

Lower South Island Electricity Load Forecast

17th December 2008

Introduction

This report builds on a previous study conducted by Covec in July 2008 entitled “Southland Region Electricity Load Forecast”. The purpose of the July report was to estimate mean, prudent and 5% probability of exceedence forecasts which was done by estimating load growth rates for each grid exit point (GXP). There were higher short term growth rates to account for the strong recent load growth which over the long term tended to a lower base growth rate.

The purpose of this report is to provide a prudent and expected peak load forecast by estimating the step load changes and organic growth for the next ten years for the summer and winter period. The summer period is defined as between 20th October and 9th May and is recorded in the year in which it ends. Step load changes have been estimated by talking with some of the attendees of the Lower South Island Stakeholder Forum that took place on October 10th 2008. These companies include; Alliance Group, Dongwha Pattina, Environment Southland, Fonterra, L & M Group, Rio Tinto, Silver Fern Farms and Venture Southland.

For the purposes of this report, the lower South Island contains the following GXPs:
Balclutha (BAL), Brydone (BDE), Clyde (CYD), Cromwell (CML), Edendale (EDN), Frankton (FKN), Gore (GOR), Halfway Bush (HWB), Invercargill (INV), Naseby (NSY), North Makarewa (NMA), Palmerston (PAL), South Dunedin (SDN) and Tiwai (TWI).

Consultation with Stakeholders

Upon consultation with the various lower South Island stakeholders, we believe there are a few key industries that will have a significant impact on electricity load in the region. These industries are dairy farming and milk processing, meat processing, timber processing, oil and gas exploration, coal (lignite) and the aluminium smelter. We look at each industry in detail.

Dairy Industry

The dairy industry in the lower South Island, especially Southland has experienced considerably growth recently. There is a high rate of dairy conversions with Venture Southland reporting over 100 conversions just in the Southland Region in 2008 with a similar number expected in 2009. Each dairy conversion adds 50-55kVA to load, although efficiency gains would be expected.

Fonterra estimate that the milk supply will increase by 5.5 - 8.5% annually from 2009-2014 in the lower South Island. Based on this growth rate, the number of dairy conversions are expected to be between 50-90 per annum. By 2011 the milk processing capacity of the region is expected to be reached. Additional capacity will be required

which can be provided at the existing Fonterra facility at Edendale or at new location (likely to be either connected to the Gore or North Makarewa GXPs).

The processing plant is estimated to have a peak load of 7MW and will take about a year from construction to operation. If the plant is at Fonterra's premise it is likely to only produce an additional 4MW to peak load. If this growth in the dairy industry continues, it is likely at another processing plant will be needed in about 4-5 years time.

From our discussions, we have established there are potentially 2 step load changes in the dairy industry in the lower South Island, both being addition milk processing plants. As the milk processing is a competitive industry in the region, it is difficult to determine the location of the new processing plants.

Mataura Valley Milk's air and storm water consents were approved this month which means a milk processing factory is one step closer at the McNab site in Gore. We have assumed this plant is likely to go ahead which will result in step load change at the Gore GXP. The 7MW load is spread over a few years from construction to full operation.

A second additional processing plant is a possibility for the region. This will depend on the rate of dairy conversions and the growth of the milk supply. We have assumed an additional plant may be located at the Fonterra facilities in Edendale under our prudent forecast in 2015-2016.

The reason the second additional plant is only under our prudent forecast is because there is relatively little information on the medium and long term outlook for this industry. We expect the recent trends to slow slightly in the short term due to the current global economic conditions making it harder for farmers to borrow funds for dairy conversion. There also are constraints on the availability of water for irrigation and security of electricity supply issues.

Dairy conversions are shown as dairy growth in our forecasts for the Edendale, Gore, Invercargill and North Makarewa GXP's. Our expected forecasts assume this growth will remain until 2013-2014 whereas our prudent forecasts use a higher growth rate over the entire time period.

Meat Processing

As a consequence of the recent high growth in the dairy industry, there has been a reduction in meat production. In the upcoming season, Alliance Group are expecting a reduction in lamb production of 10% and mutton kill of 25% with beef production remaining constant. Approximately 90% of Alliance's meat production is from lamb. It is likely that there will be a shortening of the season as a result. It is likely that Alliance may need to close some plant in the Southland Region.

Silver Fern Farms have also felt similar effects. The Burnside venison plant closed down earlier this year and the Silverstream refrigeration plant is currently beginning sold to Polarcold.

With additional dairy cows beef processing may also increase especially in the dry summers. With a dry summer there is little grass growth so farmers need to have some their stock killed to protect the grass for subsequent seasons.

Our forecasts assume that the some of the processing plant at Maitua will be closed which will halve the peak load from 6.5MW to 3.25MW in the summer of 2010/11. The closure of the Burnside plant (load 1.4MW) wouldn't have been seen in the current years load so has been deducted from the start of next years.

Timber Processing

Dongwha Pattina specialise in producing Medium Density Fibreboard (MDF). They are not anticipating any load changes in the foreseeable future. The current economic situation may result in a decrease in demand for their product but it's unlikely to cause any change in peak load. The plants still operate at full capacity when the demand is there. There may be a decrease in energy consumption but not peak load.

Oil and Gas Exploration

Exploration licenses were issued in the middle of last year for oil, gas and minerals in the great southern basin. The area is over 500,000 sq km making it one of New Zealand's largest petroleum basins. Recent exploration may show it has the thick sediments to produce the necessary hydrocarbons. Two major investors ExxonMobil and OMV are currently conducting seismic tests to confirm the stability of the area to ensure it is not affected by large scale seismic faults that are found in most of New Zealand's basins.

The initial exploration is expected to take between 1-5 years, with offshore exploration and drilling in 2-10 years and development and production in 10-25 years.

There a number of variables that will determine whether it reaches the development stage. Discovery of oil and gas, large enough fields, ease of access to the field, current oil prices, security of electricity supply and emissions trading among many others. Currently we are at the initial stages of exploration with only \$1.2m committed. The possibility of potential LNG plant at this time is purely speculative.

We haven't included the LNG plant in our forecasts due to its speculative nature and if it goes ahead, its development is likely to be after the period of study in this report.

Coal/Lignite

The Southland Region has 75% of New Zealand recoverable lignite reserves. Most of these deposits are located in the Maitua and Waituna Ashers area. Two companies, Solid Energy and L+M Lignite, are currently in phase 2 of the feasible study. L+M Lignite expect to complete their feasibility study in three years time and if the conditions support it they hope to begin planning and construction straight away. Production in the lignite to liquids process is expected to begin after 3.5 years from the start of construction. It is likely that only one plant will be developed in the region. L+M

Lignite plan to be self-sufficient in their energy consumption with on-site generation of 690MW. A grid connect is also likely to supplement L+M Lignite's additional power needs or to inject electricity into the grid depending on commercial and/or political reasons. We were unable to obtain details of Solid Energy's plans.

As these projects are in the early stages of their feasibility studies they are very much speculative. The lignite to liquids plant proposed by L+M Lignite has on site generation to match its consumption. If Solid Energy's proposal is similar in its energy policy, there will be no increase to peak demand regardless of what project goes head. We have not included lignite mining and processing in our load forecasts for these reasons.

