Security of Supply Policy

Explanatory Paper

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October 2008

Summary of revised security of supply policy

Key Policy Elements	Description
Approach to Security of Supply	• The Commission will focus on providing information and analysis as its primary mechanism for managing security of supply risks. • Reserve Energy and/or Reserve Capacity will be procured, as a last-resort measure, if security margins fall below prescribed levels. • Reserve Energy/Capacity will be dispatched if market prices rise higher than price triggers determined for each reserve contract. • Reserve Energy will also be dispatched if hydro storage drops below particular guidelines.
Forecasting long-term security	• The Commission will publish ten-year forecasts of supply and demand including an assessment of the Winter Energy Margin and the Winter Capacity Margin. • New generation investment decisions will be recorded and monitored.
Winter Energy and capacity Margins	• The Commission will assess the need for Reserve Energy and Reserve Capacity each year by calculating Winter Energy Margins and Winter Capacity Margins over several years.
Procuring Reserve Energy and capacity	• The Commission will procure Reserve Energy if the Winter Energy Margin is forecast to fall below 17% for New Zealand as a whole, or below 30% for the South Island, over the next 3 years. • The Commission will procure Reserve Capacity if the Winter Capacity Margin is forecast to fall below 780 MW over the next 2 years. • Procurement will balance the costs, benefits and risks of Reserve Energy/Capacity and focus on options which maximise overall welfare.
Monitoring Hydro Storage	• The Commission will monitor hydro storage against hydro risk curves that reflect the risk of electricity shortages taking into account the range of likely inflows. • The risk curves will include an Emergency Storage Guideline corresponding to a 10% risk of electricity shortages.
Dispatching Reserve Energy	• The Commission will develop and publish a dispatch policy for each Reserve option. • A hydro storage guideline will be published reflecting the point at which it expects each Reserve Energy option to be dispatched.
Managing Emergencies	• If storage falls below the Emergency Storage Guideline the Commission will initiate a series of emergency measures as set out in the Emergency Response Plan.
Managing Conflicts	• The Commission will manage any conflicts of interest by avoiding any direct operational role and publishing information on any Reserve Energy arrangements.

Glossary of abbreviations and terms

Capacity	The capability of generating plant to produce energy per unit of time (often expressed in megawatts)
Capacity adequacy	Having enough capacity to meet high levels of demand while allowing for generation plant outages
Capacity shortfall	A situation where available supply cannot meet demand plus reserves and frequency keeping.
Dispatch policy	A policy which determines the basis on which ***Reserve Energy*** will be offered into the wholesale electricity market
Emergency Response Plan	A plan developed and published by the Commission which sets out the particular emergency measures and the sequence they will be called upon, in the event that storage falls below the ***Emergency Storage Guideline***
Emergency Storage Guideline	The profile of New Zealand (or South Island) hydro storage over a calendar year which represents a 10% risk of future electricity shortages
Energy adequacy	Having enough generating plant and fuel to meet electricity demand over a defined time period
Hydro Risk Curve	A profile of New Zealand (or South Island) hydro storage over a calendar year which represents a certain risk of future electricity shortages (curves for 1%, 2%, 4%, 6% and 8% risk are proposed)
Load duration curve (LDC)	A distribution of annual half-hour demands sorted from highest to lowest.
Mean inflows	The average of hydro inflows across all available history for particular catchments for a particular time period
Reserve Demand	Electricity demand reductions procured to meet security of supply objectives
Reserve Energy	Energy procured to meet security of supply objectives
Reserve Generation	Electricity generation procured to meet security of supply objectives
Winter	The period 1 April to 30 September
Winter Capacity Margin	The MW difference between a measure of the expected capacity and the average of the highest 200 half-hours of demand from 1 April – 31 October between 7am and 10pm.
Winter Energy Margin	The difference between the expected amount of energy that can be supplied during the ***Winter*** and expected demand during the ***Winter***, expressed as a percentage of expected demand

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1. Introduction and purpose of this report

1.1 Introduction

1.1.1 The Electricity Act 1992 (Act) and the Government Policy Statement on Electricity Governance (GPS) establish a responsibility for the Electricity Commission to manage the security of supply of electricity.

