

# NBR Guest columnist: Preparing for a dry year in power generation

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Transpower has just released its 2017 Security of Supply Assessment that indicates security of electricity supply could be at risk from dry hydro years after 2022.

A review indicates many of the assumptions are unrealistic, raising serious worries about the ability to survive a one-in-20 dry year.

A dry year brings electricity shortages and blackouts that do far more damage to the economy than to the electricity industry. The political fallout will be huge. There's a serious risk politicians will panic and take actions that will do little to solve the underlying problem.

One of the reasons for building the Huntly coal-fired station was to ensure sufficient energy in a dry year. The last serious dry year was 1992 when it rained only a week or two before major power cuts would have been needed in the South Island.

Huntly was running all four sets and other thermal stations were brought back from mothballing. These stations no longer exist.

From the beginning, the public was asked to make savings and this reduced demand by at least 10%. Under the new rules, the industry must make massive load reductions before a public conservation campaign is initiated.

### **Risk delegated**

The Electricity Authority (EA) has delegated the job of establishing a dry year risk to Transpower and provides it with a set of guidelines, one of which states, "All thermal generation should be assumed to be fully fuelled (that is, their ability to contribute ... is not restricted by fuel availability constraints) unless there is credible information to the contrary."

It should have stated, "The study should establish what stations can provide additional energy during a dry year, how much fuel they have available and whether they can be expected to operate reliably for several months on end."

If it had done so the Transpower assessment would have concluded that, right now, the dry year risk is real and, possibly, severe.

The EA guidelines indicate Transpower should assume Huntly has the one million tonnes of coal needed to enable it to generate at full capacity for six months on end.

It doesn't: it's public knowledge the stockpile has only 360,000 tonnes. The assessment should also assume a number of gas-fired stations will have an adequate supply and will be available during autumn and winter. Yet most gas contracts are inflexible, some gas turbines are unreliable and the power stations associated with dairy factories must shut down in the autumn.

The conclusion is existing thermal power stations cannot generate the dry year energy that, according to the EA, Transpower should assume to be available.

### **Recent expansion**

It would be beneficial if the recent expansion in wind and geothermal power ameliorated the dry-year risk. Sadly, this is not the case.

Wind power drops about 10% during the autumn and early winter and geothermal power runs at full power virtually all the time so it cannot generate any more during a dry year.

Although there may well be some spare gas available, the sellers usually insist it be taken at a steady rate rather than held in reserve for dry years.

In 1992, a lot of extra gas was extracted from the Maui field. This option is no longer available. The dependence on the Huntly coal stockpile is, if anything, greater than before.

The Transpower assessment examines the possibility of sufficient power available to avoid blackouts over a peak demand period. Unfortunately, the EA instructions lead to an estimated peak demand that could be well below the actual peak demand on a cold night: The probability of blackouts is greater than estimated.

The report also indicates that only a small amount of reserve power is available and there could be serious problems with meeting peak demand after 2022. Once again, reality could be worse than the assessment leads us to believe.

If more realistic assumptions are made for the amount of reserve energy available, then the system is at increasing risk. If, as is quite possible, Huntly shuts down in 2022, the risk becomes high indeed and there's no chance a replacement station could be commissioned by then.

Therefore, from a national point of view, Huntly must not shut down in 2022 and must always have a substantial stockpile of coal.

### **What the market needs**

The electricity market should put a value on all three components of a reliable and economic supply:

- an adequate supply of energy (kWh) in the medium and long-term: the existing market provides it in the short-term;
- an adequate supply of capacity (MW) to meet the system peak demands; and
- a supply of reserve energy sufficient to get us through a dry year.

The EA assumes the electricity market will ensure that an adequate supply of MW and reserve energy even though the market does not provide any inducement to do so.

This bold assumption may be tested soon. If the EA is wrong, the economy could be severely damaged.

The government should immediately insist the Transpower assessment be repeated based on the amount of reserve energy actually available and have it independently reviewed.

If the new study confirms the risk is real, then the government should find out why the market has failed and remedy it.

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