Memorandum

To: Hearings Panel
Waitaha hydro scheme proposal
Department of Conservation

From: Tony Baldwin
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Date: 19 December 2016

Purpose

I appeared by Skype at around 4.30pm at the Hearing on 7 December. The Panel agreed at that I could provide a note to accompany my oral submission. Work demands have prevented me from providing it until today.

I have been advised that the Skype connection was not good, which apparently caused every second word or so to be broken.

This memorandum sets out the key points I made at the Hearing. In the interests of ensuring that my oral presentation was brief, I also advised the Panel that I would provide other relevant information in this accompanying note. The matters outlined below are within the scope of my written submission.

Outline

This memorandum is structured as follows

My expertise and perspective

I have worked in the electricity industry since 1991 as a law and economics adviser, and as a project manager of major transactions.

My submission has been prepared from an independent and objective perspective. My analysis and conclusions reflect relevant available facts using standard methods of analysis in the electricity industry. If the proposed Waitaha scheme appeared to be needed from an electricity perspective, or financially viable, in the reasonably foreseeable future, I would not hesitate to say so. If it appeared to satisfy the relevant legal tests, I would not hesitate to say so.

It is not satisfactory to for DOC rely on financial analysis provided by Westpower that has not been critiqued by an expert independent of Westpower. For this role, a person like David Hunt of Concept Consulting in Wellington would be well suited.

Values of the Upper Waitaha catchment

It is agreed by all parties to these proceedings that the Upper Waitaha Catchment, within which the proposed scheme would be located, is an area of outstanding natural values.

DOC Officer Report states at para 4.68 that:

> "the Morgan Gorge would likely meet the test of an outstanding natural feature within an outstanding natural landscape. It is a dramatic, deeply incised feature that has clearly been shaped through regular high energy river flows. It forms the 'gateway' between the upper and lower catchments, and is currently perceived as an unaltered, very highly natural and wild place.

Westpower's consultant, Boffa Miskell, concludes that:[1]

> "...based on the above assessment and within the context and relevant policies of the District and Regional Plan, it is assessed that the Upper Waitaha Catchment contains very high, near pristine levels of naturalness and that the landscape (at both a district and regional scale) be considered *"conspicuous, eminent, especially because of excellence".* This includes the area around the powerhouse site."

Boffa Miskell further summarised the natural values of the Upper Waitaha Catchment as follows:

> "It is considered that they hold high intactness, scientific and distinctiveness values, as recognised in the Westland District Plan to be considered outstanding."[2]

Adverse effects

It is also agreed by all parties that the proposed hydro scheme would cause high adverse local effects.

The proposed scheme would introduce "two nodes of intensified industrialised-style modification occurring within an area retaining very little modification and holding high natural character values."[3] The weir structure would be 4-5 m in height above the river bed and 4 m in width, secured by rock anchors at either end.[4] Other structures would include large tunnel portals, a power station and switchyard.

It is further agreed by the parties that the scheme would also substantially reduce the minimum flow of the river from the top of the Morgan Gorge to the point at which the diverted water is returned to its natural flow 2.6km down river. Among other things, artificial stop-banks would also align the river margin from the outfall to close to where the exit tunnel portal is located.

As Westpower's consultants, Boffa Miskell, assessed[5]:

- In relation to natural character values –

  "With the additional physical elements present of the intake and weir structure, this effect [of local flow reduction] is amplified to a high magnitude of natural character effects at this localised Intake Area";

  "The stop-bank will also artificially modify the river bank. As a result, it is considered that the magnitude of permanent natural character effects at this localised powerhouse area is assessed as being high."

[1] Boffa Miskell report at section 4.2.3 – Appendix 9 of Westpower's Waitaha application
[2] Boffa Miskell,page 72
[3] Boffa Miskell, page 73 and also page 56
[4] Boffa Miskell, page 53
[5] Boffa Miskell, section 5

- In relation to **landscape values** – "the magnitude of permanent landscape effects at this localised intake area (including intake access road) is assessed as being high."

- In relation to **visual amenity values** – "the magnitude of permanent visual effects at this localised intake area is assessed as being high at near distance views."

- During the construction period – "There will be a localised change of landscape character, from semi-remote and semi-natural, to industrial during construction, which would be at least 3 to 4 years."

Acting for Westpower, R Greenaway & Associates reached the following key conclusions:

- The net effect of the scheme on **recreation values** would "remain 'high'... in the Kiwi Flat area and from the top of Morgan Gorge to Douglas Creek. This is due to the introduction of development structures into a predominantly unmodified (besides for recreation) backcountry-remote recreation setting, and flow effects along the abstraction reach."[6]

  "The installation of hydro development structures will be incompatible with the preferred management setting characteristics as described in the DOC CMS."[7]

In relation to **kayaking values**, Whitewater New Zealand (WWNZ) concluded that the adverse effects would be very high, as outlined in the Rankin and Orchard Report (2015) and the Rankin paper (2015)[8].