Solid Energy has contacted Transpower with plans for a pilot plant which converts coal to brickettes which will have a load of 1.2MW from 2010. If successful, a full commercial operation will be undertaken in 2012 which add between 15-20MW. This will be connected to the Gore GXP. We have been unable to confirm this with Solid Energy. Our expected forecasts include 1.2MW for the pilot plant in 2010 and our prudent forecast also includes 5.8MW in 2011 and 10.5MW in 2012 to give a total load of 17.5MW.

Other Minerals

Southland contains a large amount of silicon reserves estimated to be in the order of a billion tonnes of 98% pure silicon oxide. Three international companies have shown some serious interest but no significant investment. The processing plant is estimated to require 100MW which may come from the national grid or embedded generation from local coal. The initial timeframe for construction to begin is 2013 with production starting in 2016. We have not included this potential load in the forecasts due to its speculative nature. A silicon smelter requires security of electricity supply and with the uncertainty in this in the Southland Region it may prove to be too bigger risk to the potential investors.

There are many other overseas companies in various industries such as coal, steel, chemicals and oil and gas that have shown interest in setting up business in the lower South Island but the vast majority are frightened off by the security of supply issues that face the region. They feel that it is too risky with the uncertainty of supply especially in the dry years.

Aluminium Smelter

The aluminium smelter at Tiwai Point operates under the Tiwai Point Connection Contract (TPCC). Under this agreement, New Zealand Aluminium Smelters operates at a maximum of 610MW until the end of 2012 (expiry of TPCC). This constrains the smelter as it can utilise 620MW at full cell capacity. By replacing transformers the smelter can potentially use 640MW. NZAS hopes to increase load to 620MW by Jan 2009 and 640MW by Jan 2011. In the long term (5 years +) NZAS is looking to increase production to 700MW which would require significant capital investment (\$200million) as well as long term electricity price contracts and sufficiently high metal prices.

In May this year NZAS reduced their load by 5% due to the dry summer and the below average lake levels. In June they dropped their load by a further 5% to give a peak load of approximately 540-550MW until October. During October, NZAS began to ramp up their operations but during the first week of November a transformer was lost resulting in the current peak load of approximately 420MW. The transformer is due to be repaired within 6 weeks and will take at least 3-4 months (possibly twice as long) to get back to full operations. Another transformer is on order with potentially another one being ordered shortly. This investment would be sufficient for the smelter to reach 640MW.

According to the minutes of the Lower South Island Stakeholder Conference, NZAS is facing problems explaining the security issues due to the New Zealand market operation and the plant's remoteness from generation (security of supply) to its owners. The emission trading scheme will also have a large impact on the long term viability of the smelter. Together with the current transformer problems, there is some uncertainty and risk in the companies continued operations.

Our expected and prudent forecasts assume the 2009 summer peak will ramp up 25% and 50% respectively of the way to 619.4MW. It is forecast to reach the 620MW limit in winter 2009 and the 640MW in the summer of 2011 and 2012 for the prudent and expected forecasts respectively.

Lower South Island Load Forecasts

The expected and prudent forecasts are comprised of the step load changes outlined in the previous section and organic growth rates. The organic growth rates used in our forecasts are based on the growth rates in our previous report, "Southland Region Electricity Load Forecast" and have been updated to include additional information for stakeholders on dairy growth, building and construction developments, economic and employment growth and population change.

The step loads mentioned in the previous section are included in Table 2 in the appendix.

There is a significant amount of embedded generation, approximately 150MW, in the lower South Island. The majority of generation is in the North Makarewa GXP area (65.5MW), Halfway Bush GXP area (44MW) and the Naseby GXP area (15MW). Embedded generation reduces the load on the national grid but doesn't add much to the security of supply. If, for some reason, the embedded generation cannot be produced, the electricity demand will have to be supplied from the national grid.

Transpower provided us with embedded generation data from White Hill (58MW near the North Makarewa GXP) and Waipori (Halfway Bush GXP) over the last couple years. At North Makarewa the combined GXP plus embedded generation peak load (at the 99.9% percentile) was approximately 18MW and 7MW higher than the peak GXP load in summer and winter 2008 respectively. For Halfway Bush the combined GXP plus embedded generation peak load (at the 99.9% percentile) was approximately 10MW and

3MW higher for summer and winter 2008 respectively. For 2007 the values were about 14MW and 13MW. Our prudent forecasts have allowed for embedded generation to fall to zero at peak times. This is done by adding 20MW and 10MW (slightly above the 18MW and 7MW suggested earlier as there is also 7.5MW of embedded generation at Monowai) to give the prudent summer and winter forecasts respectively for North Makarewa. 14MW are added to produce the prudent summer and winter forecasts for Halfway Bush. For embedded generation at near other GXP's with the exception of Clyde and Naseby, we have assumed that the embedded generation is operating at peak times so the full embedded load is included in the prudent forecast. For the Clyde GXP, which has historically had a significant amount of variation in GXP load due to the timing of the use of embedded generation, we have assumed 3.3MW is operating at peak times which is less than a third of the 11MW embedded generation. In 2008 there was very little embedded generation produced at Naseby as it was a dry year. There was only a small increase in load at the Naseby GXP which can be attributable to base load growth. As a result we can conclude that there is little embedded generation at Naseby produced at peak loads, therefore we have assumed that less than 4MW (a quarter of available generation) will be operational at peak times. We have assumed embedded generation will remain constant at the current levels.

The prudent forecasts also include a buffer level in case of increases in load due to unpredictable events such as weather. The weather has a large impact on GXP load, dry years result in increased irrigation usage and cold snaps cause an increase in heating. We have used the variation over the last 10 years to estimate an appropriate level for the buffer for each GXP.

Within the region there is large amount of temporary load transfers between GXP's due to load management, maintenance, capacity restraints and pricing. Forecasting these load transfers is beyond the scope of this report however it is assumed the summer peaking GXP's of Edendale, Gore and North Makarewa may some load transfer during the winter period. Under the winter expected and prudent forecasts, we have assumed a temporary increase of 2% due to load transfers. No assumptions are made about load reductions due to transferring at any GXP's.

There have been some adjustments to the base value for which the forecasts are made. If historical data suggest a similar load between summer and winter, the base value for summer and winter has been equated to give equivalent forecasts for summer and winter. A sample of a load forecast is shown as Table 3 in the appendix.

The summer and winter, expected and prudent forecasts are shown in Table 3: **Edendale Prudent GXP Load Forecast**

		2008	2009	2010	2011	2012	2013	2014	2015	2016
Summer Starting Load			22.9	24.0	25.2	24.1	25.3	26.5	27.9	31.3
Base Load Growth	1.00%		0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3
Dairy Growth	4.00%		0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.3
Dairy Plant	4.0								2.0	2.0
Meat Processing Plant	-3.25				-2.4					
Embedded Generation	3.8		3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8

Summer Ending Load		22.9	27.8	29.0	27.9	29.1	30.3	31.7	35.1	38.6
Winter Starting Load		22.9	23.6	24.3	22.6	23.3	24.0	24.7	24.7	26.9
Base Load Growth	1.00%		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Dairy Growth	2.00%		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Meat Processing Plant	-3.25				-2.4					
Dairy Plant	4.0								1.5	1.5
Transfer	2.00%		0.2	0.2	0.5	0.5	0.5	0.5	0.5	0.5
Embedded Generation	3.8		3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Winter Ending Load		22.8	27.6	28.3	26.9	27.5	28.2	29.0	31.2	33.6

Table 4 in the appendix and the following figures.

