

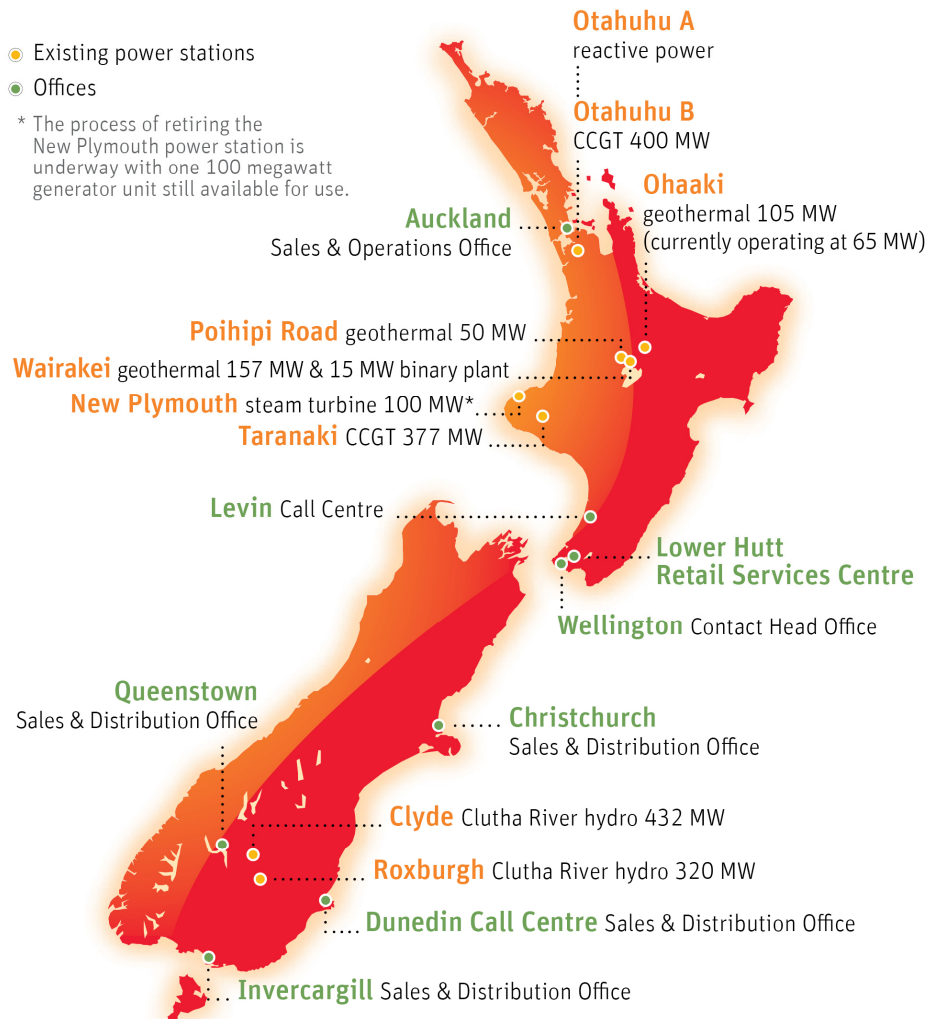
BACKGROUND

1. My full name is Andrew John Sommerville and I am employed as the Senior Environmental Advisor to Contact Energy Limited ("Contact").
2. I am a Member of IPENZ being qualified with Bachelor of Engineering as a mechanical engineer and have been employed in a number of different roles in the electricity business for the past 31 years. For the past 16 years I have been predominantly employed doing environmental and property related work.
3. At various stages and to varying degrees I have worked on all of Contact's electricity generating sites and been involved with many of Contact's development projects. I have been mostly involved in working on Contact's thermal power stations.
4. In this evidence I will outline Contact, its existing generation facilities, and its new generation projects.

Contact Energy

5. Contact has been operating as an electricity generator since 1996, when it acquired a portfolio of electricity and gas assets from ECNZ. It is now one of New Zealand's largest energy companies, generating 28 per cent of the country's total electricity, with nearly 2,000 MW of installed capacity.
6. As at the end of its last financial year Contact had around 650,000 customers to which it supplied electricity and gas products and services. It is listed on the New Zealand Stock Exchange and has about 84,000 New Zealand shareholders, and 1,000 staff located around the country.