Statutory regime

With limited exceptions, Part 3B of the Conservation Act 1987 prohibits any non-recreational activity[9] in conservation areas unless authorised by a concession[10].

A concession may be in the form of a lease, licence, permit, or easement[11].

The regime for granting concessions for activities on conservation land is separate and distinct from the statutory regime for granting resource consents. As the Parliamentary Commissioner for the Environment has highlighted:

> "The role of the Minister of Conservation is very distinct from that of decision-makers in the resource consent process and should not be compromised. The core of the Conservation

[6] Greenaway Report, Appendix 19 of Westpower's Waitaha application, at page 8
[7] Greenaway Report at page 64
[8] WWNZ also observes that the Greenaway Report contains several fundamental errors in relation to kayaking values
[9] The range of activities covered is very wide. In the Act, "activity" is defined to include a trade, business, or occupation – s.2(1), Conservation Act 1987
[10] s.17O(2) – exceptions are set out in s.17O(3) and (4).
[11] s.17Q

> Act is the preservation of New Zealand's natural heritage. This is very different from the broader considerations in the RMA"[12]

The objective of the Conservation Act is "to promote the conservation of New Zealand's natural and historic resources". "Conservation" means "the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations".[13]

Unlike the RMA, Part 3B of the Conservation Act does not involve balancing the interests of development against conservation.

The opportunity created by Part 3B for non-recreational activities in conservation areas is relatively limited. This is clearly signalled by the circumstances in which an application must or may be declined.

The Minister **must** decline an application for a concession:

- If it does not comply with, or is inconsistent with, the provisions of the Act or any relevant conservation management strategy or conservation management plan[14];
- If the proposed activity is contrary to the provisions of this Act or the purposes for which the land concerned is held[15]; or
- If the proposed activity could reasonably be undertaken in another location that is outside the conservation area, or in another conservation area where the potential adverse effects would be significantly less[16].

The Minister **may** decline an application for a concession:

- If information is insufficient or inadequate to assess the effects[17];
- If there are no adequate or reasonable methods for remedying, avoiding or mitigating the adverse effects of activity, structure or facility[18]; or
- If the Minister considers that the effects of the activity are such that a review of the strategy or plan is more appropriate, whether or not an application is in accordance with a relevant

[12] Parliamentary Commissioner for the Environment, "Hydroelectricity or Wild Rivers? Climate Change Versus Natural Heritage", May 2012, at page 66 www.pce.parliament.nz/assets/Uploads/Wild-Riversweb.pdf
[13] s.2
[14] s.17T(2)
[15] s.17U(3)
[16] s.17U(4)(a)
[17] s.17U(2)(a)
[18] s.17U(2)(b)

conservation management strategy or conservation management plan.[19] (The Minister may also require the applicant to pay the reasonable costs of such a review[20]).

The Minister is **not required** to grant any concession it if he or she considers that it is **inappropriate** in the circumstances of the particular application having regard to various matters[21].

Further, the Minister must have regard to (among other things) any information received under section 17S [22], which includes:

> "**reasons** for the request and sufficient information **to satisfy the Minister**, in terms of section 17U, **that it is both appropriate** to grant a lease, *profit à prendre*, licence, or easement **and lawful** to grant it" [emphasis added]

Part 3B clearly signals that non-recreational activities in conservation areas should only be allowed if it is **appropriate** (not just lawful) having regard to relevant considerations, including the reasons for the requested concessions.

In summary:

- If an application for a concession under Part 3B is (i) complete, (ii) not required to be declined under one of the three categories referred to above, (iii) there are adequate or reasonable methods for remedying, avoiding or mitigating adverse effects, **and** (iv) there is sufficient information to assess effects, then –

- The Minister weighs (on the one hand) the effects of the proposed activity and other relevant factors (including the reasons for the request) against (on the other) the conservation values of the relevant conservation area, making a decision that gives effect to the statutory purpose of the Conservation Act 1987. The Minister is to be satisfied it is both appropriate and lawful.

Westpower's reasons

In its application of July 2014, Westpower gives six reasons for its requested concessions:

- To meet growth in demand for electricity

- Self-sufficiency in electricity and community ownership

- Security of supply

- Transmission losses

[19] s.17W(3)
[20] s.17W(5)
[21] s.17T(3). The various matters set out in s.17U
[22] s.17U(1)(d)

- Confidence to investors in the West Coast, and

- Reducing carbon emissions

These are the reasons advanced by Westpower that the Department is to evaluate. My submission at **section 12** responds to each of these reasons. Key points, with some supplemental information, is set out below.

Meeting demand growth

As outlined in section 6.4 of my submission, the Amethyst and Waitaha schemes were developed in a similar time-frame. They emerged in a period of relative economic boom on the West Coast – 2001 to 2010. Forecasts of electricity demand growth in that period became almost frenzied. Forecasts ranged from 72% to nearly 350%.