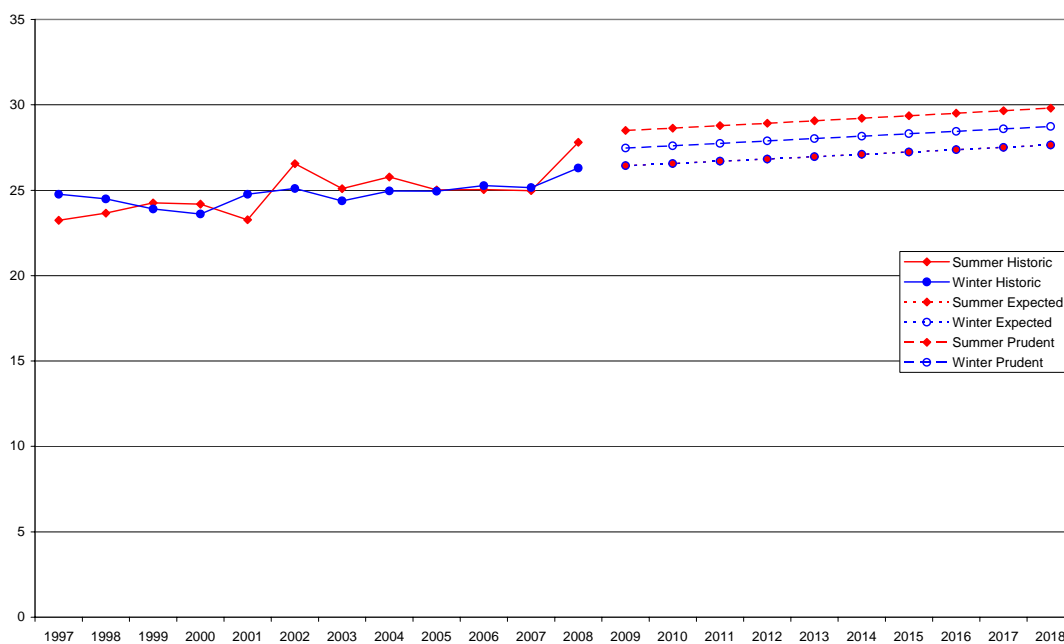


Figure 1: Balclutha GXP Load Forecast

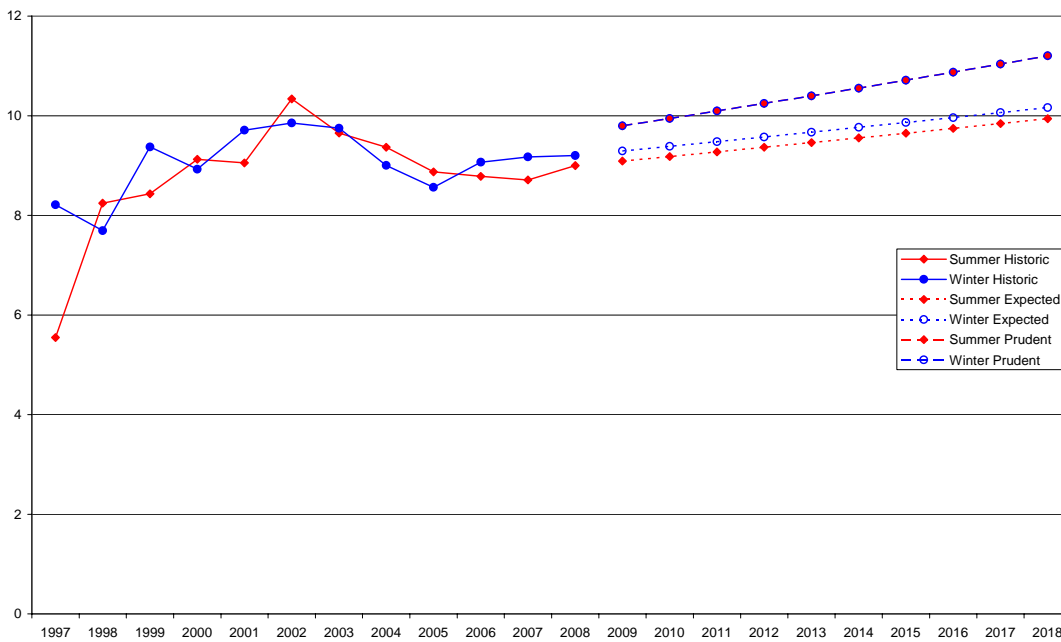


Figure 2: Brydone GXP Load Forecast

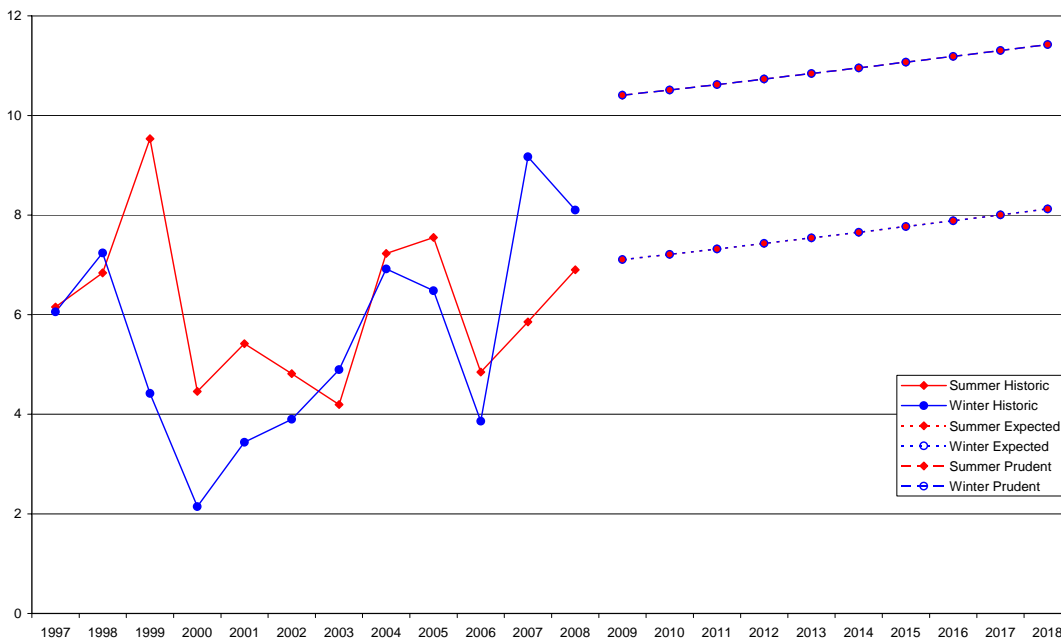


Figure 3: Clyde GXP Load Forecast

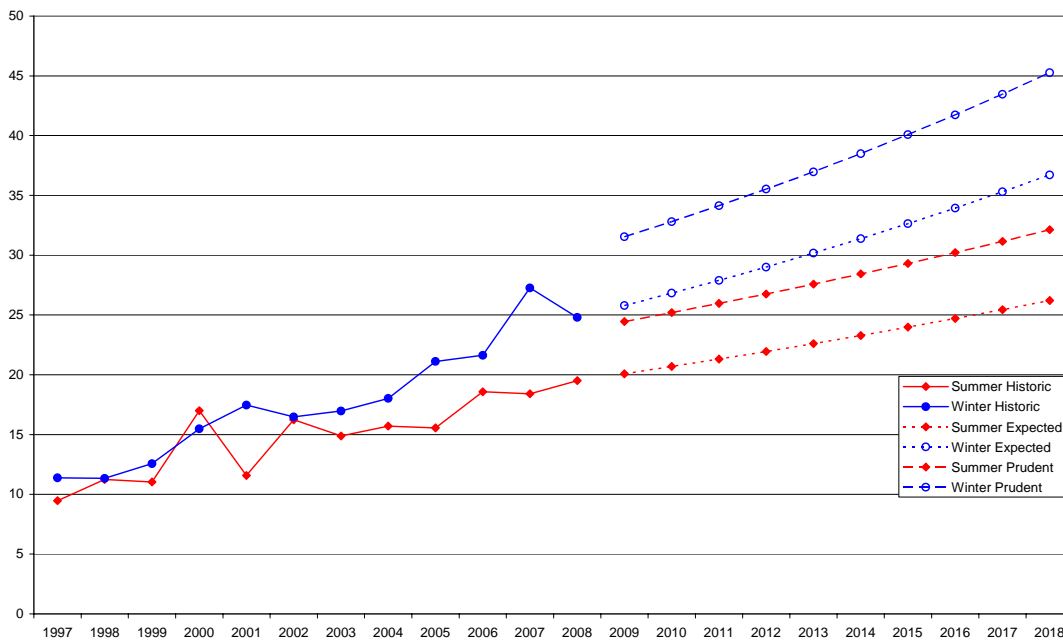


Figure 4: Cromwell GXP Load Forecast

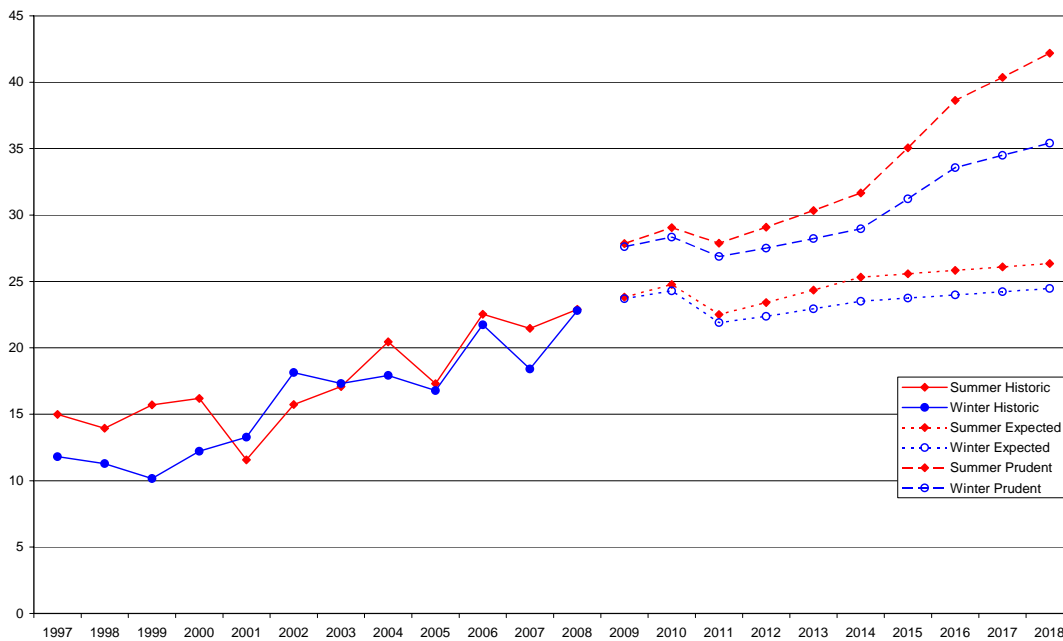


Figure 5: Edendale GXP Load Forecast

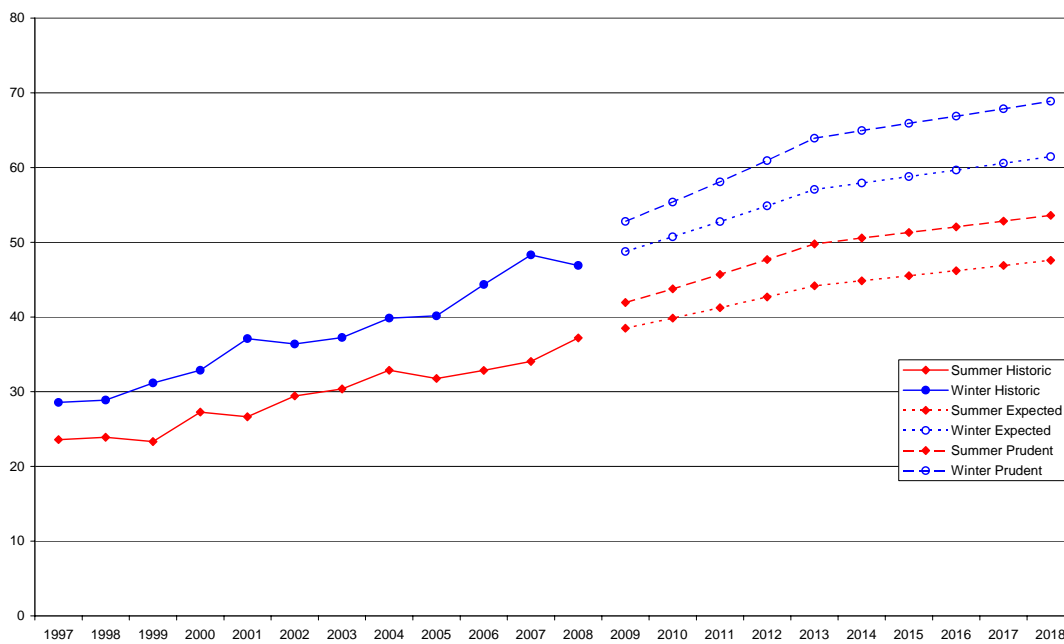


Figure 6: Frankton GXP Load Forecast

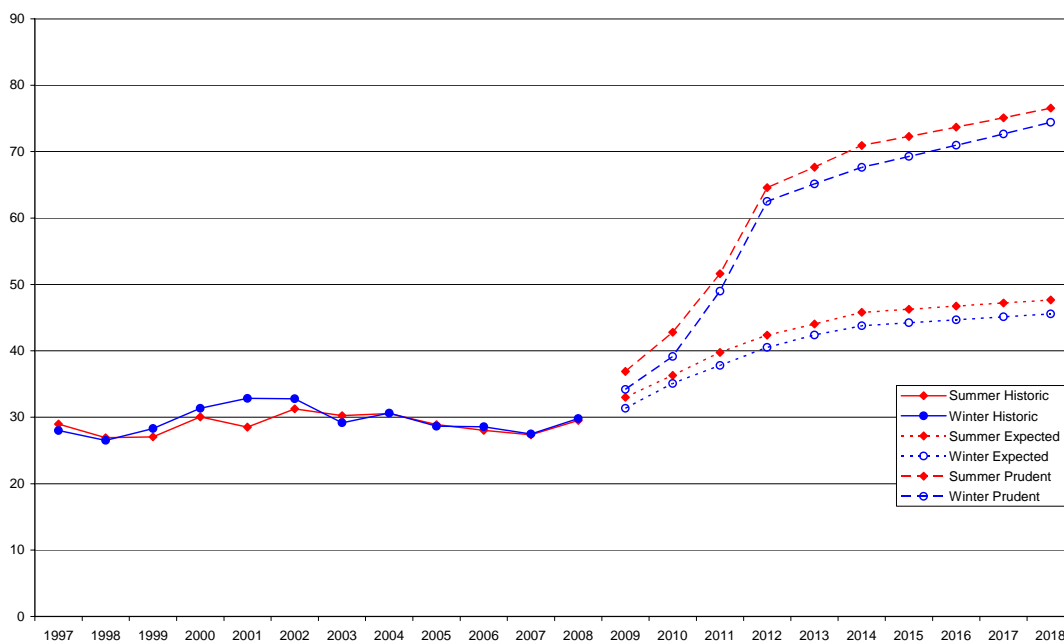


Figure 7: Gore GXP Load Forecast

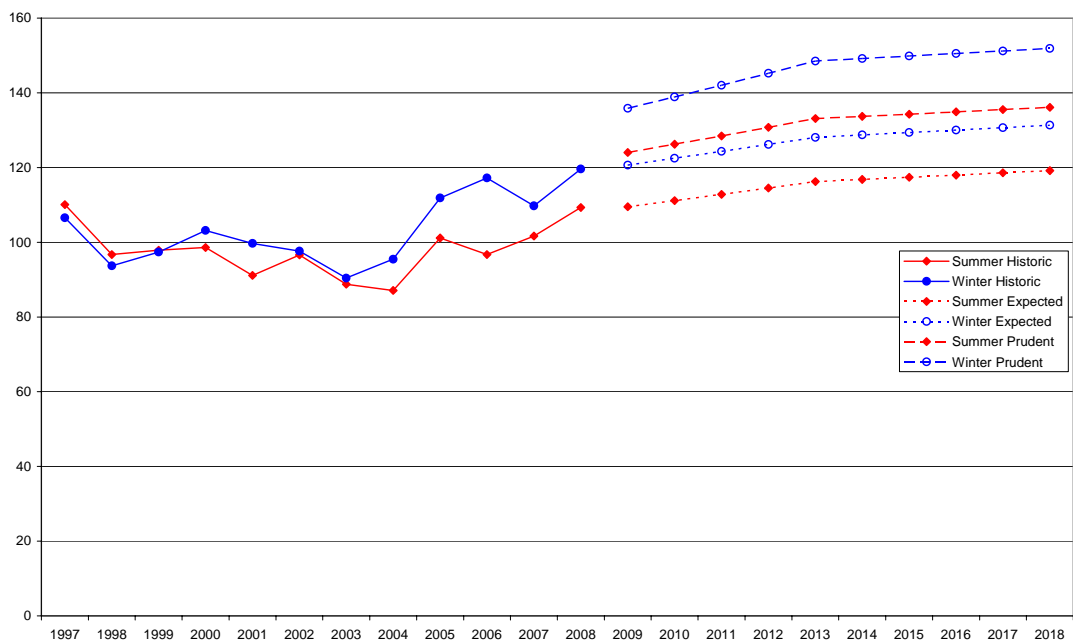


Figure 8: Halfway Bush GXP Load Forecast

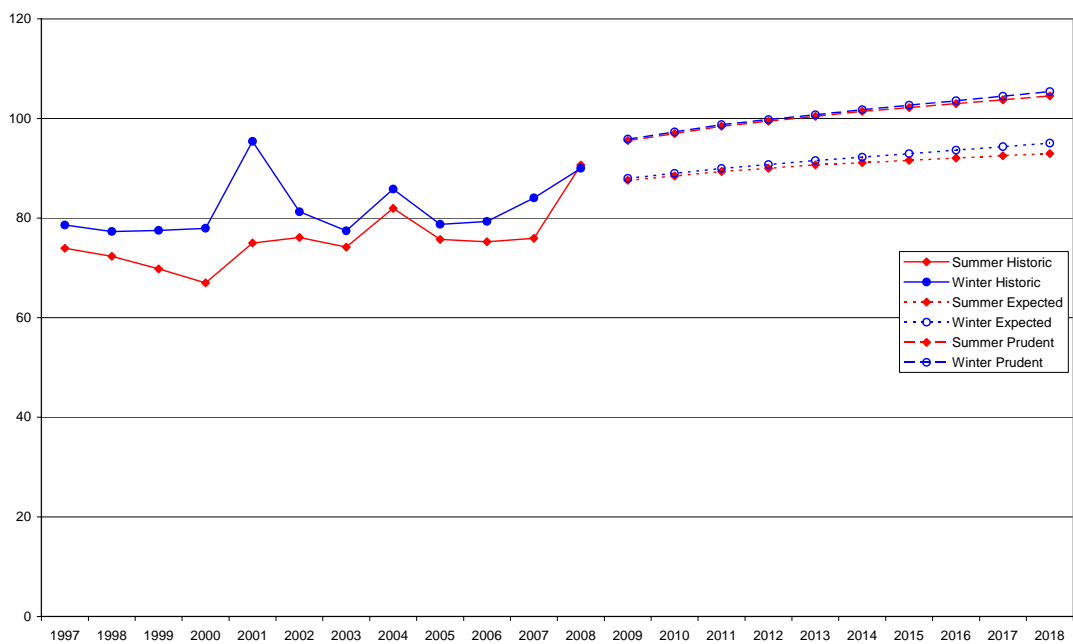


Figure 9: Invercargill GXP Load Forecasts

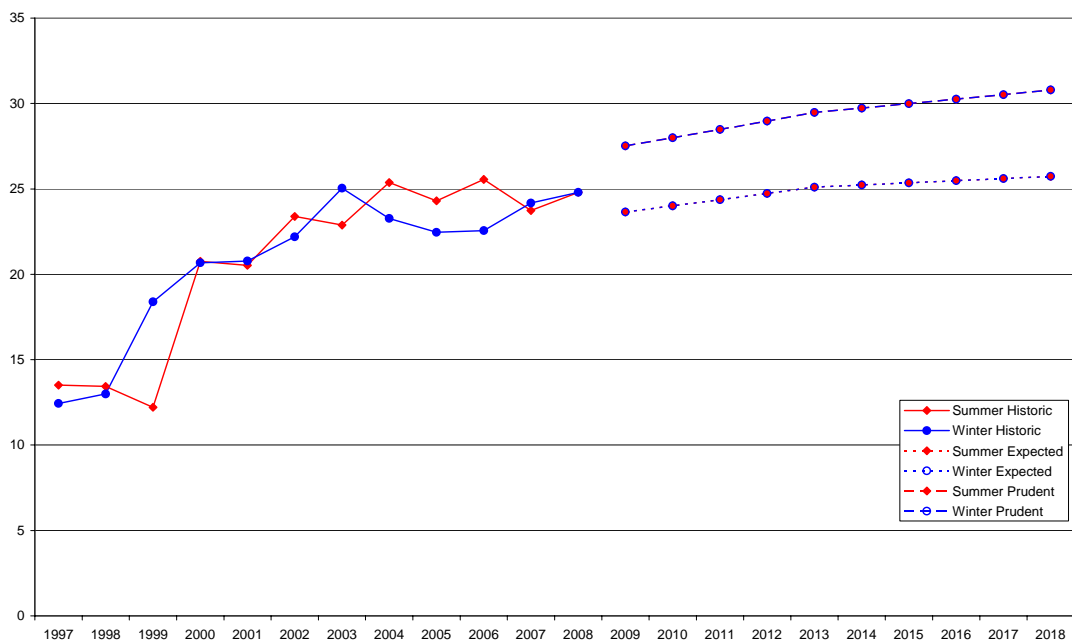


Figure 10: Naseby GXP Load Forecast

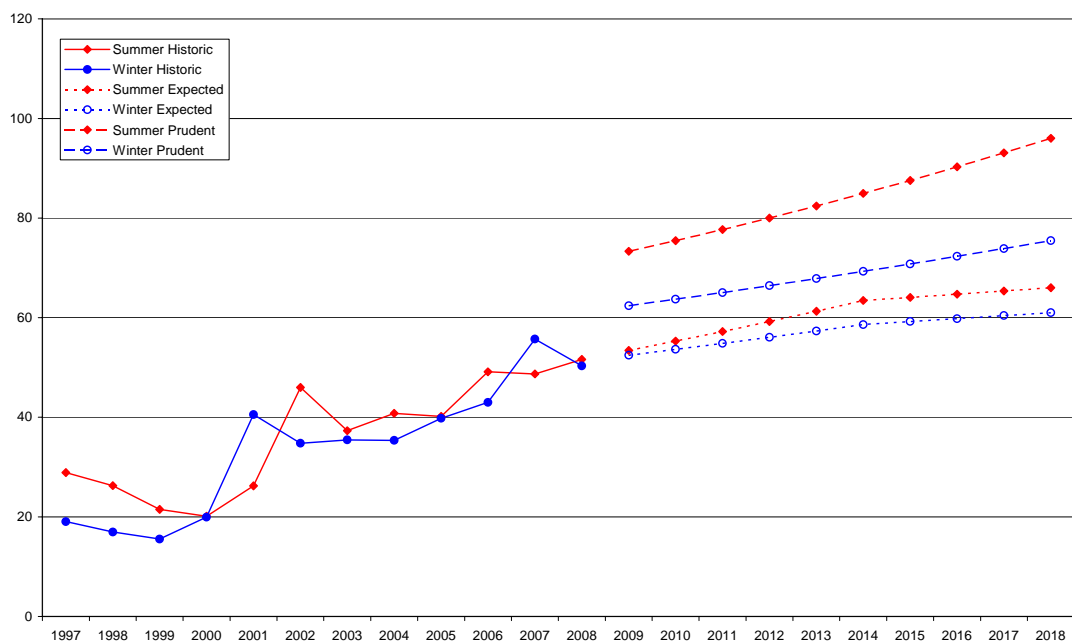


Figure 11: North Makarewa GXP Load Forecast

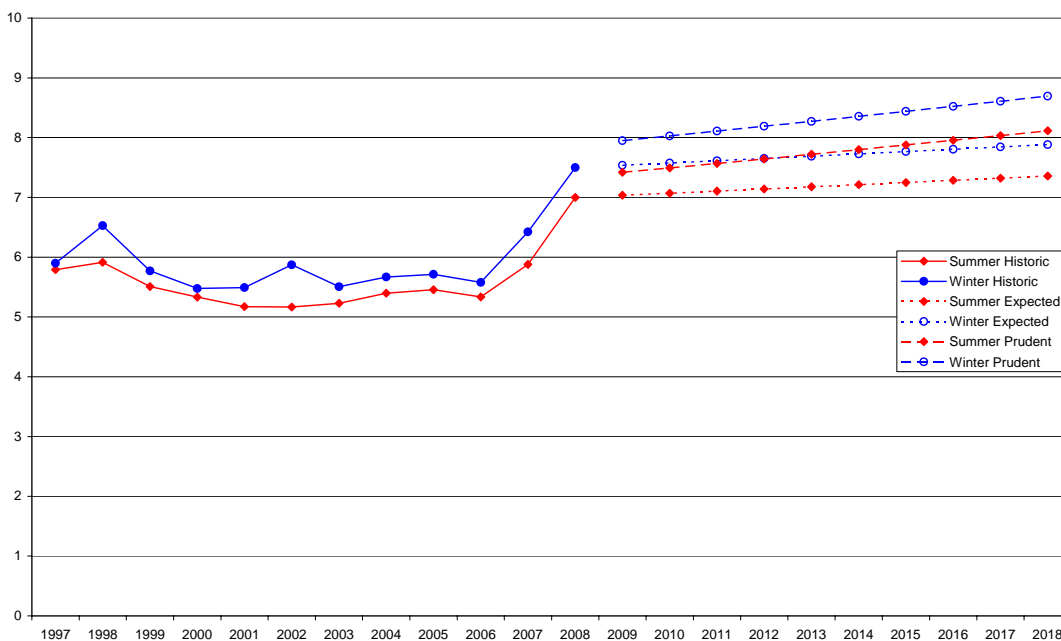


Figure 12: Palmerston GXP Load Forecast

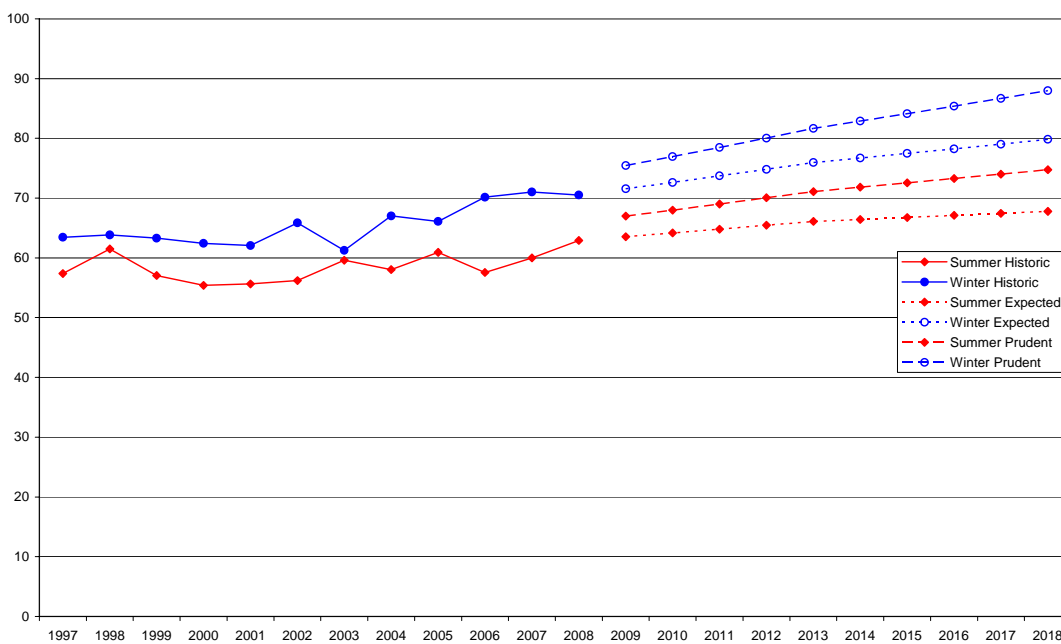


