

MINUTES OF THE LOWER SOUTH ISLAND STAKEHOLDER CONFERENCE HELD ON 10 OCTOBER 2008 IN INVERCARGILL

ATTENDEES

Alliance - Frank Wilson
Clutha District Council - Charles Hakkaart, Juno Hayes
Contact Energy - Brent Thomas
Delta - Lindsay McLennan
Dongwha Pattina - Simon Callaghan, James Drummond
Environment Southland - Ken Swinney, Walter Denley
Fonterra - Glenn Sullivan, James Grandiek
Gore District Council - Cliff Bolger
Invercargill City Council - Richard King
L & M Mining - Kent Anson
Meridian Energy - Greg Salmon
NZAS - Andrew Elder
Otago Regional Council - John Threlfall
Pioneer - Peter Dowling
PowerNet - Ahmed Alshadli, Dyson Gentle, Terry Jones, Roger Paterson, Aaron Sinclair, Martin Walton
RTA - Ray Deacon
Silver Fern Farms - Marthinus Hendriks
Southland District Council - Dave Adamson
Transpower - John Clarke, Len Gould, Nalin Pahalawaththa, Siobhan Procter
TrustPower - Richard Spearman
Venture Southland - Jeff Troon, Steve Canny
PowerNet Directors - Cam McCulloch, Doug Fraser, Phil Mulvey.

- Introduction from Chair, PowerNet Chief Executive, Martin Walton.
- Brief introduction around the room by all attending.

TRANSPOWER

Transpower is preparing a Grid Upgrade Plan (GUP) for the region and has already identified a number of issues. Transpower would like feedback from the region's stakeholders to determine if further issues which have not been considered may have an impact.

- The Southern region includes all of Southland and Otago except for North Otago.
- It accounts for a sixth of New Zealand's winter peak demand at 1100MW. NZAS uses a constant 610MW and accounts for 70% of the regions energy usage.
- The region also has close to 1500MW of hydro generation and is developing some wind generation. New generation schemes are set to increase this value.
- Generation feeds in to the grid and the power is transported via 220kV and 110kV transmission lines to local distribution networks and direct connected customers.
- As generation is normally in excess of the region demand up to 500MW can be exported north.
- The region can also import up to 500MW in times of low generation.

Transpower's transmission consists of twin double circuit 220kV lines from Manapouri to Tiwai via North Makarewa and Invercargill and a 220kV ring between Roxburgh, Invercargill, North Makarewa and Dunedin. The rest of the South Island is connected to the southern region with a double circuit 220kV line from Roxburgh via Cromwell and Clyde and by a third 220kV line also from Roxburgh.

There is also an 110kV line from Invercargill to Gore and a ring between Gore, Roxburgh, Halfway Bush and Balclutha.

The region can be importing or exporting up to 500MW with a lack of lake storage a factor in this variability. New generation projects are being proposed which will increase the export from the region. Coupled with the general load growth the 110kV network is becoming a constraint on operation of the large generators. Load growth is causing constraints on the line between Edendale and Gore.

Transpower is considering supply to growing demand as well as export of generation in the GUP.

AURORA'S NETWORK

Cover two areas:

Dunedin and Clyde, Alexandra, Cromwell, Wanaka, Queenstown and Frankton.

Discussed physical network parameters, stakeholders, reliability statistics and trends. SAIDI is reducing at 3% per annum compared to a national trend of 1.4%. Analysis is done down to feeder level to allow targeting of poorly performing feeders.

Aurora carries out a monthly reliability survey on reliability as well as a detailed telephone survey annually to ensure a good balance between reliability and price. Demand on the network is quite peaky with 50% of line charge revenue when the network is highly loaded during 200 hours peak demand.

Ripple control is implemented on the network to control warning devices, deferrable load and standby generators.

POWERNET'S NETWORK

PowerNet manages three main networks:

The Power Company Limited (TPCL) generally covering Southland with ringed subtransmission providing good backup security.

Electricity Invercargill Limited (EIL) covering Invercargill and Bluff - a simple network, predominantly underground with good back up capability.

OtagoNet Joint Venture (OJV) which is made up of Northern and Southern areas of Otago. Lines are relatively radial following river valleys but with a degree of backup available in the southern area.

Loading of network GXP's shown.

PowerNet has a mixture of hydro, wind and some waste wood embedded generation. PowerNet also manages a small network in Frankton and an Island Network on Stewart Island.

VENTURE SOUTHLAND

Southland covers about 12% of the land area of New Zealand but has only 2.3% of the population at 94,000 people.