Westpower considered distributed generation to be "the most effective and secure way of meeting growing demand for electricity in the South Island".[23]

In its 2014 application to DOC for the Waitaha scheme, Westpower continued to claim that the scheme is needed to meet growth in electricity demand on the West Coast. At page 118 of its application, Westpower asserts:

> "Peak demand for electricity in the Westpower distribution area has been forecast to grow from 50 MW in 2012 to 70 - 80 MW by 2030, whilst electricity consumption is forecast to grow from 300 GWhs to 400 GWhs per annum by 2030. These growth rate forecasts incorporate possible new mining developments and ongoing growth in dairy farming and milk processing. This will increase the reliance on imported electricity via the national grid in the absence of new generating capacity on the West Coast".

As further set out in section 10 of my submission, the grounds for Westpower's forecast growth of 20 to 30 MW over the next 15 years appear to be extremely weak.

Based on the analysis in my submission, and taking into account Westpower's very poor track record in forecasting (see section 6.6 of my submission), it is reasonable to conclude that Westpower's long term demand forecast of 70 – 80 MW by 2030 in its Waitaha application is more than questionable and provides no basis for medium term investment in new generation capacity.

Put simply:

- Westpower's region has a surplus of electricity supply capacity relative to demand. Even at optimistic growth rates for electricity demand, the Westpower's region has a surplus of supply capacity for some decades.[24]

[23] Westpower's application to the Commerce Commission in relation to the Amethyst hydro proposal, August 2006 , at para 21

- The demand growth Westpower's forecast in its application translates into an annual growth rate of around 3.5% pa for the next 15 years. This is not consistent with Transpower's forecast for the West Coast, which is 1.2% pa or actual demand trends on the West Coast; and

- Peak demand on Westpower's network has declined 19.7% since 2011 (a drop from 55.1MW to 44.3MW peak demand).[25]

With the doubling of capacity on the transmission line in 2011, Westpower has more than enough supply capacity to meet even its highly optimistic growth forecasts looking 20 years out.

Westpower states in its 2016 Asset Management Plan:

> The 2011 transmission upgrade "effectively doubles the transmission capacity, **thus providing security** to the West Coast" [26].

In its 2016 Annual Report states, Westpower concedes that the drivers of growth in electricity demand are weak in their region. Westpower is now citing a Government regional growth study as a key driver of economic growth in the region:

> "Forecasts for demand in the short term do not provide any indication of a significant uplift, however there is work being undertaken on economic development across the region, including the Government sponsored regional growth study. This work will be important for creating an environment for investment in the region which can only help in increasing electricity demand".

In short, there is no case for additional electricity generation to meet growth in electricity demand in Westpower's region.

Self-sufficiency

Westpower also asserts that **existing** demand needs to be met from more local generation. This idea of increasing "self-sufficiency" in electricity for the West Coast is a recurring theme in Westpower's application for the Waitaha schemes – section 12.6 of my submission sets out several examples.

Supporting existing local demand with local generation is also a crux argument in Westpower's letter to DOC of 23 September 2015 at page 9:

> "...the fact remains that demand on the West Coast is still well above the ability of the local generation to supply and the network needs to be supported by energy transmitted into the

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[24] As at 31 March 2014, Westpower's network had an approximately 38 MW surplus in peak capacity. Applying the growth rate in Westpower's 2014 Information Disclosure, it would take about 38 years to use up this surplus) – see section 10 of my submission.

[25] Westpower's Asset Management Plan 2016-26 at page 64

[26] Westpower's Asset Management Plan 2016-2026, section 4.4.2, page 68

> region from elsewhere in the South Island over relatively high loss transmission lines. Clearly, then, the **existing demand** on the West Coast supports the case for more local generation"[27] [emphasis added]

This makes as much sense as arguing that Blenheim or Gisborne or indeed any other part of New Zealand should be self-sufficient in electricity. It is completely contrary to the reason we have a national transmission grid, which is to provide electricity consumers with access to lower cost generation.

As Transpower explains:

> "...demand (load) [is] commonly some distance from the areas of significant generation. Consequently, the transmission network is essential in complementing generation to bring the power to where it is needed" [28]

As the 2009 Ministerial Review elaborates:

> "Transmission is at the heart of the electricity market. It enables electricity to be transmitted over long distances from the regions where it is **cheapest to produce** to where it is required."[29] [emphasis added]

Self-sufficiency may have some parochial appeal, but it is not rational, and it is certainly not a sufficient reason to authorise an activity in an outstanding conservation area that would impose adverse effects.