Figure 13: South Dunedin GXP Load Forecast

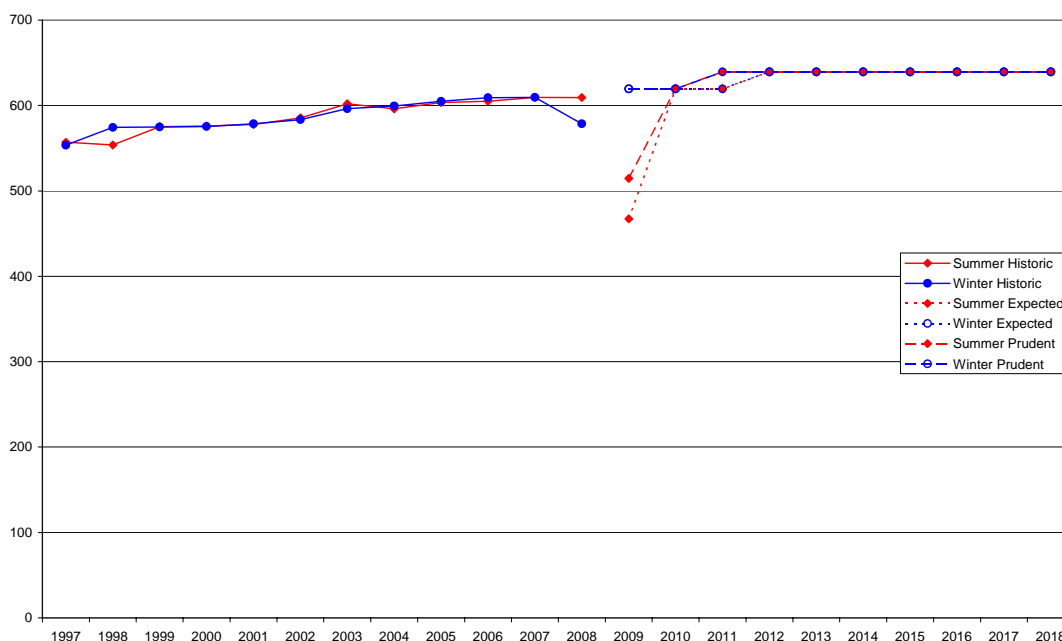


Figure 14: Tiwai GXP Load Forecast

Table 1 gives the forecast load in 2018 for each GXP. The forecasts in this report differ from our earlier forecasts primarily because of the updated base value, season forecast compared to calendar year forecast, inclusion of step loads and treatment of embedded generation. In most cases the variation is only minor but there are significant differences in the forecast load in 2018 between this report and our previous forecast in July 2008 for the GXPs of Edendale and Gore. The expected load at Edendale is lower than our previous forecast due to the anticipated closure of a meat processing plant. The prudent forecast is higher due to the possibility of a new dairy plant and embedded generation. Gore’s load has increased considerably due to the expected development of a new dairy plant and pilot coal plant as well as the possibility of a fully operation coal plant.

Table 1: 2018 Forecast GXP Load

