



Consultation
on
2021 Dry Year Event Review

Submission by Electric Power Optimization Centre
The University of Auckland

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January 25, 2022

1. EPOC welcomes the opportunity to make a brief submission on the 2021 Dry-year event.
2. The Martin Jenkins report "2021 Dry Year Event" (MJ) gives a reasonable account of the events of 2021 and the current institutional arrangements for signalling this. The report is based on interviews with market participants. The report is light on the technical details and assumptions underlying the risk curves and how they are computed. It is important that these are communicated and understood by market participants.
3. The MJ report identifies a lack of clarity about levels of risk, and who should decide these. A key theme is the industry's response to the political uncertainty arising from potential government intervention when lake levels are low. In this environment, market participants are likely to act with more risk aversion than is warranted to avoid the perceived need for intervention.
4. Regulatory intervention is stimulated by high prices paid by consumers when the risk of shortage increases. The MJ report (like many previous reports on this subject) states that increases in price to signal shortage is a sign that the wholesale electricity market is working properly. This is a necessary but not sufficient indicator of market health.
5. Consumers are concerned that price levels signalling shortage might be higher than competitive levels. There are several possible causes of this. In the context of security of supply, generators might bid their offer prices up until they match a level that induces a demand response. This is generally not the optimizing behaviour of a generator in a perfectly competitive market¹.
6. It is important that the issue of competitive pricing be resolved by rigorous market monitoring (as discussed in the Electricity Authority recent consultation). If all parties generally agree that wholesale prices are competitive then the Government will be less susceptible to lobbying for intervention.
7. Prices will respond to risks that include uncertainty from reservoir inflows, fuel availability and cost, wind and solar energy supply, and carbon charges. EPOC's JADE model² can compute competitive prices for electricity supply subject to these uncertainties, under an assumption of risk aversion of a social planner. This will match the outcomes of risk-averse agents who can trade their individual risks using market instruments³.
8. The risk curves computed by Transpower assume a fleet of thermal generation to run at capacity when lake levels hit appropriate thresholds. As New Zealand decreases the capacity of this non-renewable generation, the risk curves will require detailed models of renewable generation and its probabilistic generation profile as well as a detailed model of demand response. These models and the assumptions underlying them should be publicly available.

¹ The optimal offer is at marginal cost, which will be fuel cost or marginal water value. When a shortage of energy is imminent the perfectly competitive marginal water value could be equal to the minimum marginal utility of current consumption, but the former is generally much lower.

² JADE is described in more detail in EPOC's submission on the EA consultation "Market Monitoring Review".

³ Assuming complete markets for trading this risk.