1.1.2 The Government published a revised GPS in May 2008. The revised GPS acknowledges the review of the reserve energy policy undertaken by the Commission during 2007 and implements some changes to the Security of Supply Policy section. These changes follow the recommendations made by the Commission to the Minister in October 2007 following the review.

1.1.3 The Commission has undertaken further work following on from the Reserve Energy Review and from the changes to the GPS. This work has been the subject of a number of consultation papers on security of supply issues and security of supply standards during 2008[1]. These papers have covered both reserve energy and reserve capacity issues.

1.1.4 The Commission has recently reviewed its security of supply policy to reflect the changes to the GPS, taking into account the further work that has been undertaken, and addressing both reserve energy and reserve capacity issues.

1.2 Purpose of this report

1.2.1 The purpose of this paper is to:

- Describe the work that was undertaken to develop a standard for energy adequacy;
- Describe the work that was undertaken to develop a standard for capacity adequacy;
- Outline the Commission's consideration of other security of supply issues addressed by the GPS; and
- Outline the rationale for the revised security of supply policy.

1.2.2 The Commission is also publishing, at the same time as this paper, the annual assessment of security of supply. This assessment has been prepared on the basis of the revised security of supply policy attached as Appendix 1 and described in this explanatory paper.

[1] The consultation papers are listed in the reference section of this paper.

1.3 Submissions not required

1.3.1 The Commission has issued several consultation papers on security of supply and the development of energy adequacy and peak adequacy standards over the last 12 months. Stakeholders have had several opportunities to provide submissions in support of their views.

1.3.2 The Commission considers that it has a good understanding of stakeholder views and has taken these into account in reaching conclusions on the form of the revised security of supply policy.

1.3.3 Accordingly, the Commission is not seeking submissions on the revised policy. (However, if any stakeholders have particular views that they wish to make known to the Commission, they are welcome to provide those views, and they will be considered in due course.)

2. Background

2.1 Legal Framework – the Electricity Act

2.1.1 The Act and GPS in combination provide a responsibility for the Commission to manage the security of supply of electricity and provide some guidance about how the government expects the Commission to go about the task.

2.1.2 The functions of the Commission set out in the Act that relate to security of supply include the following:

Act reference	**Functions of the Commission relating to security of supply**
172O(1)(d)	To use reasonable endeavours to ensure security of supply (including contracting for reserve energy), without assuming any reduction in demand from emergency conservation campaigns, while minimising distortions to the normal operation of the market.
172O(1)(j)	To give effect to the GPS objectives and outcomes (*including those relating to security of supply*).
172O(1)(g)	To manage emergency conservation campaigns to avoid material risk of supply shortages.
172O(1)(a)	To formulate and make recommendations concerning electricity governance regulations and rules (*to give effect to the principal objectives and specific outcomes as they relate to security of supply*).

2.1.3 The Act also sets out the principal objectives of the Commission and specific outcomes that the Commission must seek to achieve. The specific outcomes include:

Act reference	**Specific Outcomes the Commission must seek to achieve**
172N(2)(b)	Risks (including price risks) relating to security of supply are properly and efficiently managed.

2.1.4 The functions and specific outcomes set out in the Act prescribe the Commission's legal obligations, define the Commission's powers to intervene in the market, and provide a framework within which security of supply policy and the revised GPS must be considered. The role of the GPS is to guide the Commission in terms of government expectations about how the Commission is expected to go about meeting its functions and delivering the specific outcomes under the Act.

2.2 The GPS – a Guide to Government Expectations

2.2.1 The GPS provisions cover a wide range of issues relating to security of supply and provide a high degree of guidance about how the Commission must go about implementing the reserve energy policy.

2.2.2 Paragraph 41 of the October 2004 GPS included a requirement for the Commission to publish a security of supply policy covering a range of operational detail. Accordingly, the Commission published a policy document in June 2005.