Community ownership

In its application to DOC of July 2014, Westpower argues that electricity generation needs to be not only local but community-owned. Westpower highlights at page 3 of Appendix 22 its application, that:

> "all other power generation Schemes within the Westpower distribution area are owned either by TrustPower or NZ Energy, both of which are private companies

Westpower continues (also at page 3 of Appendix 22 its application):

> "These companies, by their nature, have a more national focus and there are a number of reasons why other companies will have chosen to withdraw or put their plans for larger Schemes on hold. Westpower differs from these companies in that it has a focus on providing and managing generation and supply for the benefit of the local community".

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[27] Letter dated 23 September 2015, Westpower to DOC, at page 9

[28] Transpower's 2014 Annual Planning Report, section 3.2

[29] 2009 Review, Volume 1 at para 83

> "Whilst the company is run on a commercial basis, as would be anticipated by the community, the revenue is put back into the assets owned and managed on behalf of the community or returned from time to time to consumers in the form of rebates".
>
> "In the early 1990's *[Baldwin note - it was 1998/99, not "the early 1990s"]* the government required the community to divest itself of generation assets which then came under the control of national generators. This essentially disabled the ability for the local community to provide for itself, and plan for the future, in a self-sufficient manner. **Westpower's return to hydro-development** is part of reinvigorating the generating capabilities of the West Coast community, both current and future generations, and **is aimed at regaining a level of local self-sufficiency in generation and supply based on a local and renewable hydro resource**" [emphasis added]

Westpower's reasoning is again 'political' in nature. Westpower may have disagreed strongly with the forced sale of its generation and retail assets in 1998/99 and it may wish to re-build its generation asset base. However, this is not a sufficient reason to authorise adverse effects in a conservation area. Nor is it relevant under Part 3B of the Act.

Westpower's view that alternative schemes are "not West Coast owned and therefore the returns do not remain on the Coast" is another 'political' argument, which is not relevant under Part 3B of the Act.

Reliability

Westpower claims that the scheme is needed to protect against transmission outages and improve reliability. At page 120 of its application, Westpower asserts:

> "The Scheme will provide some protection against situations when no or restricted external transmission capacity into the region is available. For residential consumers, outages as a result of transmission failures are likely to be sufficiently brief to cause only minor inconvenience. However for business customers with high electricity reliance or consumption the costs can be more significant – either in terms of lost production or the requirement to invest in expensive back-up sources of electricity supply."

Since the transmission upgrade in 2011, Westpower describes it as providing "an acceptable level of supply security" and the probability of a full outage on the transmission line as "relatively low".

However, in its 2016 Asset Management Plan, Westpower acknowledges the 2011 transmission upgrade delivered security of supply:

> "The DOB-TEE A line [Dobson to Reefton] effectively doubles the transmission capacity, **thus providing security** to the West Coast."[30] [Emphasis added]

[30] Westpower's Asset Management Plan 2016-2026, section 4.4.2, page 68

Further in Westpower's 2016 Asset Management Plan, at page 104 – referring to the 2011 upgrade in the transmission line feeding Westpower:

> "The new line, termed DOB-TEE A [Dobson to Reefton], was commissioned in late 2011 and provides n-1 security to the Atarau GXP...Prior to the completion of this line, there was insufficient capacity in the Transpower network to supply this load from the south in the event of a fault on the 110 kV circuit from the north. The load was therefore interruptible. This project, along with a related 14 MVAr switched capacitor bank installed at Hokitika, has restored security levels to **a good electricity industry practice standard** for loads of the size and type supplied by Westpower". [Emphasis added]

Referring to the second transmission route feeding Westpower's region, Westpower's 2016 Asset Management Plan states at page 104:

> "The southern part of the Westpower network is fed from a double-circuit 66 kV line from Coleridge, which is supported by a limited capacity 66 kV connection between Dobson and Kumara (see Figure 3.3). This provides an **acceptable level of supply security**, although some load curtailment may be necessary should a common mode fault affect both circuits of the incoming double-circuit line at the same time. **The probability of such a fault occurring is relatively low**."[31] [Emphasis added]

In short, transmission reliability into Westpower meets good electricity industry practice standard.

More generation on the West Coast could increase reliability of supply. However it is far of evident that it is required, or that this would be the most cost-effective means of doing so. Westpower and its customers have a range of alternatives for managing any interruptions in supply in a manner that is more cost-effective than building a $100m embedded hydro scheme.

It is important for DOC to look at the evidence and understand the analysis before DOC could accept an argument from Westpower that the Waitaha scheme is needed for reasons of security and reliability of electricity supply.

If a higher security standard is wanted by Westpower and its customers, a range of much less expensive options are available well ahead of building a 16-20MW hydro station.

Investor confidence

Westpower asserts at page 8 of its 2014 application:

> "The longer term and perhaps less obvious direct benefits from investing in local power generation come from improving economic confidence and the resulting development and infrastructure that may result from this. The Scheme would enhance security of supply in the West Coast region, in turn providing potential investors and developers with the confidence

[31] Westpower's Asset Management Plan 2014-2024, section 3.2, page 66

> to invest in the West Coast region, assured that their energy demands can be met in both the medium and long term... The long term benefits of reduced transmission losses and security of supply underpin these economic benefits."