Venture Southland is looking at three scenarios from a business as usual where population is decreasing to strong growth taking population beyond 120,000 by 2030.

Projected land use predicts a large amount of conversion from sheep farming to dairy with forestry remaining relatively constant. Currently the dairy industry is growing at 15% each year.

This is having a large impact on PowerNet's networks and predictions show large growth continuing in many areas in Southland.

Discussion of Tiwai left to later presentation.

Southland has large lignite reserves; 6 billion tonnes making up 72% of New Zealand's total reserves and should provide 400 years supply. This is very likely to attract large mining and processing infrastructure.

L&M Lignite has shown interest in establishing a lignite to liquid plant in the Waituna area making use of the high quality lignite reserves. Consumption estimated at 690MW with on site generation at 690MW which would require direct grid connection. The plant would cover about 70 hectares and require employment of up to 2,700 staff for construction over a 3.5 year period. 675 operations staff would be employed at the plant which would produce 51,000 barrels per day (8.2 million litres) of Fischer Tropf liquids.

Southland also contains large silicon reserves, about 1,000 million tonnes of 98% pure silicon dioxide. There is large interest from three international companies. Energy requirements for a processing plant would probably be 100MW which could be grid connected or supplied by an embedded generator powered by locally available lignite or coal.

Solander Ridge has good hydrate potential in Western Southland and off the Southern Coast.

\$1.2 million has been committed for exploration of the great southern basin for oil, gas and minerals. Initial exploration is expected to take 1-5 years with drilling in a 2-10 year time frame and full development in 10-25 years. A pipeline to transport gas onshore could potentially be constructed.

There is a large amount of potential generation that may be developed in the Southern Region including:

- Hydro stations at Beaumont and on the Waiau between Manapouri and Te Anau.
- Wind farms at Blackmount, Longwoods west of Otautau and Kaiwera Downs and Slope Down in Eastern Southland.
- Gas generation is likely near Ohai.
- There is also potential for reserve generation for the South Island if exploration of the great southern basin is successful.

Employment and GDP projections show significant growth for the region, possibly up to 3.4%.

Potential industries may be affected by electricity constraints and companies are considering energy potential near to good electricity supplies.

FONTERRA

Fonterra's main site is at Edendale and produces milk powder, cheese, lactose, casein and WPC. The plant has three existing milk dryers and a fourth in construction which when completed will make it the biggest plant in the world.

A second smaller site is located at Stirling and produces cheese and WPC.

Presently there is a high rate of conversion of farms to dairy and one estimate is for 200 conversions in 2009 which would add a further 10MW load to the PowerNet network. At an average rate of 50-90 farms per year or 5.5% - 8.5% growth in milk supply a further 4-7 MW of additional processing capacity will be required in Southland by 2010-2012.

Other competitors are emerging with one in construction at present.

Security of supply is very important for both the Fonterra plant and the dairy farms. A few farms have portable generation available as contingency. A one hour loss of supply to a dairy farm is more of an annoyance however a 24 hour loss of supply can be very distressing to stock and can potentially cause a fall off in production.

For the factory, a 1 hour outage can result in 3-7 hours down time. For the dryers only, loss of supply cost is about \$50,000 per MW of processing capacity. A 24 hour loss of supply is a very bad situation as the milk would be lost and must then be disposed of. This is an environmental issue as the milk would have to be sprayed back onto paddocks.

The factory has to be constructed for peak supply meaning spare capacity is available during off peak times.

Only a small generator is on site to reduce consumption from the local network. There are no plans for further generation on site.

There is opportunity for greater plant optimisation.

The large growth in dairy farming is straining the local network and Fonterra is directing farmers to get in touch with PowerNet as soon as possible.

NZAS

NZAS employs 1,000 staff both full time and contractors. It is a high cost operation producing 350,000 tonnes of aluminium per annum.

The plant is capable of operating at 620MW however it is currently operating at 610MW due to Transpower constraints

In the short term NZAS is in discussion with Transpower and Meridian to increase production to the full cell capacity.

In the next 2-5 years NZAS is looking to increase production to 640MW which would require some capital expense and beyond 5 years is looking to operate at 700MW. This would require significant capital investment (\$200 million) as well as long term economic power price contract to be able to commit to expansion. Metal price will also be an important consideration.

Long term viability of the company is at risk due to the emissions trading scheme.

NZAS is facing problems explaining to its owner's security issues due to the New Zealand market operation and the plant remoteness from generation.

NZAS offers potline tripping of 10% to help ensure security on the grid however does not want to become an alternative to grid upgrades post 2012.