2.3 Initial Security of Supply Policy 2005

2.3.1 The initial security of supply policy was published in June 2005 and has been in place, guiding the Commission's activities in the area of security of supply, since that time. It is summarised briefly in the following table:

Section	Description
Security of Supply Objective	Expected supply under a 60 year return period drought will be sufficient to meet expected demand without the need for emergency intervention.
Approach	Approach is to focus on providing information on security of supply risks, monitoring security in the long-term, medium-term and short-term, and triggering the purchase and use of Reserve Energy as necessary.
Minzone	Minzone is calculated according to the hydro storage required to sustain 1:60 year low inflow sequence with all non-hydro supply committed.
Need for Reserve Energy	Purchase of Reserve Energy is triggered if the top of the Minzone in any of the next two years exceeds a particular storage level (currently assessed as about 70%). The trigger storage level is determined by the trade-off between the cost of Reserve Energy and the cost of spill.
Dispatching Reserve Energy	Whirinaki is offered for supply at the higher of $200 per MWh or the variable cost. If storage falls below the Minzone and Whirinaki is not dispatched, the Commission will investigate the reasons why. A dispatch policy will be developed for each new Reserve Energy option depending upon the characteristics of the option – essentially involving a security guideline derived to reflect the variable cost.
Emergency Zone	Emergency measures will be triggered when storage falls below a level assessed as 10% risk of shortage.
Monitoring	Energy Security Assessments will be published in three timeframes – up to 6 months, up to 2 years, and up to 10 years.

2.3.2 Since the policy was adopted in June 2005 the Commission has been following it closely by monitoring security of supply in the short-term using the Minzone, undertaking regular assessments of the need for additional reserve energy, and dispatching the Whirinaki reserve power station according to the policy.

2.3.3 The Commission is confident that the implementation of the reserve energy policy has been in accordance with the provisions of the Act and the GPS, and that the Commission has been meeting its reasonable endeavours commitment to ensure security of supply.

2.4 The Reserve Energy Review

2.4.1 Paragraph 65 of the October 2006 GPS required the Commission to engage an independent party to review the reserve energy regime and the security of supply policy. The Commission appointed Castalia Strategic Consultants in November 2006 to undertake the review. Castalia released an Issues paper and a Consultation paper, held a public hearing, and made its final recommendations to the Commission in May 2007[2].

2.4.2 The Commission undertook further detailed modelling and evaluation work, consulted further with stakeholders, and made final recommendations to the Minister in November 2007[3].

2.5 Recommendations to Minister on Reserve Energy Regime

2.5.1 The Commission made the following recommendations to the Minister in November 2007:

(a) **Security of Supply Policy** – The fundamental elements of the policy should be retained and the Commission should continue to monitor the security of supply situation and, if needed, procure and dispatch reserve energy to ensure the security of supply standard is met;

(b) **Security Standard** – The "1-in-60 dry year" standard should be replaced by a "winter energy margin" of 17 percent for New Zealand (and 30 percent for the South Island). If forward projections lead the Commission to conclude that the "winter energy margin" will fall below the standard it should trigger the purchase of additional reserve energy;

(c) **Short-Term Security of Supply Monitoring** – The concept of a "Minzone" to monitor security of supply risks should be developed into a series of

[2] A link to the Castalia Report is included in the references section of this paper.

[3] A link to the recommendations to the Minister is included in the references section of this paper.

hydro storage guidelines reflecting different levels of security of supply risk. The series of guidelines should help to reduce popular perceptions that shortages are imminent if hydro storage levels approach the traditional "1-in-60" Minzone;

(d) **Long-Term Security of Supply Monitoring** – The Commission should closely monitor new generation build and forecast security of supply outcomes over a five year timeframe in order to establish whether there is any potential for a systematic failure to provide adequate new capacity;

(e) **Dispatch of Reserve Energy** – The current arrangements for dispatch of reserve energy (currently only applying to the Whirinaki reserve station) should be retained pending the current review of the energy-only design of the wholesale electricity market;

(f) **Reserve Energy Levy** – The current levy arrangements should be retained because there are no alternative arrangements that would produce a fairer or more efficient outcome;

(g) **Information on Security of Supply** – The Commission should undertake further work to improve market participant and public understanding of the security of supply policy

(h) **Unexpected Supply Contingencies** – The Commission should further investigate short-term reserve energy options to cover possible unexpected security of supply contingencies. These options should include the possibility of re-locatable containerised diesel-fired generators; and

(i) **Amendments to the GPS** – The GPS should be amended to focus on a security standard expressed in energy margin terms, generally remove operational detail, and incorporate the Commission's recommendations.

2.5.2 The recommendation to the Minister also noted that the review of reserve energy policy had focussed on a security standard for energy adequacy and that New Zealand was likely to move over time from an "energy constrained" system to one that is "peak constrained", leading to a need to monitor capacity adequacy as well as energy adequacy.