7. Below is a map of Contact's current operations in New Zealand:



8. Contact's electricity generating stations are diverse and consist of:

- Baseload thermal in the form of the gas fired Otahuhu B and TCC power stations located at Otahuhu and Stratford respectively.; and
- The renewable generation stations of;
 - Wairakei, Poihipi and Ohaaki – each being a geothermal power station
 - Clyde and Roxburgh – these being hydro power stations on the Clutha River.

9. Between them, Contact's power stations deliver approximately 28% of New

Zealand's electricity. Contact's renewable stations in a normal year deliver approximately 52% of Contact's generation and therefore its renewable generation supplies around 14% of New Zealand's electricity demand.

10. Contact also owns the gas fired New Plymouth power station. This station is in the process of being decommissioned but, given time and money, could still generate up to 100MW if there was need for its output to meet security of supply. However, I believe that this capability is not likely to last for long.
11. Otahuhu B and TCC are both modern 'combined cycle' power stations and discharge significantly less CO₂ per unit of output than typical coal fired thermal power stations. Whilst they can operate down to lower levels than their normal output, these plants are best operated at a relatively constant load.
12. Otahuhu B is particularly well sited to meet the Auckland's power needs as it is located close to the electricity demand. When compared to generation located in far south of the country having generation close to the demand reduces the losses associated with transporting electricity long distances. As the average losses across the national grid network in New Zealand account for approximately 3.7% of the total generation¹, being located within the area of demand makes good sense. 3.7% approximates the energy used in the Dunedin and Queenstown areas. A similar quantity of generation is lost through the distribution system (bringing the total transmission and distribution losses to about that consumed by the Canterbury region).
13. Also sited on the Otahuhu site is the old Otahuhu A open cycle gas turbine power station. This station no longer generates electricity but five of the original six units are now used as synchronous compensators to provide voltage support to the national grid and as such provide valuable service by reducing losses in the system.
14. Section 2 of the Resource Management Act includes geothermal within the definition of renewable electricity generation. Contact has the largest geothermal electricity generation portfolio in New Zealand. Generally the geothermal stations are well suited to steady base load operation as the geothermal wet/steam wells that supply the energy to the stations do not take

¹ From Transpower's Quality Performance Report 07/08.

well to having their output varied to cope with any variation in electricity demand. As a consequence, the geothermal power stations tend to have a relatively high 'capacity factor' – very simply that being the fraction of the time that they operate at the equivalent of full output.

15. Contact also has the Clutha and Roxburgh hydro electricity generating stations located on the Clutha River. Although now constrained to some degree by the combined effect of other generation south of Clyde and electricity transmission limitations north of Clyde, these two stations generate a considerable quantity of electricity – in the 2007/08 year, a reasonably typical year, these stations generated 3504 GWh. That is nearly 9% of New Zealand's total electricity usage.
16. The Clutha River power stations have very limited storage behind their dams (the normal operating range of Lake Dunstan (formed by the Clyde Dam) is one metre and that of Lake Roxburgh 1.85 metres) which means that they can only cycle their output intra day. They largely operate therefore as 'run of the river' hydro generators.
17. Contact owns the Hawea storage dam on the Hawea River, a tributary of the Clutha River upstream of Lake Dunstan. This is Contact's only controlled hydro storage and is typically used to augment inflows to the downstream power stations in late autumn and winter, when natural inflows are lower.
18. Contact also operates and maintains the Whirinaki Power Station, in Hawkes Bay, on the Crown's behalf. This plant is a diesel fired open cycle gas turbine plant which provides reserve generation capacity. Being driven by an aero derivative gas turbine it has good fast start capability and is well suited to providing what we term a 'peaking' role – ie that it generates only in times when there is insufficient electricity being generated elsewhere as demonstrated by the price of electricity in the market. Those times of insufficient generation can be caused by a number of factors that can include dry year, plant (generating or transmission) failure, or other plant outages or a combination of these.