Operation of the plant by coal generation is feasible but a grid connection is preferred.

ALLIANCE

Alliance is a farmer owned cooperative processing mainly sheep and some beef and producing in excess of \$1 billion in exports. The production season is November through to July and is a major contributor to the Southland economy.

The large conversion rate to dairy is reducing sheep farming.

A reduction in lamb production (10%) and mutton kill (25%) is expected for the coming season with beef remaining constant. This will mean a reduction in processing plant with a probable shortening of the production season and possible closure of some plant.

No production growth is anticipated.

Staff are employed to look at energy usage and efficiency of the plant.

Reliability of supply is critical and it is worth noting that low lake levels coincide with low pasture growth and farmers wanting to reduce stock numbers. This means increased meat processing.

A one hour outage is a nuisance however a 24 hour outage is enough for all produce to spoil costing up to \$1 million.

Alliance is aware that growth in dairy is likely to affect security of supply.

Alliance would like a prediction from retailers for electricity prices going forward.

DONGWHA

No growth is anticipated at Dongwha.

A 24 hour outage would cause around \$50,000 in loss of production.

There is no ongoing disruption after power has been restored.

OTAGO REGIONAL COUNCIL / CLUTHA DISTRICT COUNCIL

Regional Councils are being driven by the National Environmental Standard which requires compliance with air quality guidelines by 2013. Continuous monitoring is carried out in several towns in Otago with problems caused mainly by solid fuel heating; multifuel burners and woodburners.

The Council is driving the use of alternative heating with an Air Plan to force a change from non-compliant burners. As part of this plan the Council is educating on use of alternative heating including heat pumps, pellet burners, flued gas and modern woodburners. Subsidies are available from EECA, ORC, TLA etc which are high for those with low income.

The towns of Alexandra, Arrowtown, Cromwell, Clyde and Milton each breach air quality standards between 46-75 days in the year. Generally half of the conversions to alternative heating are utilising heat pumps which would amount to about 1,500 new heat pumps by year 2013.

This is not a huge increase in demand however there is a public perception that security of supply is an issue so there is a reluctance to change to electrical heating. Introduction of heat pumps may smooth out load profiles as air conditioning will be available in the summer months.

The water plan is encouraging more community irrigation schemes which will lead to more infrastructure and pumping demand in the next 10 years. This may lead to a further increase in dairy conversion which is already increasing though not at the rate of growth in Southland.

The current situation is not a problem but depending on growth, issues may arise with supply capacity in future.

AURORA ASSET MANAGEMENT PLAN (AMP)

A lot more people are working from home due to improved communications which is driving a need for greater security of supply.

The Aurora AMP focuses on growth and capital expenditure.

The network peak demand is 290MW and contains a large amount of embedded generation with about 80MW installed.

In the Dunedin area the South Dunedin GXP takes approximately 33% of the load and is growing at 1.6%. The Halfway Bush GXP takes approx 67% of the load and is growing at 1.0%.

In central Otago the Clyde GXP has low growth at 0.8% and includes Alexandra, Roxburgh and Omakau. Peak load occurs fighting frost at Orchards.

The Cromwell GXP supplies an area of high growth at 6.3% and includes Cromwell, Wanaka and Hawea. The Wanaka area is a booming tourist and accommodation area and Cromwell is a satellite town for Queenstown.

The Frankton GXP also supplies an area of high growth at 4.6% and includes Arrowtown, Glenorchy and Queenstown. Peak load tends to occur during school holidays when people migrate to holiday spots.

The 110kV line from Cromwell to Frankton is predicted to become a constraint from 2017.

Capital expenditure is in the region of \$20 million per year. Planned projects for 2009 include a diesel generator for Cardrona and new Commonage zone substation for Queenstown due to growth. Reliability is also driving investment in a new 5MVA mobile zone substation and switchgear for Mosgiel zone sub.

In 2010 transformers at East Taieri sub and switchgear at Frankton sub are required due to growth and renewal of switchgear and transformers at Ward St sub and 33kV cables at Neville St are also required.

In 2011 growth will require a rebuild of Maungawera sub at Hawea and a new Jacks Point zone sub.

Renewal is required due to growth rather than age.

Aurora has been exposed to snow events in the past from which lessons have been learnt.

Some growth is expected due to increased irrigation as well as on flowing dairy conversion.

POWERNET ASSET MANAGEMENT PLANS (AMP)

PowerNet produces an AMP for each of the major networks it manages; The Power Company (TPCL), Electricity Invercargill (EIL) and OtagoNet Joint Venture (OJV). These are next required to be disclosed 31 March 2009. A fourth AMP has recently been created for the SIESA (Stewart Island) network.