2.5.3 Accordingly, the Commission indicated that it had commenced work to investigate a standard for capacity adequacy, and expected to reach some conclusions by August 2008.

2.6 The May 2008 GPS

2.6.1 The revised GPS issued by Government in May 2008 is generally consistent with the recommendations made by the Commission in November 2007. In accordance with the Commission's recommendations, the overall approach to

security of supply remains the same, and the key functions of the Commission are retained.

2.6.2 The main differences from the previous GPS include:

(a) Replacing the “1-in-60” security standard with a requirement to maintain a “Winter Energy Margin” of 17% (30% for the South Island);

(b) Including a requirement for the Commission to develop and set standards for adequacy to meet peak demand;

(c) Monitoring whether the market is consistently failing to deliver new capacity and making recommendations to the Minister for alternative arrangements if that is the case;

(d) Removing the reference to a traditional “minzone” hydro storage profile and replacing it with a set of “hydro storage guidelines” reflecting different levels of security risk;

(e) Triggering the procurement of reserve energy if the Commission forecasts that the “Winter Energy Margin” will fall below 17% (or 30% for the South Island);

(f) Removing the requirement to include water heating cuts as an emergency measure; and

(g) Requiring the Commission to review the security of supply arrangements (both the GPS requirements and Commission policy) by the end of 2012.

2.6.3 The Commission has revised the security of supply policy in accordance with the recommendations made to the Minister in November 2007 and to meet the requirements of the revised GPS.

2.6.4 The balance of this paper describes the key changes to the security of supply policy.

3. Energy Adequacy

3.1 Introduction

3.1.1 The key recommendation included in the Castalia Report was that the security of supply standard should be changed from ensuring no demand restraints (either voluntary or forced rationing) were required in a 1-in-60 dry year, to ensuring that the energy margin did not decline below a simple percentage annual energy margin.

3.1.2 Castalia preferred the energy margin approach over the previous approach because it related directly to the economic cost of the expected level of demand restraint, was simpler and easier to understand, and provided a more direct and obvious trigger for the procurement of reserve energy.

3.1.3 The Commission (and many submitters) agreed with this recommendation and the Commission therefore undertook the further work that Castalia suggested was necessary to determine a simple and robust energy margin. The results of this further work were outlined in detail in a consultation paper released in September 2007 and as an attachment to the recommendation to the Minister in November 2007 (see reference section for links to these documents).

3.2 Determining the energy margin

3.2.1 The Castalia Report pointed out that we all know that absolute security of supply is not a sensible objective because of the massive redundancy in plant and fuel supplies that would be needed. The report also pointed out that, from an economic perspective, the optimal security of supply is that which minimises the total combined cost of “demand restraint” and security of supply mechanisms.

3.2.2 The Castalia approach involved:

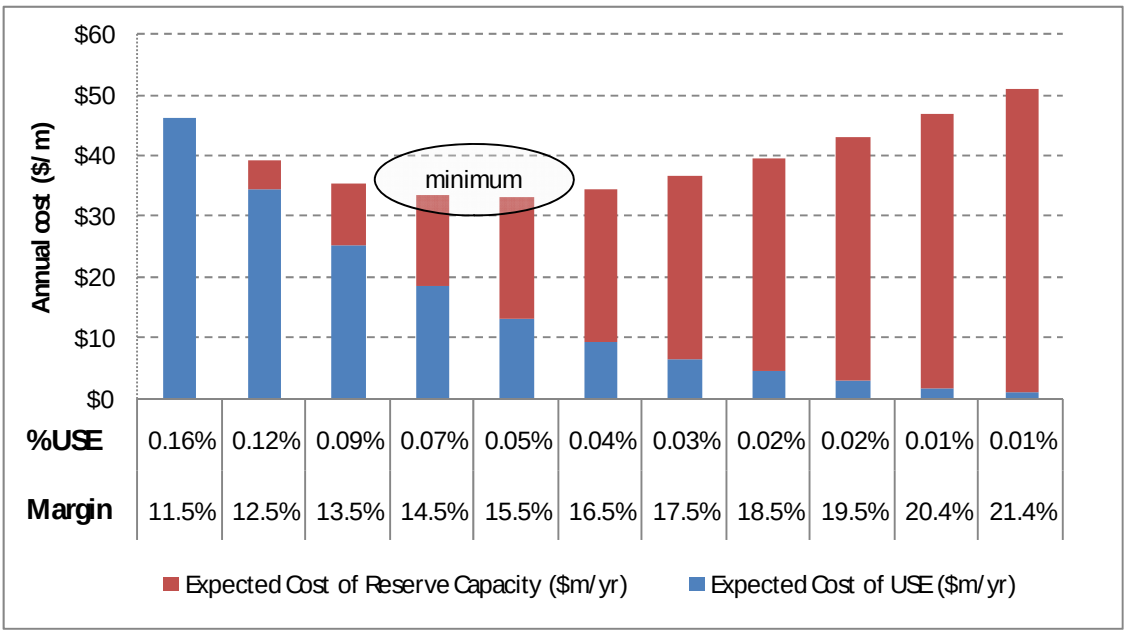
(a) Detailed analysis of the possibility of shortages by focussing on the residual demand for thermal generation over the critical winter period while accounting for variations in hydro supply, electricity demand, and other non-hydro generation; and