GXP	Expected		Prudent		July 2008 Forecasts	
	Summer	Winter	Summer	Winter	Expected	Prudent
Balclutha	27.6	27.6	29.8	28.7	26.5	28.1
Brydone	9.9	10.2	11.2	11.2	9.9	11.3
Clyde	8.1	8.1	11.4	11.4	8.0	11.8
Cromwell	26.2	36.7	32.1	45.3		
Edendale	26.3	24.5	42.2	35.4	30.2	33.9
Frankton	47.6	61.5	53.6	68.9		
Gore	47.7	45.6	76.5	74.4	32.8	36.2
Halfway Bush	119.2	131.3	136.1	151.9	128.0	140.7
Invercargill	93.0	95.0	104.5	105.4	84.5	99.7
Naseby	25.7	25.7	30.8	30.8		
North Makarewa	66.0	61.0	96.0	75.5	69.9	89.3
Palmerston	7.4	7.9	8.1	8.7	6.5	7.3
South Dunedin	67.8	79.8	74.7	88.0	80.8	83.5
Tiwai	639.4	639.4	639.4	639.4	633.3	644.3

Appendix

Table 2: Potential Step Load Changes for the Lower South Island 2008-2018

GXP	Description	Customer	Forecast	Season	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Edendale	Dairy Plant	Fonterra	Prudent	Summer								2.0	2.0		
Edendale	Dairy Plant	Fonterra	Prudent	Winter								1.5	1.5		
Edendale	Meat Processing Plant	Alliance	Expected	Both				-3.3							
Edendale	Meat Processing Plant	Alliance	Prudent	Both				-2.4							