PowerNet would like any further relevant input from attending stakeholders.

The AMPs cover the background and objectives, asset details, proposed service levels, plans for development, asset lifecycle management, risk management, funding for the business, processes and systems used and performance and improvement.

A table displaying stakeholders and their interests in the company as considered by PowerNet was displayed and feedback requested if any inaccuracies were seen. SAIDI and SAIFI are the main service level thresholds to be maintained.

Reliability standards are also maintained with requirements for backup and time to restore power based on group capacity and number of customers. Individual customer requirements are also taken into consideration.

The TPCL network is experiencing large growth over 3% per annum due to a high rate of conversion to dairy farming, associated irrigation schemes and new subdivisions.

OJV also has significant growth though not the level experienced on TPCL's network while EIL has low growth.

Other drivers of growth in the region are distributed generation, forestry, mining and processing, oil and tourism.

PowerNet is not planning any major expansion for EIL and OJV with the main emphasis on renewal and upgrading of existing equipment.

The TPCL network is looking to extend a 66kV line from Mossburn to Kingston, replace sections of 33kV lines with 66kV for increased capacity and extend 66kV lines into central areas surrounded by subtransmission rings.

CONTACT ENERGY

28% of the generation in New Zealand belongs to Contact Energy with installed capacity of 2000 MW. The generation schemes in the lower South Island are the Clyde (432MW) and Roxburgh (320 MW) hydro stations.

There is expected future growth in generation schemes in New Zealand and \$3 billion is being invested over the next 5 years.

One of those projects is in the lower South Island - the Hawea gates project is up for board approval in November 2008. It should add an extra 17MW of hydro generation in the South Island.

Lake Hawea has some storage but is essentially a “run of the river” from Lake Wanaka.

More projects will be looked at beyond 2020.

The transmission grid has not kept up with the pace of growing electricity demand, investments in new generation and changing power flows. A modern and robust transmission system is needed to ensure electricity makes its way to the market and to ensure a secure supply of electricity. This is particularly important to connect renewables which tend to be distant from load.

Constraints at the moment include the HVDC link which affects the amount of investment in the South Island as the power cannot be transported to the North Island.

Another constraint is the 110kV system which limits the Roxburgh hydro generation to less than 90MW. The biggest issue for Contact Energy is the ROX T10 interconnection transformer which requires addressing to remove the generation constraint.

Contact Energy has a large retail base in the southern region with 108,000 ICPs connected. This accounts for 65% of total connections and amounts for 1500GWh pa. Contact Energy is interested in South Island security of supply due to its large customer's base.

Finally, Contact supports Transpower current investment programme which is seeking to address historic under-investment.

MERIDIAN

Meridian has significant investments in the South Island and is developing further options.

It is committed to supplying power to RTANZ which is the largest customer in New Zealand.

It is also keen to work with the dairy industry and provide technology initiatives for farmers.

Meridian generation plants in the southern region are Manapouri and White Hills. Manapouri is constrained to 730MW but is lodging an application in December to increase the discharge into Doubtful Sound and utilise the full station capability of 840 MW. Manapouri storage is limited therefore it can't provide a supply guarantee.

White Hill generates 58 MW into the PNL network and the national grid at North Makarewa. Meridian needs to consider additional spill capture versus increased transmission charges.

Another new generation investment project is the Hayes project. Meridian is seeking consent for an extra 176 wind turbines (generating up to 630 MW) with a decision due mid next year. There is uncertainty on when the construction will commence but supply is expected to start in 18 months - 2 years.

Meridian is committed to providing future generation options and supporting improved transmission into the region.

When asked if the regulations can be changed during emergency demand times, the reply was that it will be unlikely.

PIONEER

Pioneer's generation schemes include 12 small hydro stations located throughout Central Otago and Southland (Monowai).

There has been major refurbishment to increase generation output at Monowai by 30%. Pioneer is also investigating wind generation near Monowai (generating 12-15MW).

Pioneer has applied for consent for hydro on the Teviot River. Commissioning is expected in 2010.

Three wind turbines are planned for installation at Horseshoe Bend in January 2009 and will be embedded in the local network.

There is also a Nevis hydro proposal on the Kawarau River however there is some competition from Fish and Game for river use. This project is likely to be some time away. If the project goes ahead, generation of up to 45MW is possible which may help with the Queenstown issues if supplied directly into the local network which is being considered along with Transpower connection.

