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Dear Anton

Review of the Electricity Security of Supply Policy

Introduction and purpose

1. Vector believes security of electricity supply is a key issue for New Zealand and welcomes the opportunity to comment on Castalia's review of the Electricity Security of Supply Policy. Vector supports the process adopted by Castalia in undertaking its review – interviews and verbal submissions are an effective supplement to written submissions. The purpose of this submission is to reinforce Vector's high level principle views (many of which were provided to Castalia in an interview in January 2007) in relation to the security of supply policy. Where appropriate, we have commented in more detail on the assumptions and analysis adopted by Castalia in their review.
2. The GPS requirements for the review state that the focus should be on "the efficiency and effectiveness of the reserve energy policy in meeting the Government's security of supply objectives while minimising distortions to investment incentives".¹ At a high level Vector believes the Government needs to reconsider its security of supply objectives - particularly with the development of the New Zealand Energy Strategy which indicates an increased renewables-based future. Our view, as outlined below, is that the security of supply policy needs to be significantly reformed to take into account security of supply across the wider energy supply chain.

¹ Government Policy Statement, October 2006, Para 65.

Summary of Vector's views

3. Vector's key views are summarised below:

- Vector acknowledges that the focus of Castalia's review is limited to reserve energy arrangements; however, we believe that the security of supply definition needs to be reconsidered to create a 'system' definition of security of supply. This would improve accountability and transparency in relation to security of supply and help mitigate the risk of failures associated with capacity adequacy or operational/technical issues by ensuring better understanding of all relevant issues;
- In line with this, Vector submits that the review of the optimal security standard needs to consider the implications of a significant renewables-based (particularly variable wind) future. The current 1-in-60 year dry year security standard may not sufficiently capture the risks to security of supply and instead may be better expressed as a percentage probability of ensuring security of supply; and
- Vector believes that any reform of the reserve energy policy should place obligations on retailers to procure/demonstrate sufficient generation capacity and fuel stocks to meet an appropriately defined security standard. This would better ensure an optimal plant mix to meet demand, rather than procurement by the EC on a just-in-time basis for security of supply.

Defining security of supply

Holistic energy supply chain definition

4. Vector believes it is important that as part of the development of New Zealand's energy strategy there is further consideration of what is meant by security of supply (and how this relates to the optimal security standard outlined below). Vector's view is that an optimal security of supply definition cannot consider energy adequacy in isolation from capacity adequacy and other technical/operational aspects of security.
5. The development of security of supply requirements across the energy supply chain are currently developed in isolation, and are therefore inconsistent in

places. Vector's view is that obligations for security of supply should be clearly assigned to the appropriate parties across the supply chain best managed to bear the particular risk.²

6. Vector acknowledges that New Zealand faces a unique "energy adequacy" risk due to the high reliance on hydro however we believe that transmission "capacity adequacy" is increasingly becoming a significant risk. The nature of New Zealand's electricity system is such that any significant failure of the transmission system creates high risks of load shedding and because of the erosion of capacity in the transmission system, regions such as Auckland can also be exposed to voltage stability problems if generation is not available within the region – either due to climatic conditions or thermal availability.
7. Vector believes that "insecurity of supply" can be caused by factors outside of those identified in Castalia's paper³: lack of generating capacity; lack of energy; and lack of transmission or distribution capacity. In particular, there are a range of technical and operational factors that contribute to quality, resilience and reliability of supply. As an international example, the investigation into the recent blackout across Europe in November 2006 identified the cause as an "operational oversight" caused in part by some legal and regulatory framework shortfalls.⁴

Renewables and security of supply

8. In Vector's view, a significant renewables-based future (as envisaged by the draft New Zealand Energy Strategy released for consultation in December 2006) is likely to require a different approach to defining security of supply. In particular, a significant wind-based future will need to take into account the additional transmission capacity to deliver remotely generated supplies to consumers. It also needs to ensure sufficient system diversity and flexibility to respond quickly to variations in wind speeds. This clearly has implications for reserve requirements and definitions of security standards.

² Just as distributors and Transpower are required to provide line services to meet demand, Vector believes generators should be required to provide energy to meet demand, up to a defined security standard.

³ "Electricity Security of Supply Policy Review – Consultation Paper for the Electricity Commission" March 2007. Section 3 pg 25.

⁴ Despite this, the EU called for more transmission investment in light of the blackout.

9. Although Vector understands it is outside the scope of Castalia's review, a review of security of supply levels should take into account broader dimensions of security, including the requirements for system operation in a more complex, variable supply market, where wind variability must be carefully managed (including local voltage stability which may become an issue in particular regions).