Gore	Dairy Plant	Mataura Valley Milk	Expected	Summer		2.0	2.0	2.0	1.0						
Gore	Dairy Plant	Mataura Valley Milk	Expected	Winter			1.5	1.5	1.5	0.5					
Gore	Dairy Plant	Mataura Valley Milk	Prudent	Summer		3.0	3.0	1.0							
Gore	Dairy Plant	Mataura Valley Milk	Prudent	Winter			2.5	2.5	1.0						
Gore	Pilot Coal Plant	Solid Energy	Both	Both			1.2								
Gore	Full Coal Plant	Solid Energy	Prudent	Both				5.8	10.5						
Halfway Bush	Meat Processing Plant	Silverfern farms	Both	Summer	-1.4										
Halfway Bush	Meat Processing Plant	Silverfern farms	Both	Winter	-0.7										
Naseby	Gold Mine Transfer	Oceana Gold	Both	Both	-1.5										
Palmerston	Gold Mine Transfer	Oceana Gold	Both	Both	1.5										
Tiwai	Aluminium Smelter	Rio Tinto	Expected	Summer			10.0		20.0						
Tiwai	Aluminium Smelter	Rio Tinto	Expected	Winter		10.0			20.0						
Tiwai	Aluminium Smelter	Rio Tinto	Prudent	Summer			10.0	20.0							
Tiwai	Aluminium Smelter	Rio Tinto	Prudent	Winter		10.0		20.0							

Table 3: Edendale Prudent GXP Load Forecast

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Summer Starting Load			22.9	24.0	25.2	24.1	25.3	26.5	27.9	31.3	34.8	36.6
Base Load Growth	1.00%		0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4
Dairy Growth	4.00%		0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.3	1.4	1.5

Dairy Plant	4.0								2.0	2.0		
Meat Processing Plant	-3.25				-2.4							
Embedded Generation	3.8		3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Summer Ending Load		22.9	27.8	29.0	27.9	29.1	30.3	31.7	35.1	38.6	40.4	42.2
Winter Starting Load			22.9	23.6	24.3	22.6	23.3	24.0	24.7	26.9	29.2	30.1
Base Load Growth	1.00%		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Dairy Growth	2.00%		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Meat Processing Plant	-3.25				-2.4							
Dairy Plant	4.0								1.5	1.5		
Transfer	2.00%		0.2	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Embedded Generation	3.8		3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Winter Ending Load		22.8	27.6	28.3	26.9	27.5	28.2	29.0	31.2	33.6	34.5	35.4