TRUSTPOWER

The Waipori Hydro generation plant is located 40 km West of Dunedin. It generates 85MW. The power is injected into the local network and into the Transpower 110kV network. The plant has a flexible operating regime as the lake it operates in is a relatively large lake.

There are two new wind generation schemes planned for the foreseen future. They are the Mahinerangi and the Kaiwera Downs Wind schemes.

Mahinerangi will be located 50 km west of Dunedin, will consist of 100 turbines, and have capacity to generate 200MW (800GWh/pa max). The farm will connect into the local network and the Transpower 110kV network.

The project is waiting for consenting from the Environment Court. An interim decision has been given but there is a possibility of another small hearing.

Hurdles for the project are the constraints on the 110kV transmission network (T10), the HVDC pricing methodology (a high premium is required of South Island generators), the turbine supply and the exchange rate.

The other project is the Kaiwera Downs wind generation plant, to be located 15 km South East of Gore. It is to consist of 83 turbines and is sized at 240MW (904GWh/pa max). The farm will connect directly into the Transpower 220kV network.

The project is waiting on consenting subject to Environment Court Appeal with the hearing expected in 2009.

Hurdles for this project are the HVDC methodology, turbine supply and the exchange rate.

TRANSPOWER'S ROLE IN DEVELOPING THE GRID

Transpower identifies a need for investment in the grid and develops proposals to address the need. These are submitted to the Electricity Commission for approval in which case Transpower can recover investment through charges on all grid users. Transpower can invest in the grid on behalf of a customer if the customer meets the cost directly.

Investment can be based on reliability; the primary purpose is to ensure that demand is met for credible power system events (loss of part of the transmission system) or when generation in the region is low.

The security standard for the core grid is 'n-1' (for more than 150MW) which should be maintained for the lowest cost.

The security for non-core grid is 'n' where the expected net market benefit must be positive for an investment.

Critical inputs for justifying grid investment are demand forecast within the region and the cost of interruption to customer supply.

New generation projects come under a separate work stream ("Transmission to Enable Renewables"). Planned work in the lower South Island region has been put on hold awaiting the outcome of other work but should recommence early 2009.

The process starts by confirming a need for upgrade based on demand forecasting, regional grid plans etc. A long list of options is then created with input from stakeholders followed by a short list with more involved analysis and costing before submitting a grid upgrade proposal (GUP) to the Electricity Commission for approval.

The Electricity Governance Rules set out how investment is progressed.

Grid investments are subject to a Grid Investment Test "GIT".

The time line for the upgrade process should look something like the following:

- October/November - confirm inputs on demand and generation constraints.
- End November/early December - meet to review and consider possible long list of solutions.
- January/March 2009 - finalise demand forecast and detailed studies on long list by Transpower.
- April 2009 - meet and consult to identify short list options and review draft regional plan.
- June/July 2009 - finalise Grid Upgrade Proposal and regional plan.
- July 2009 - submission of GUP to EC for approval.

The rules governing the process have only been in place a short time and Transpower is still finding its way with them.

Transpower is committed to seeking input from stakeholders and keeping them informed.

TRANSPOWER DEMAND FORECASTING

Demand forecasts used are

- a national energy forecast in GWh which is based on economic modelling;
- a regional energy forecast based on population and GDP trends; and
- forecasts for GXP expected peak demand with an excess probability of 50% and prudent peak representing 10% probability of exceedance.
- Transpower uses prudent peak for planning.

The economic model used assumes that population, GDP, electricity price and number of dwellings are the key drivers of energy growth. For the southern region forecast, population has a large influence although the influence of GDP is being increased. Forecast for these drivers are then used to forecast energy growth which is considered in three sections; residential which takes all four drivers into account, commercial and industrial which uses only GDP and heavy industrial customers (ie Tiwai) which have an individual forecast based on history.

A comment was made from Environment Southland that this process is very much at arms length and does not take into account local knowledge or for an increase in embedded generation.

It is a requirement to use the Electricity Commission's forecast as a starting point however this may be modified if there are known step changes in load, generation etc predicted.

Demand forecasting is becoming more uncertain at GXP level.

Forecasts are highly dependant on model assumptions and input.

Transpower needs to take more local knowledge into account in forecasting.

A question was asked if the peak demand is becoming a summer peak rather than winter and if this affects models. It was noted that BDE and EDN are currently summer peak loads.

The difference between summer and winter is decreasing driven mainly by the increase in dairy and irrigation. The model takes into account peak demand not just winter peak.

Transpower indicated they will be canvassing participants for information about step load changes and specifically requesting size, location, timing and probability.