(b) Determining the optimum standard by calculating the energy margin which minimises the total combined cost of energy shortages and reserve generation.

3.2.3 This approach can most readily be considered using the illustration in Figure 1. This illustrates a stylised trade-off between increasing levels of reserve capacity and reducing levels of un-served energy (USE). By varying the level of reserve

capacity and observing the cost of electricity shortages it is possible to determine an optimal level of security of supply at the point where total costs are minimised.

Figure 1: Illustrative determination of optimum reserve margin



3.2.4 Castalia recommended that the Commission undertake some detailed modelling and analysis in order to establish a robust estimate of the optimum energy margin by trading off the costs of electricity shortages against the cost of supplying reserve capacity using this technique.

3.3 Results of analysis

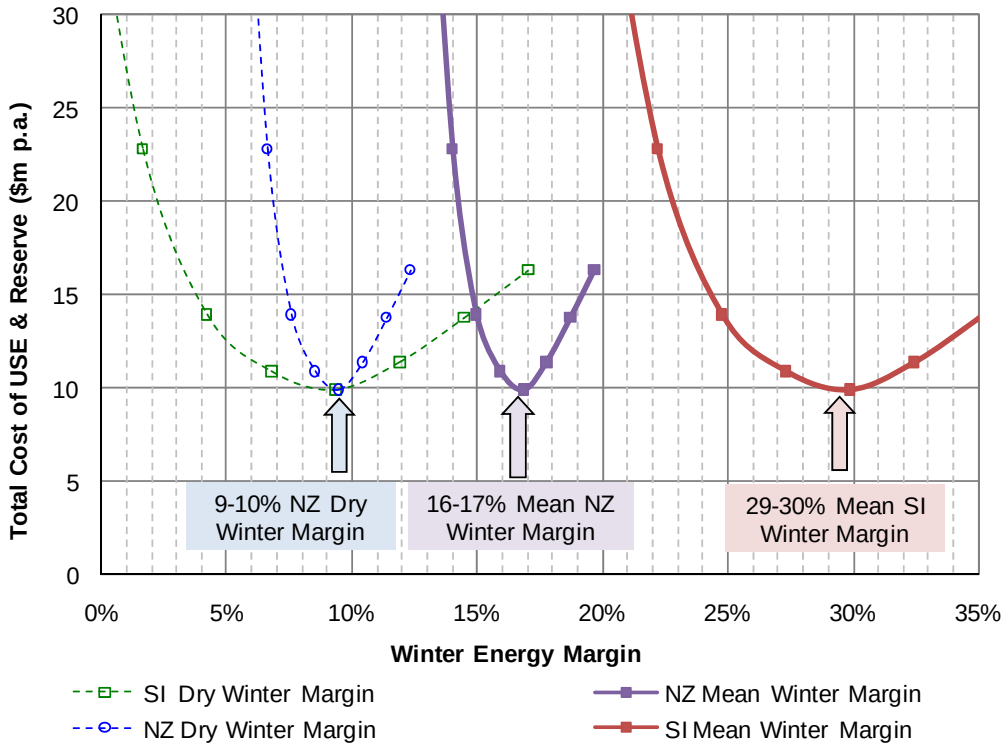
3.3.1 The Commission undertook detailed modelling and analysis to simulate supply and demand uncertainties, to estimate the cost to society of varying levels of electricity shortages, and explored the economic trade-off. The detailed analysis and results are reported in the September consultation paper and the recommendation to the Minister.

