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By email

Dear Nalin

**RE: Methodology for Assessing Competition Benefits**

AEMO welcomes the opportunity to provide feedback to the proposed methodology for assessing competition benefits for Powerlink's and TransGrid's proposed QNI upgrade as per the consultation paper "Development of the Queensland – New South Wales interconnector: Methodology for assessing competition benefits, Powerlink and TransGrid, April 2013.

Any estimates of competition benefits, even when following a well-established procedure, are subject to a number of uncertainties arising from:

- Assumptions needed, including:
  - Future contract positions
  - Ownership of future generation
  - Demand elasticity
- Methodology applied, including:
  - Choice of methodology
  - Noise from non-optimal solution
  - Noise from random sampling of outages

As a consequence of this, many studies which have assessed competition benefits have shown "negative" competition benefits<sup>1</sup>. While this is theoretically possible, it is surprising that so many studies show that – and the ability to assess competition benefits reliably comes in doubt.

A significant contribution to the uncertainty is from the results being highly sensitive to a number of assumptions. But the choice of methodology is also a factor. When network constraints are applied, it has been shown that, even for relatively simple networks, different

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<sup>1</sup> The presentation "Assessing competition benefits of interconnectors – established science or academic playground" by M. Hindsberger, IAEE International Conference, Perth, June 2012 showed that was the case for 6 out of 12 studies available, which assessed competition benefits of a proposed transmission augmentation.

methods will estimate different (and sometimes negative) levels of competition benefits.<sup>2</sup> This includes both Cournot and supply-function equilibrium models.

### **Comments on proposed study assumptions and approach**

AEMO has the following comments on the proposed approach and assumptions:

Backcasting: In order to gain confidence in a model with dynamic bidding, it is important to show the model gives reasonable results (price duration curves and interconnector transfers) for a number of historical years. In particular, this is useful to calibrate the assumptions for contract positions and demand elasticity for the initial year.

Demand elasticity: The suggested approach for QNI seems to apply a long-term elasticity in a short-term (hourly) model. This appears conceptually inconsistent though, as commented above, backcasting will show whether this assumption can provide realistic price outcomes. On the other hand, basing the analysis on short-term elasticity only (which is basically inelastic) could limit the benefits substantially. An alternative approach would be to adjust the annual energy (rather than hourly demand) iteratively using the estimated long-term demand elasticity response to simulated price changes.

Sensitivity studies: It is important to study a range of future outcomes to test the sensitivity of the conclusions to key assumptions – particularly if the competition benefits are a significant component of the total market benefits. A key assumption that warrants sensitivity studies is the future ownership of generation. Will new entry generation be owned by existing dominant portfolios or by price-taking portfolios (the so-called competitive fringe)? Either extreme should be analysed.

Noise: To assess the potential problem with noise, the quality of the solution should be assessed (if possible). Some relevant questions are:

- How close are the results using the proposed methodology and modelling tool to the “true” optimum?<sup>3</sup>
- What is the potential impact on differences between solutions (in \$millions) that has met the termination criterion at different levels from the true optimum?

To reduce the problem it is recommended to undertake this part of the analysis without random outages and other random variables.

Magnitude of competition benefits: The risk of regulatory intervention poses an upper limit to the amount of competition benefits. The risk of regulatory intervention, such as increased market surveillance and changes to the market design, prevents firms with a dominant position to raise prices beyond what will be considered unacceptable. As result, estimates of competition benefits should be checked for reasonableness.

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<sup>2</sup> See e.g. Eske Stig Hansen (2010): “Essays in Electricity Market Modeling”, PhD thesis, Aarhus University, Denmark.

<sup>3</sup> In an integer model this is measured as the integer gap and often used as termination criterion. It is unclear if a similar metric exists for the proposed algorithm.



If you have any questions please do not hesitate to contact Magnus Hindsberger, Specialist, on (07) 3347 3041.

Yours sincerely

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