Development of demand side services

10. In the draft New Zealand Energy Strategy (Dec 2006), the Government has clearly expressed its strong support for the development of the demand-side as a key to enhancing security of supply in New Zealand's future. Vector believes there is a significant opportunity to increase activity on the demand-side of the market but believes that to date, consumers and providers of equipment have not been informed or incentivised to pursue opportunities.

11. Vector agrees with Castalia (3.1) that electricity markets are different than other more normal markets but our view is that this is primarily because electricity is produced and consumed at the same time and therefore has unique system operation requirements. Vector believes that the two points put forward by Castalia supporting the distinction between electricity and normal markets are not likely to sustain as the demand side expands:

- *"Customers cannot generally be physically prevented from taking as much power as they want;*
- *Many customers do not respond to rising wholesale prices by cutting back demand, because they do not in fact face the rising prices"⁵*

12. Vector believes there is potential for (particularly larger) customer contracts to be interruptible (able to be physically prevented from taking as much power as they want) and going forward that developments in smart metering technology and pricing could provide customers with an increasing ability to respond to pricing signals.

Calculating the optimal security of supply standard

⁵ "Electricity Security of Supply Policy Review – Consultation Paper for the Electricity Commission"
March 2007. Section 3 pg 25

13. As outlined above, Vector believes the present variable nature of energy sources is likely to be exacerbated as hydro and wind volatility is accommodated. Historically, New Zealand has dealt with hydrology-related security issues by defining a security standard (e.g. to meet demand in a 1-in-60 dry year), then building thermal firming capacity to meet that standard and, where necessary, resort to demand reduction campaigns to manage extremely tight periods.
14. Vector believes it is necessary to revisit the security standard (1-in-60 dry year) and potentially move away from a hydrology-based definition of security of supply to a broader probabilistic measure. Vector's view is that the hydrology-based definition is no longer appropriate in the New Zealand electricity market and a broader probabilistic measure would be more likely to encompass all dimensions of variability. Vector believes the appropriate probability (the implicit level of risk of exceedence of the demand forecast) should be determined by the industry in consultation with wider stakeholders.
15. Vector believes a conservative approach should be taken towards the inclusion of any assumed voluntary demand reduction in the analysis given its inherent variability and unpredictability.

Optimal security of supply policy

16. Currently, generators can invest in generation in order to meet demand the majority of time, with the EC responsible for procuring "just-in-time" reserve energy to meet any shortfall during dry years. There is a reduced incentive (or consequence) for generators failing to consider how demand is met in a dry year since this is presumed to be the domain of the EC. Vector sees this as a risky policy in light of a greater wind-based future. The EC will be responsible for procuring (with short lead times) reserve generation to cover dry, (relatively) windless years.
17. Vector believes that to ensure efficient, affordable security of supply, generators/retailers should be made responsible for delivering enough energy to meet demand. A capacity mechanism could require retailers/generators to hold sufficient generation or contracts with generators to meet contracted loads to a defined security standard. A number of electricity markets elsewhere employ a form of capacity margin instrument in order to secure a fixed level of capacity margin. If designed properly, a capacity mechanism could shift the responsibility for maintaining security of supply from the Electricity Commission

to the generators/retailers – who Vector believes are best placed to manage the risks and have a sufficient time-horizon to balance increases in renewable contributions with firm (likely thermal capacity).

Conclusions and closing comment

18. Vector sees security of New Zealand electricity supply as a very important issue and welcomes Castalia's "Electricity Security of Supply Policy Review". Vector's key concerns with the review are outlined below:

- Vector believes that the security of supply definition should cover security of supply across the energy supply chain to create a 'system' definition of security of supply;
- Vector believes that the appropriate security standard should be expressed as a percentage probability of ensuring security of supply (i.e. 95%);
- Vector believes that any reform of the reserve energy policy should place obligations on retailers to procure/demonstrate sufficient generation capacity and fuel stocks to meet an appropriately defined security standard.⁶

19. Thank you for considering this submission. We would be happy to clarify our views on any matter or provide further information if useful. Please contact myself or Rochelle Ladd (Regulatory Advisor), rochelle.ladd@vector.co.nz, 09 978 8284) if you would like to discuss any aspects of this submission in further detail.

Kind regards



⁶ The EC was provided with reports by CRA in 2005 on the potential for "capacity ticket" type obligations to be placed on retailers to ensure they build sufficient generation and have access to fuel stocks in dry years. Revisiting those reports and evaluating international experiences with retailer obligations would be a useful step in reviewing the current approach to reserve energy.

Nathan Strong

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