3.3.2 Transmission constraints between the North and South Islands dictate that it is necessary to explore security in the South Island as well as for New Zealand as a whole. Figure 2 summarises the results of the analysis for both the South Island and New Zealand as a whole. Results are expressed in both “mean winter” and “dry winter” terms.

3.3.3 Because most of the hydro variability occurs in the South Island and the South Island demand is much smaller than New Zealand as a whole, the optimal mean winter margin, when expressed in percentage terms, is much higher (29% to

30%) than for New Zealand. Expressed as a dry winter margin the percentages are almost equal at around 9%.

Figure 2: Optimal Dry and Mean Year Energy Margins



3.3.4 The Commission has chosen to use the "mean winter" energy margin rather than the "dry winter" energy margin. This is because the two approaches are essentially a different expression of exactly the same standard and choosing a definition for a "dry winter" is a relatively arbitrary exercise.

3.3.5 The sensitivity of the results were tested against a range of factors including variations in the cost of electricity shortages, the cost of reserve generation, and the availability of interisland HVDC transmission capacity. This suggested that the results were most sensitive to the cost of reserve generation and the cost of electricity shortages.

3.3.6 After reviewing the analysis and considering submissions from stakeholders, the Commission recommended setting the standard at 17% Mean NZ Winter Energy margin and 30% Mean SI Winter Energy Margin and this has been reflected in the revised GPS.

3.4 Comparison with existing policy

3.4.1 The previous policy for triggering the purchase of reserve energy involved forecasting the "minzone" over several years, making assumptions about the availability of existing generation, new generation developments, and the level of demand. If the top of the "minzone" exceeded a trigger storage level of 70%, the Commission would consider purchasing reserve energy.

3.4.2 In practice, the top of the "minzone" was always well below 70% of the storage level and it had not been necessary to consider purchasing further reserve energy. The Commission had also identified that further work would be necessary to determine with confidence the most appropriate level for the trigger.

3.4.3 The analysis undertaken by the Commission suggests that the proposed New Zealand "winter energy margin" of 17 percent will continue to provide a similar level of security as the existing "1-in-60 dry year" standard. However, the Commission considers that it is easier to calculate, easier to understand, easier to communicate, and will provide a clearer trigger for the purchase of reserve energy.

4. Capacity Adequacy

4.1 Introduction

4.1.1 Section 2 of this paper identified that the Commission saw the need to develop a standard for capacity adequacy to complement the energy adequacy standard, and that this had been reflected in the GPS requirements.

4.1.2 The Review of Reserve Energy Policy undertaken by the Commission during 2007 focussed on a security standard for energy capacity adequacy. The recommended "energy margin" that emerged from the review represents an ability to supply electricity over time, while allowing for dry periods.

4.1.3 Many international security of supply standards focus on peak capacity adequacy in order to assess the ability to supply peak electricity demand at any point in time. They focus on peak capacity adequacy because they are "peak-constrained" rather than "energy-constrained" – in other words they need to construct new supply in order to meet peak demands rather than supply energy over time.

4.1.4 Historically, New Zealand has not had a peak capacity problem because of the high proportion of hydro capacity with associated flexible fuel supply (storage). We have tended to construct new power station capacity in order to supply energy over time rather than to meet peak demand – in other words New Zealand has been considered as "energy-constrained"

4.1.5 In recent times, the retirement of New Plymouth power station, the growth in peak demand, and the addition of intermittent generation in the form of wind farms, has eroded the margin between capacity and demand at peak times. This has led to suggestions that a capacity adequacy standard may be necessary to complement the energy adequacy standard.