In its reply to submission, Westpower now says that the economic effects of the proposed scheme are the "starting point" for the rationale[32]. Westpower puts weight on the Brown Copeland report, and the economic stimulus and jobs expected from the scheme[33]. That analysis has not been independently reviewed. It is high level and limited by assumptions.

Further, Part 3B of the Act is not intended to enable regional economic development schemes.

In addition, there is no evidence that confidence to invest in the West Coast region would be limited without the Waitaha scheme. On the contrary, Westpower acknowledges in its 2016 Asset Management Plan:

> "Currently, there is sufficient n-1 transmission capacity available in the transmission network feeding the West Coast, to ensure that major new loads can be supplied on an uninterruptible basis, and so **electricity supply should not be a constraint** to **future economic development**" [Emphasis added][34]

Carbon emissions

Westpower asserts at page 8 of its application to the Minister of Conservation:

> "...there will be a role for new renewable energy sources like the Scheme in meeting electricity demand, even if demand growth is slow. New renewable sources of supply will be required to replace retired thermal capacity"

Westpower also assert at page 9 in its application to the Minister of Conservation that:

> "increasing self-sufficiency on the West Coast will contribute in replacing non-renewable energy (e.g. thermal generation) elsewhere..."

Referring to the Government's economy-wide target for reducing carbon emissions, Westpower states at page 120 of its application to the Minister of Conservation that:

> "If the Scheme results in the avoidance of an equivalent level of generation from gas thermal plants there will be an estimated reduction of 51,120 tonnes of carbon dioxide equivalent greenhouse gases and...this implies an annual saving of $1.3 million in terms of reduced emission units...The equivalent annual saving if coal thermal generation is displaced is estimated at $1.9 million"

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[32] Submissions in Reply for Westpower", 8 December 2016 at para 7

[33] Submissions in Reply for Westpower", 8 December 2016 at paras 7, 21 and 22

[34] Westpower's 2016 Asset Management Plan at page 67

This claim of reducing carbon emissions is given even greater weight by Westpower in its Reply to Submissions[35].

However, it is not at all clear that the Waitaha would reduce carbon emissions from electricity generation in the New Zealand system as claimed be Westpower.

There may be periods when output from the Waitaha scheme would mean that more hydro power from the South Island is sent to the North Island than would otherwise have occurred, resulting in less generation from the thermal stations in the North Island.

However, in a normal year, thermal generation in New Zealand tends to be greatest between mid-March and mid-September (as set out section 11.6 of my submission, this is the period when the Waitaha scheme would, on average, have its lowest 'take' flows). In other words, during the normal period of peak thermal production in a year, the Waitaha would not be well placed to displace thermal generation.

Recent analysis shows that generation projects with low winter output (like the proposed Waitaha hydro scheme and solar) are unlikely to save much carbon – and could in the long-run increase carbon emissions by displacing lower cost new renewable generation that would effectively reduce carbon emissions (like wind or geothermal, which have flatter seasonal output profiles). The authority for this is a report this year by Concept Consulting – "Electric cars, solar panels and batteries – how will they affect New Zealand's greenhouse gas emissions?" - http://www.concept.co.nz/publications.html].

Before DOC comes to a view on Westpower's claims in relation to reducing carbon emissions, it is important that DOC obtain independent expert advice on this matter – in particular, DOC should confer with the author of the report referred above – Simon Coates, Director, Concept Consulting – see http://www.concept.co.nz/simon-coates.html

Summary and conclusion

- **Needed to meet growth in demand:** There is no case for additional electricity generation to meet growth in electricity demand in Westpower's region;

- **Self-sufficiency**: This may have some parochial appeal, but it is not rational, and it is certainly not a sufficient reason to authorise an activity in an outstanding conservation area that would impose adverse effects.

- **Community ownership:** Westpower may have disagreed strongly with the forced sale of its generation and retail assets in 1998/99 and it may wish to re-build its generation asset base. However, this is not a sufficient reason to authorise adverse effects in a conservation area. Nor is it relevant under Part 3B of the Act. Further, Westpower's view that alternative schemes are

[35] "Reply to Submissions", 8 December 2016 at para 12 – 16

"not West Coast owned and therefore the returns do not remain on the Coast" is another 'political' argument, which is not relevant under Part 3B of the Act.

- **Reliability**: Westpower already has security of supply from the transmission grid that (in Westpower's words) meets a "good electricity industry practice standard". If a higher security standard is wanted by Westpower and its customers, a range of much less expensive options are available well ahead of building a 16-20MW hydro station.