Contact's Renewable Electricity Generation Development Projects

19. Contact has an active policy of supporting renewable generation as a means to reduce greenhouse gas emissions from electricity generation. It believes that a reduction by 40% by 2014 is possible if all electricity generators adopt the same stance. It is leading the way by publicly stating that, given the appropriate policy settings, it will invest up to \$2 billion in renewable generation.
20. Contact's new renewable development projects include two major wind farms and new geothermal generation.
21. The wind farm projects are the Hauauru ma raki and the Waitahora wind farms. The larger of the two of these is the proposed Hauauru ma raki wind farm, located on the west Waikato coast. If approved, it will have an installed capacity of up to 540 MW and, using the expected average wind run, has been estimated to generate an annual power output of around 1,600 GWh. This is slightly more than Contact's Roxburgh hydro power station generated in the 2007/08 year or nearly 15% of Contact's total generation in that year. The Waitahora wind farm site is located south of Dannevirke and the proposed wind farm has a maximum capacity of 177 MW.
22. Contact's consent applications for Waitahora were declined at first instance and Contact has appealed that decision to the Environment Court. The applications for Hauauru ma raki were 'Called In' and the Board of Inquiry has granted Contact an adjournment of a year to refine its applications and obtain further information about potential ecological effects.
23. The proposed new geothermal development projects consist of Contact's Te Mihi project and its two Tauhara projects, both located around Taupo.
24. The resource consents for the Te Mihi project were the first Called In consents to go through the system since the TCC Call In. It is planned that the Te Mihi station will eventually replace the Wairakei power station. As such it will be able to use the steam more efficiently and gain approximately another 60MW of output. The global economic position has delayed progress but Contact is still very positive about Te Mihi and it will proceed as soon as the project economics are favourable.

25. The Tauhara Projects consist of the 23 MW Tauhara binary plant, currently being built, and another geothermal plant of around 200 to 250MW, for which it is planned to file applications for resource consents later this year.
26. Contact has also obtained consents for a 17 MW hydro generation plant proposed to be constructed at the existing Hawea Dam site.
27. In the past few months Contact has announced its desire to further develop the Clutha River hydro and sought public input on four potential generation options. Even in this early consultation phase strong opposition is being experienced to any further development at any point along the Clutha.

Peaking Plant

28. Renewable generation that does not rely upon climatic effects – geothermal and tidal – have a very predictable generation profile. Geothermal tends to operate best at a stable output as varying the output from the wells can be detrimental to the wells long term capability to produce steam. The variation in output that is seen from tidal generators is predictable and other forms of generation can be scheduled to pick up the load during the tidal slack periods.
29. Renewable electricity generators that rely upon climatic effects, that is wind, wave, solar and hydro power stations, have a very variable output. Wind farms tend to have short term variability but are more dependable on a long term basis. Hydro power stations are the opposite with long term variability but are very predictable on a short term basis.
30. To support this short and long term unpredictability of output in the electricity system there is a need for fast starting but reasonably efficient 'peak' loading electricity generating plant. This so called peaker plant must be of low capital cost as getting an economic return is still a requirement and it needs a fast start capability. It is useful if it can also operate over a broad range of outputs with an ability to vary that output reasonably quickly. Hence hydro or open cycle gas turbine plant can be used as good peaking plant. However, a lot of New Zealand's hydro plant is run of river with limited storage associated with it and this provides limited short term peaking capability. Gas turbine plant, however, are very well suited to this role for both short term (provides cover for

wind) and long term (provides cover for hydro) peaking operation.

31. So, whilst this might sound perverse, the inherent characteristics of gas turbine 'peaking' plant play a very important role in allowing the best use to be made of the available renewable generation. The confidence gained from knowing that these power stations are available allows hydro power station operators, when hydro storage is trending low, to run their storage lakes lower. Further, to support wind power stations when the wind energy is not available, the fast start and loading capability of the peaking plant allows it to pick up or shed load mirroring the output from the wind farms, and thus allow the overall electricity generation to continuously match the demand.
32. Contact has consented and is currently constructing a 200 MW Open Cycle Gas Turbine plant at Stratford to provide this kind of generation support to renewable generation developments. It is specifically designed and installed to provide for these short and long term vagaries of the weather. This station will be able to start quickly to cover for short term wind loss or will be able to operate for longer periods to cover for the less frequent but longer term hydro shortages, such as New Zealand experienced over this year's winter.
33. The Stratford Peaker plant is being built on the site of the original Stratford power station. Similarly to the original plant, which was decommissioned in 2001, this is a gas fired open cycle gas turbine, however, it differs in consisting of two units rather than four and with these being of much higher efficiency than the original – 38% vs 24%.

Other Contact Development Options

34. Contact also has land and resource consents for a number of thermal station options. These stations include:
 - Otahuhu C. This is a combined cycle power station similar to the existing Otahuhu B with a capacity of up to 400 MW. Being located near to the demand centre, this power station is an attractive option.
 - Otahuhu A. As noted above the original Otahuhu A power station no longer generates but, being located near New Zealand's major load centre, is an ideal site upon which to locate a peaker unit. Contact holds resource

consents for 120MW of open cycle gas turbine generation to replace the previous Units 1 & 2.