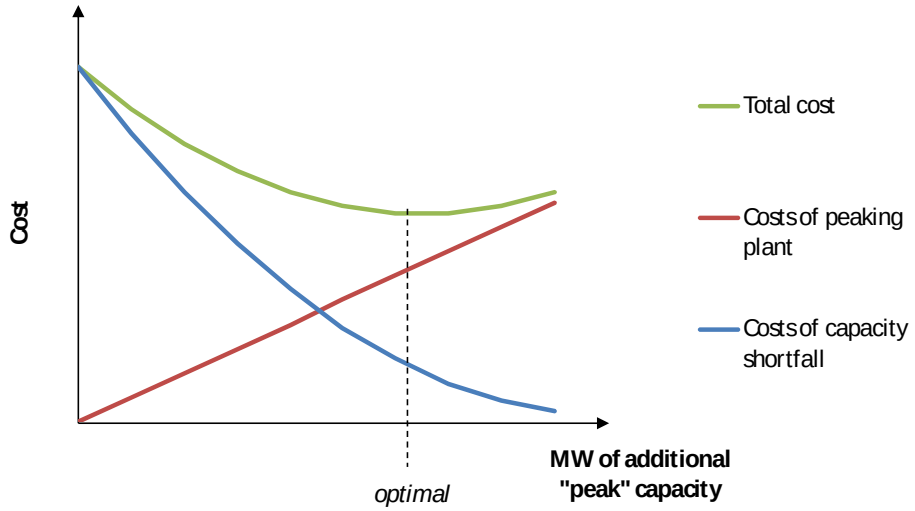
4.1.6 The Commission has therefore undertaken detailed modelling and analysis in order to establish a standard for capacity adequacy and this has been reported in a June 2008 consultation paper (see link to document in reference section). Further work was undertaken as a result of the issues raised in submissions and a further paper summarising this additional work is included on the Commission's website (see link in reference section).

4.2 Determining the capacity margin

4.2.1 The approach to developing an optimal capacity adequacy standard follows a similar approach to that used to develop an optimal energy standard. From an economic perspective, the optimal level of capacity adequacy is derived by

trading off the cost of peak capacity against the cost of demand restraint and outages at peak times, or at times when capacity is low relative to demand. This is illustrated in Figure 3.

Figure 3: Illustration of cost trade-off



4.2.2 Capacity adequacy standards can be defined in a variety of ways, but typically are defined as either a MW capacity margin, a level of expected un-served energy (EUSE) or a loss of load expectations (LOLE) or loss of load probability (LOLP).

4.2.3 This papers referenced in 4.1.6 describe the application of the economic approach, trading off the costs of capacity shortfalls against the costs of adding reserve capacity. Techniques for performing this assessment differ principally in the handling of inter-temporal linkages and the degree of detail around the causes and consequences of capacity shortfalls. An LDC convolution approach[4] has been applied which captures the interaction between supply and demand on a probabilistic basis.

4.2.4 The approach involves simulating multiple supply and demand scenarios, reflecting the uncertainties in each, and using Monte Carlo simulation techniques to derive probability distributions of possible capacity shortfalls. The optimum level of capacity is explored by adding capacity and calculating the combined total cost of capacity and capacity shortfalls.

[4] This refers to a modelling technique using a load duration curve (LDC) to simulate the variability of electricity demand and is described in detail in the capicity adequacy papers.

4.3 Results of analysis

4.3.1 The results indicate that a North Island margin expressed in MW terms is a potentially stable measure of capacity adequacy for the period through to 2012 (at least). The analysis focussed on North Island adequacy, though explicitly accounted for the interaction of South Island supply, demand and northward transmission (HVDC) capability. The MW margins have been calculated as the difference between expected winter supply and a measure of expected winter demand.

4.3.2 Because approximately half of North Island demand is supplied by large thermal units (250 MW or more) , the system is susceptible to capacity shortfalls at all times of high demand rather than just at times of “peak” demand. To this end, the reference demand has been defined as the average of the highest 200 half-hours of forecast winter daytime demand.

4.3.3 The results identified an optimum North Island Winter Margin of 780MW. Sensitivity analysis suggests a plausible variation of +/- 70 MW to cover variation in costs of capacity shortfalls, costs of reserve capacity, and peak availability.

4.3.4 The 780MW margin is also broadly consistent with the heuristic standard developed by the National Winter Group in their assessment of peak adequacy for winter 2008, although it is defined differently.

4.4 Comparison with international standards

4.4.1 Many deregulated electricity markets have some form of capacity adequacy standard (note that the equivalent is often referred to as a “reliability standard”). However, care is required when comparing international standards with that which might apply in New Zealand, because supply mix, market design and regulator requirements differ markedly.