Table 4: Expected and Prudent GXP load forecasts by Season to 2018

GXP	Season Forecast	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Balclutha	Summer Expected	26.4	26.6	26.7	26.8	27.0	27.1	27.2	27.4	27.5	27.6
	Winter Expected	26.4	26.6	26.7	26.8	27.0	27.1	27.2	27.4	27.5	27.6
	Summer Prudent	28.5	28.6	28.8	28.9	29.1	29.2	29.4	29.5	29.7	29.8
	Winter Prudent	27.5	27.6	27.7	27.9	28.0	28.2	28.3	28.4	28.6	28.7
Brydone	Summer Expected	9.1	9.2	9.3	9.4	9.5	9.6	9.6	9.7	9.8	9.9
	Winter Expected	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	10.1	10.2
	Summer Prudent	9.8	9.9	10.1	10.2	10.4	10.6	10.7	10.9	11.0	11.2
	Winter Prudent	9.8	9.9	10.1	10.2	10.4	10.6	10.7	10.9	11.0	11.2
Clyde	Summer Expected	7.1	7.2	7.3	7.4	7.5	7.7	7.8	7.9	8.0	8.1
	Winter Expected	7.1	7.2	7.3	7.4	7.5	7.7	7.8	7.9	8.0	8.1
	Summer Prudent	10.4	10.5	10.6	10.7	10.8	11.0	11.1	11.2	11.3	11.4
	Winter Prudent	10.4	10.5	10.6	10.7	10.8	11.0	11.1	11.2	11.3	11.4
Cromwell	Summer Expected	20.1	20.7	21.3	21.9	22.6	23.3	24.0	24.7	25.4	26.2
	Winter Expected	25.8	26.8	27.9	29.0	30.2	31.4	32.6	33.9	35.3	36.7

	Summer Prudent	24.5	25.2	26.0	26.8	27.6	28.4	29.3	30.2	31.2	32.1
	Winter Prudent	31.5	32.8	34.1	35.5	37.0	38.5	40.1	41.7	43.5	45.3
Edendale	Summer Expected	23.8	24.8	22.5	23.4	24.3	25.3	25.6	25.8	26.1	26.3
	Winter Expected	23.7	24.3	21.7	22.2	22.7	23.3	23.5	23.8	24.0	24.2
	Summer Prudent	27.8	29.0	27.9	29.1	30.3	31.7	35.1	38.6	40.4	42.2
	Winter Prudent	27.6	28.3	26.6	27.3	28.0	28.7	31.0	33.3	34.2	35.1
Frankton	Summer Expected	38.5	39.8	41.2	42.7	44.2	44.8	45.5	46.2	46.9	47.6
	Winter Expected	48.8	50.7	52.8	54.9	57.1	57.9	58.8	59.7	60.6	61.5
	Summer Prudent	41.9	43.8	45.7	47.7	49.8	50.6	51.3	52.1	52.8	53.6
	Winter Prudent	52.8	55.4	58.1	60.9	63.9	64.9	65.9	66.9	67.9	68.9
Gore	Summer Expected	33.0	36.3	39.8	42.4	44.0	45.8	46.3	46.7	47.2	47.7
	Winter Expected	31.4	35.1	37.8	40.5	42.4	43.8	44.2	44.7	45.1	45.6
	Summer Prudent	36.9	42.8	51.6	64.6	67.7	70.9	72.3	73.7	75.1	76.5
	Winter Prudent	34.2	39.2	49.0	62.5	65.1	67.6	69.3	70.9	72.7	74.4
Halfway Bush	Summer Expected	109.5	111.2	112.8	114.5	116.2	116.8	117.4	118.0	118.6	119.2
	Winter Expected	120.7	122.5	124.3	126.2	128.1	128.7	129.4	130.0	130.7	131.3
	Summer Prudent	124.0	126.2	128.5	130.8	133.1	133.7	134.3	134.9	135.5	136.1
	Winter Prudent	135.8	138.9	142.0	145.2	148.5	149.2	149.8	150.5	151.2	151.9
Invercargill	Summer Expected	87.6	88.4	89.3	90.0	90.7	91.1	91.6	92.0	92.5	93.0
	Winter Expected	88.0	89.0	90.0	90.8	91.6	92.2	92.9	93.6	94.3	95.0
	Summer Prudent	95.5	97.0	98.4	99.4	100.4	101.4	102.2	103.0	103.7	104.5
	Winter Prudent	95.9	97.3	98.7	99.8	100.8	101.8	102.7	103.6	104.5	105.4
Naseby	Summer Expected	23.6	24.0	24.4	24.7	25.1	25.2	25.4	25.5	25.6	25.7
	Winter Expected	23.6	24.0	24.4	24.7	25.1	25.2	25.4	25.5	25.6	25.7
	Summer Prudent	27.5	28.0	28.5	29.0	29.5	29.7	30.0	30.3	30.5	30.8
	Winter Prudent	27.5	28.0	28.5	29.0	29.5	29.7	30.0	30.3	30.5	30.8
North Makarewa	Summer Expected	53.4	55.3	57.2	59.2	61.3	63.4	64.1	64.7	65.4	66.0
	Winter Expected	52.4	53.6	54.8	56.1	57.3	58.6	59.2	59.8	60.4	61.0
	Summer Prudent	73.3	75.5	77.7	80.0	82.4	84.9	87.6	90.3	93.1	96.0
	Winter Prudent	62.4	63.7	65.0	66.4	67.8	69.3	70.8	72.3	73.9	75.5
Palmerston	Summer Expected	7.0	7.1	7.1	7.1	7.2	7.2	7.2	7.3	7.3	7.4
	Winter Expected	7.5	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.9

	Summer Prudent	7.4	7.5	7.6	7.6	7.7	7.8	7.9	8.0	8.0	8.1
	Winter Prudent	8.0	8.0	8.1	8.2	8.3	8.4	8.4	8.5	8.6	8.7
South Dunedin	Summer Expected	63.5	64.2	64.8	65.5	66.1	66.4	66.8	67.1	67.4	67.8
	Winter Expected	71.6	72.6	73.7	74.8	75.9	76.7	77.5	78.2	79.0	79.8
	Summer Prudent	67.0	68.0	69.0	70.0	71.1	71.8	72.5	73.3	74.0	74.7
	Winter Prudent	75.4	76.9	78.5	80.1	81.7	82.9	84.1	85.4	86.7	88.0
Tiwai	Summer Expected	467.4	619.4	619.4	639.4	639.4	639.4	639.4	639.4	639.4	639.4
	Winter Expected	619.4	619.4	619.4	639.4	639.4	639.4	639.4	639.4	639.4	639.4
	Summer Prudent	514.7	619.4	639.4	639.4	639.4	639.4	639.4	639.4	639.4	639.4
	Winter Prudent	619.4	619.4	639.4	639.4	639.4	639.4	639.4	639.4	639.4	639.4