- **Investor confidence:** There is no evidence that confidence to invest in the West Coast region would be limited without the Waitaha scheme. On the contrary, Westpower acknowledges in its 2016 Asset Management Plan that "electricity supply should **not be a constraint to future economic development**" [Emphasis added][36] Further, Part 3B of the Act is not intended to enable regional economic development schemes.

- **Lower carbon emissions:** The Waitaha scheme could increase carbon emissions by displacing lower cost new renewable generation that would more effectively reduce carbon emissions (refer to Simon Coates, Director, Concept Consulting, for more information on the effects of generation with low winter output).

In short, Westpower's reasons for the proposed concession are not supported by the evidence and do not provide sufficient reason to conclude that it would be appropriate under Part 3B of the Act to authorise an activity in a conservation area that would impose adverse effects.

In reality, there is no compelling case for the Waitaha scheme from an electricity perspective – not in terms of meeting future, not in terms of meeting existing demand, not in terms of lifting reliability to a good industry standard, and not terms of in reducing carbon emissions.

In its Reply to Submissions, Westpower put its case for the scheme more plainly:

> "If we **can** create a surplus of electricity generation on the West Coast...then we **should**" [Westpower's emphasis][37]

"If we can, we should" is not a sufficient reason to make it appropriate to impose adverse effects on a pristine conservation area.

Underlying reason for scheme

Westpower's underlying reason for the Waitaha scheme is that Westpower wants to grow as a business. As set out in Westpower's Statement of Corporate Intent 2015-2017:

[36] Westpower's 2016 Asset Management Plan at page 67
[37] "Submissions in Reply for Westpower", 8 December 2016 at para 20

> "Westpower's Directors have established a strategic direction which includes growing the wider business, while ensuring that the core business of electricity distribution is sustained."[38]

Growth prospects in its core business of electricity distribution are very weak. So it is seeking to grow in non-core businesses.

As noted in section 3.4 of my submission, following the relaxation in 2001 and 2004 of statutory restrictions on electricity distribution businesses owning (or being involved with) electricity generation and retailing,[39] Westpower decided to "re-enter electricity generation" on the grounds that it had considerable management expertise and experience in hydro generation.[40]

The desire to grow as a business is understandable, but it is not a sufficient reason to justify imposing adverse effects on a pristine conservation area for a scheme that is not required from an electricity perspective and not likely to be economic in the reasonably foreseeable future.

Financial viability

Relevance

DOC Officer's Report considers financial viability only in relation to the risk of the Crown ending up with the cost of running the scheme or removing it. At para 2.21 of the Officer's Report states:

> "The Department considers that Westpower has used appropriate methodology and rigor to demonstrate that the Waitaha Hydro project is of a low risk financially to the Department in terms of the Department's ending up with the cost of running the scheme, or removing it and undertaking possible site remediation by default. The Department also considers that, in the unlikely scenario that Westpower became financially unviable, there is a high likelihood that there would be a purchaser for the asset".

However, the relevance of financial viability in this case is not focused mainly the risk of business failure. Rather, it relates to the "appropriateness" test referred to above – that is, whether it would be "appropriate" to authorise an activity with high adverse local effects if the activity is not likely to be financially viable in the reasonably foreseeable future (or needed from an electricity security and reliability perspective).

This was part of the Minister's consideration in declining the mono-rail application for a monorail in Fiordland in 2014, which was not confined simply to the risk of the Crown ending up with the asset and the cost of remediation. As the Minister's letter to RHL of 24 May 2014 at para 45 states:

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[38] Westpower's Statement of Corporate Intent 2015-2017:

[39] Restrictions on electricity distribution businesses owning (or being involved with) electricity generation and retailing were further substantially lessened by legislative changes in 2008 and 2010. Restrictions were lowered by 2001, 2004 and 2008 amendments to the Electricity Industry Reform Act 1998, and the Electricity Industry Act 2010

[40] Westpower's application to the Commerce Commission in relation to the Amethyst hydro proposal, August 2006, at para 20

> "a bond can cover the cost of removing the structure, and it can cover the costs of restoring the landscape to some extent but **it cannot replace the existing forest or the species** that will have been disturbed".

Drivers of financial viability

The financial viability of new hydro developments is influenced by a range of factors, but three are particularly material:

- Cost of building
- Cost of capital
- Future electricity prices.[41]

If future electricity prices are assumed to be high enough, and/or the cost of building and capital are assumed to be low enough, any hydro scheme can be made to appear financially viable.

However, none of Westpower's assumptions are disclosed in any of the information provided by or on behalf of Westpower.

Given that Westpower is owned by community trust, and that the proposed scheme would be embedded within its network, there is no particularly compelling reason why Westpower should not disclose these key assumptions, particularly future electricity price assumptions.

Westpower is not a private or listed company competing against other developers. Even if it were a private or listed company, key investors or market analysts would expect to given markers on whether the full cost of power from the scheme is expected to be less than the expected wholesale market price of the electricity.

