

A Response to the Wolak Report

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Who We Are

The University of Auckland hosts both The Energy Centre and the Electric Power Optimization Centre. The former is attached to the Department of Economics, and aims to provide an independent and balanced authority on New Zealand's energy priorities and initiatives. The latter is attached to the Department of Engineering Science, and uses mathematical modelling, optimization and statistical tools to comprehend modern electricity markets such as the NZEM, and to analyze and develop methods for efficient generation schemes and demand-side participation¹. The following is a joint first response to the recently released Wolak report.

Our Response

Professor Wolak's report is a very careful and thorough analysis of market power in the wholesale electricity market and we agree with the bulk of his conclusions. In particular we agree that there is evidence of unilateral market power in the New Zealand wholesale electricity market and this market power is exercised primarily during dry years. As he points out, water shortages are the major reasons firms are able to successfully sustain higher spot prices. This is yet another reminder that New Zealand faces significant energy insecurities due to repeated dry year events.

However, we disagree with Professor Wolak's assumptions in calculating market rents in dry years. In his report, Professor Wolak has chosen competitive benchmarks in which either hydro-electricity dispatches are fixed, or the opportunity cost of water is set equal to the marginal cost of the highest-cost thermal generator. Drawing on an analysis of the California electricity market in the American Economic Review, he claims that these models of hydro-electricity costs overestimate the true opportunity costs. However, in the New Zealand setting, we believe this is incorrect, because it ignores New Zealand's likelihood and resulting costs of running out of water. Whereas California always has the option to import electricity from other states, New Zealand faces rolling blackouts and considerable economic losses if hydro lakes run out of storage. In the face of shortages, the (risk-neutral) opportunity cost of using water today must account for the probability of a blackout in the future and the economic cost of that blackout (often named the Value of Lost Load). The California paper Wolak cites does not make any estimate of shortage costs, yet these shortage costs are likely to be higher than the marginal cost of thermal generation. As water levels fall, the probability of incurring these costs will rise to a point where the expected opportunity cost of water will exceed the most expensive thermal plant. If this is correct, then the Wolak report overstates the amount of market rents during dry years.

¹ For more information about us, visit our websites, respectively <http://www.energycentre.auckland.ac.nz/> and <http://www.esc.auckland.ac.nz/epoc>.

We also take issue with the interpretation of the Wolak report's estimate of \$4.3 billion in market rents. The media has claimed that this represents a transfer of wealth of \$4.3 billion from consumers to generators. This is a misinterpretation of the results of the analysis. Wolak himself, on p173 note 313, cautions that these figures relate only to the wholesale market. Market rents are a measure of the difference between spot prices and generator costs. Most consumers do not pay these spot prices. During dry years, the actual retail price consumers pay is well under the spot price. In theory, the retailer will turn around and pay the generator the spot price, but since they are vertically integrated, this amounts to an internal transfer of funds between different arms of the same company, with zero net effect. Generators will typically have other fixed price contracts in addition to retail load, so in practice they will only receive market rents as actual earnings for some fraction of their generation². Thus the true transfer of wealth from generators to consumers during periods of high wholesale prices is likely to be much lower than Wolak's estimate of market rents, even ignoring the way he estimates hydro costs. It may be the case, as Professor Wolak speculates, that high spot prices during dry years will be passed onto consumers in the form of higher retail prices in the future, but this has not been established conclusively by his report.

Likewise caution is warranted when claiming that recent retail price rises (residential as well as commercial/industrial) are attributable to these market rents. As underlying input prices have risen significantly over the last decade (e.g. gas from NZ\$ 3.14/GJ in 2000 to NZ\$ 6.3/GJ in 2007), even in a perfectly competitive market, wholesale and retail electricity prices would have risen significantly. More analysis is needed to attribute these price rises to underlying drivers. The dataset that was gathered by the Commerce Commission for the Wolak report should make this possible.

At the University of Auckland, we will be working on refining the cost estimates contained in the Wolak report, and identifying resulting issues and possible market improvements.

(Ends.)

² The exact proportion of contracted load is redacted from the public version of the Wolak report.