- Taranaki Combined Cycle #2. Contact holds resource consents for a second combined cycle power station of up to 500MW capacity, this one being adjacent to the existing TCC power station.

35. Although the proportion of New Zealand's electricity demand met from thermal (gas-fuelled) generation has increased significantly in recent years, this trend is unlikely to continue. Maui is now rapidly running down and the gas fields developed to replace it have neither the capacity nor flexibility of output which Maui has provided for many years.
36. As a result, there is considerable uncertainty as to whether there will be sufficient gas available to power another combined cycle plant for base load operation, and even more uncertainty as to what the gas price might be into the future. Contact tested the market last year and found no gas supplier was willing to quote for long time gas supply. Overlaid on the uncertainty this creates is the uncertainty regarding the future price of carbon. As a result, new baseload generation dependent on domestic gas is unlikely to be viable unless there are major new discoveries of gas at a sufficiently attractive landed price in the relatively near future.
37. New thermal reliant on imported gas is a possibility and Contact is in a Joint Venture with Genesis investigating this option. The international gas price tends to track the crude oil price as so committing to this option would have significant long term implications for the New Zealand economy, quite apart from the very significant costs of establishing a terminal for landing gas.
38. Lastly, although Contact has not investigated this option itself, it is well known that New Zealand has large reserves of coal and lignite which might be used for electricity generation.
39. The significant point for present purposes is that unless electricity demand can be met from renewable sources, New Zealand will have to look to thermal options and at present, that means imported gas or coal/lignite. Imported gas would be better than coal from a greenhouse gas perspective, but would have the economic implications already noted. Clearly it would be preferable if New

Zealand committed whole-heartedly to a renewable electricity future.

Consenting Experience

40. I have been closely involved with consent applications for both thermal and renewable plants. With certain notable exceptions², it has been my experience that thermal plants are easier to consent than renewable plants. They occupy a smaller footprint. They are less visible. And most attractively from a generator's perspective, they can be located right next to major load centres (and therefore to existing transmission infrastructure).
41. Thus the consent applications for the Otahuhu B combined cycle plant were filed at practically the same time as those for what is now the Tauhara Binary Plant in mid 1996. The Otahuhu B first instance hearing occurred in late 1996, consents were granted and there were two substantive appeals (on greenhouse gas issues). Those appeals were settled and construction of the 380 MW power station started mid 1997. By contrast, Contact's Tauhara applications attracted approximately 1500 submissions which were heard over four weeks in the second half of 1997. Consents were declined and Contact appealed on the basis of a reduced scale proposal. The Environment Court granted consent (after a three week hearing) in an interim decision released in January 2000. Negotiation of conditions took the best part of another 12 months. Construction of the 23 MW plant is now underway, with an estimated commissioning date in late 2010.
42. Contact's Otahuhu C applications followed a similar track to those of Otahuhu B, with a short first instance hearing and only one appeal (again on greenhouse gas issues) which took up less than a week of hearing time. No submitters heard by the Environment Court were raising local issues.
43. Again by contrast, Contact's applications to re-consent Wairakei Power Station and the Clutha Hydro Stations were filed in March 2001. Wairakei attracted just under 200 submissions and the Clutha stations just over 400 submissions. Consents for both were eventually granted in 2007.
44. I appreciate that the National Policy Statement cannot cure delays in the

² Contact's Te Mihi applications which were called in and heard in 2008 are in that category.

consenting process of this kind. I refer to Contact's experience as being indicative of the character of consent processes for renewable generation plants (even those already in existence), showing just how hard it can be to get to the finish line, especially compared with consents for thermal stations.

45. Contact respects the right of interested stakeholders to be heard in relation to consent applications for renewable generation plants. My experience is that such stakeholders will almost invariably say they support renewable generation in principle, certainly in preference to thermal generation.

46. Typically, however, stakeholders will:

- Oppose the type of renewable generation for which consent is sought;
- Oppose the location of the proposed plant; and/ or
- Seek conditions to ensure no adverse effects on themselves ("the wind farm is fine provided I can't see or hear it").

47. This was very much the pattern of opposition at the recent hearing of Contact's Waitahora wind farm applications in Dannevirke.

48. Part 2 of the RMA ensures these concerns are heard and factored into the decision-making process.

49. In my view, the decision-making process also needs to factor in the practical reality that if New Zealand electricity generating companies cannot get resource consents for the renewable electricity generating plant then other sources of electrical energy will need to be sought. This means in practice fossil fuelled generating plant.