Westpower's claims on financial viability

Westpower baldly asserts that the Waitaha scheme is financially feasible under a range of scenarios, in both the **short** and **long** term and with a reasonable degree of certainty[42].

In an even more 'bullish' view, Westpower asserts:

> "Waitaha should be constructed and commissioned prior to 2019 to fill a growing need for new generation, and with a four-year construction period, this would mean that work should ideally begin immediately".

[41] A fourth and relative key driver is how well generation output matches seasonal changes in wholesale electricity prices
[42] Letter of September 2015 from Westpower to DOC, bottom of page 2 of 11

This is only possible if Westpower assumes unrealistically high wholesale electricity prices that do not reflect current market expectations. An example appears in the report of September 2015 by Hugh Ammunsden for Westpower at page 24 in which Mr Ammundsen asserts that:

> "...if the primary projections or assumptions cited in the Baldwin Report are used to create a simplified DCF model, the resulting net present value is in fact positive to a degree that would justify investment."

First, as noted below, he did not use my price assumptions. Second, if he had, it is unlikely that the Waitaha scheme would be viable under his DCF model.

Mr Ammundsen uses a wholesale electricity price at 2020 of $**100**/MWh. By contrast, my viability assessment used a price at 2020 of around $**75**/MWh. The difference is extremely material.

I am not aware of any serious players in the electricity generation market who expect wholesale prices to rise to $**100**/MWh by 2020.

The report of September 2015 by Dave Boyle for Westpower mentioned that:

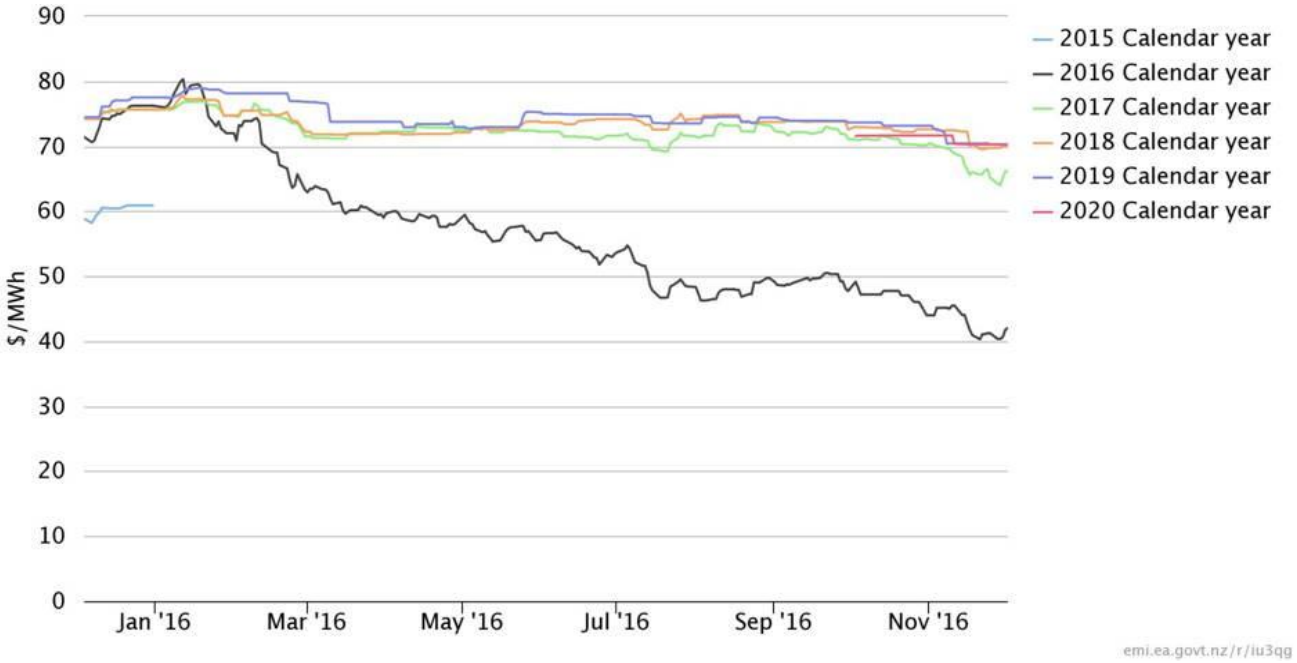
> "Since the 2015 EDGSs were developed there have been a substantial number of changes to both the demand and generation forecasts, and these changes will likely **bring forward generation** plans and also result in an **increase in the wholesale electricity price**" [emphasis added].

Mr Boyle referred particularly to the then proposed decommissioning of Huntly thermal generation units. Since Mr Boyle's report, Genesis Energy has reversed its decision to decommission the Huntly units.

The forward price of electricity has not increased. Nor is it clear that new generation proposals have been brought forward.

