percent more CO2 than gas, and unlike gas which can effectively be switched on/off to meet demand, coal burns 24/7.

A number of small nuclear reactors are in the development stage and are planned to be delivered in modular form. I find it most difficult to recommend nuclear, but doing the numbers and wishing to reduce C-emissions, I have not been able to arrive at a different conclusion. I would be delighted to be shown where I have erred.

It is with a certain reluctance then that I support transitioning to nuclear power

Peter Lane,

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