4.4.2 Research of international standards in comparable electricity markets suggests that:

(a) The primary standard used in Australia is based on quantities of expected un-served energy (EUSE) of up to .002% of annual demand;

(b) The standards used in Ireland, France, the United Kingdom, Ontario and the PJM market, are all based on a loss-of-load expectation (LOLE) ranging from 2.4 to 8 hours per annum.

4.4.3 The 780 MW Winter Capacity Margin preferred by the Commission for New Zealand can be demonstrated to be equivalent to .0022% (EUSE) and 2.7 hours per annum (LOLE). Therefore the standard derived for New Zealand is very close to those applied in other comparable electricity markets.

4.4.4 The Commission prefers to express the standard as a Winter Capacity Margin (rather than in EUSE or LOLE terms) because it is more readily understood, relates to practical situations and is more readily calculated than either EUSE or LOLE.

5. Security of supply policy

5.1 Key changes to policy

5.1.1 The key changes to the security of supply policy reflect the changes to the GPS as set out in section 2.6.2 including:

(a) Establishing a requirement to maintain a "Winter Energy Margin" of 17% (30% for the South Island) as described in section 3;

(b) Including a requirement to maintain a "Winter Capacity Margin" of 780 MW as described in section 4;

(c) Monitoring whether the market is consistently failing to deliver new capacity and making recommendations to the Minister for alternative arrangements if that is the case; and

(d) Introducing a set of "hydro risk curves" reflecting different levels of security risk.

5.1.2 The "hydro risk curves" reflecting different levels of security risk have been under development and the Commission expects to publish a set of these curves and reserve energy dispatch guidelines, of the form indicated in the revised policy, before the end of November 2008.

5.2 Summary of the revised policy

5.2.1 The revised security of supply policy has been published on the Electricity Commission website (with a link provided in the reference section of this paper). The key elements of the policy are summarised in Table 1.

Table 1 Revised security of supply policy

Key Policy Element	Description
Approach to Security of Supply	• The Commission will focus on providing information and analysis as its primary mechanism for managing security of supply risks. • Reserve Energy and/or Reserve Capacity will be procured, as a last-resort measure, if security margins fall below prescribed levels. • Reserve Energy/Capacity will be dispatched if market prices rise higher than price triggers determined for each reserve contract. • Reserve Energy will also be dispatched if hydro storage drops below particular guidelines.

Key Policy Element	Description
Forecasting long-term security	• The Commission will publish ten-year forecasts of supply and demand including an assessment of the Winter Energy Margin and the Winter Capacity Margin. • New generation investment decisions will be recorded and monitored.
Winter Energy and capacity Margins	• The Commission will assess the need for Reserve Energy and Reserve Capacity each year by calculating Winter Energy Margins and Winter Capacity Margins over several years.
Procuring Reserve Energy and capacity	• The Commission will procure Reserve Energy if the Winter Energy Margin is forecast to fall below 17% for New Zealand as a whole, or below 30% for the South Island, over the next 3 years. • The Commission will procure Reserve Capacity if the Winter Capacity Margin is forecast to fall below 780 MW over the next 2 years. • Procurement will balance the costs, benefits and risks of Reserve Energy/Capacity and focus on options which maximise overall welfare.
Monitoring Hydro Storage	• The Commission will monitor hydro storage against hydro risk curves that reflect the risk of electricity shortages taking into account the range of likely inflows. • The risk curves will include an Emergency Storage Guideline corresponding to a 10% risk of electricity shortages.
Dispatching Reserve Energy	• The Commission will develop and publish a dispatch policy for each Reserve option. • A hydro storage guideline will be published reflecting the point at which it expects each Reserve Energy option to be dispatched.
Managing Emergencies	• If storage falls below the Emergency Storage Guideline the Commission will initiate a series of emergency measures as set out in the Emergency Response Plan.
Managing Conflicts	• The Commission will manage any conflicts of interest by avoiding any direct operational role and publishing information on any Reserve Energy arrangements.

References

<Link to Castalia Report on Reserve Energy Review, May 2007>

<Link to consultation paper Review of Reserve Energy Policy; October 2007>

<Link to EC recommendation to the Minister, November 2007>

<Link to consultation paper Development of a Capacity Adequacy Standard; May 2008>

<Link to Revised Security of Supply Policy; October 2008>

<Link to report Development of a Capacity Adequacy Standard; October 2008>