Current market price expectations

As at 4 December 2016, the **actual** price for wholesale electricity in 2018, 2019 and 2020 was close to $**70**/MWh – as shown in the chart below.



$**70**/MWh is a very long way below the $**100**/MWh suggested by Mr Ammundsen for Westpower.

The other best practice method of gauging real market expectations for future wholesale electricity prices is to look at the prices assumed by market analysts in recommending share values for listed electricity companies.

The most relevant point of reference is Meridian Energy as it is a South Island generator relying on hydrology inflows with a very similar pattern to the Waitaha.

First NZ Capital ('FNZC') has one of the better financial and electricity system models among the market analysts. As August 2016, FNZC's assumed a generation-weighted wholesale price for Meridian of $**75**/MWh at 2020, climbing toward $**85**/MWh in 2023.

These market expectations of future electricity prices make a nonsense of Westpower's claim that the Waitaha scheme is likely to be viable in 2019.

Based on current market information, it seems unlikely that the Waitaha scheme would become economic in the reasonably foreseeable future.

Whether it becomes viable beyond that is not clear. It is too far into the future to make a reasonably well informed judgement.

Why prices rise and next cheapest options

The wholesale electricity prices trends toward the cost of power from the next cheapest new source of supply

Wholesale electricity prices therefore rise on a structural (rather than seasonal) basis if demand increases to a level that requires extra generation and the full cost of power from the new generation is higher than existing wholesale prices.

There is an accepted industry guide as to when a new generation scheme is likely to become economic – it is when the price it receives over time for its electricity is equal to or greater than the full cost of producing it.

Over recent years there has been a significant surplus of generation capacity in the New Zealand electricity system, and demand growth has been relatively limited. However, there are signs that growth in electricity demand is returning to parts of the economy with demand growth averaging around 1.4% in the past two years.

However it is not at all clear when the next increment of new generation might become economic.

Current market consensus suggests that the next cheapest sources of additional electricity generation are:

- Incremental upgrades to existing geothermal plant (that is, blocks of new geothermal generation rather than a single large new plant); and

- New wind turbines, which can also be added in discrete blocks.

Some market commentators believe wind could be as cheap as $78-$80/MWh. Meridian Energy recently stated[43] that:

> "new generation may be required by somewhere between 2019 and 2023. We believe this requirement will be met by incremental geothermal upgrades to existing plant, new wind farms and potentially some new gas peaking plant".

New Zealand still has a very large quantity of new generation that has already been consented (not counting those options that have been abandoned), which is waiting in the wings to see if demand rises to a level that would make it economic to build.

[43] In its 2016 Annual Report

For the Waitaha scheme to compete against low cost wind and geothermal, it would need to have (among other things) an impressively low capital cost. How this would be achieved is not apparent. Westpower has not disclosed any of its key assumptions.

It is also worth noting that the Waitaha's hydrology follows the same seasonal pattern as the Waitaki system – inflows are low when electricity prices are high over the winter period. Unlike the Waitaki system, the Waitaha scheme could not store water to use it when it has higher value. These two factors make the Waitaha a **relatively poor option** for renewable generation.

Other factors that militate against the financial viability of the scheme in the reasonable foreseeable future include the proposed transmission pricing methodology, which is likely to make the economics of the Waitaha scheme even more challenging in the foreseeable future.

Crown granting Westpower an 'option'

For Westpower, Mr Ammundsen emphasises in his report of September 2015 at pages 21 and 22 that:

> "A project may be viewed as a **"nest" of options**, at each stage of which the project might either fail or else the firm might choose not to proceed...[emphasis added]
>
> "... Learning options capitalise on timing advantages – a firm does not have to commit major capital until it is satisfied that conditions are favourable (and will not commit if it is not so satisfied).
>
> "In essence, real options provide a cogent economic framework for assessing the obvious: a firm should not invest until conditions favour a project, but unless it has completed any necessary preconditions (including consents) it will not have the choice to make larger financial commitment decisions".

In reality, Westpower is seeking concessions now to give it the **option** to build the Waitaha scheme sometime in the future if and when it may become economic.

However, granting concessions now for an activity with high adverse local effects when the activity is not needed for many years or likely to be economic in the reasonably foreseeable future, and when the other reasons given by Westpower for the scheme are not supported by the evidence or not relevant under Part 3B, would not be consistent with the Minister's role and powers under Part 3B of the Act.

Westpower should re-apply if and when it has reasons that are sufficient to make the activity and its adverse effects appropriate.

At that time, the Minister would have to consider all the relevant factors, including whether the activity could reasonably be undertaken at many locations outside the conservation area in question.

In the meantime, if electricity demand in New Zealand should grow to a level that requires new generation, it is likely that a range of lower cost options already fully consented will be built (particularly geothermal) in locations that are outside conservation areas.

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