Attachment 4

Significant regional or national benefits

1. The CPH is a large project which would give rise to the very significant regional and national benefits, as described below:

National benefits:

a. Physical improvements in electricity security of supply, especially during dry hydro sequences and intermittent solar and wind generation, which result from the large store of potential energy in the raised Lake Onslow, which will more than double New Zealand's hydroelectric storage.

b. Physical reductions in greenhouse gas emissions following the retirement of Huntly, New Zealand's current dry hydro sequence insurance and New Zealand's largest carbon dioxide greenhouse gas emitter.

c. Market improvements in the New Zealand electricity market, which will reduce risks for new investors in intermittent generation. Improvements in hedge or firming contracts in both dry and normal years will reduce their risks and lower their costs of entry. The long run marginal cost for new entrants will drop.

d. Electricity prices will drop and be less volatile. Residential, commercial and industrial consumers of electricity will all benefit, in contrast to current projections on the ASX futures market for electricity which project further increases.

e. The MBIE — NZ Battery Project: Indicative Business Case and market modelling (OptGen/SDDP) (2023–2024) predicted wholesale prices will be lower and less volatile with Onslow; worked examples translate into annual consumer bill savings by 2050 of the order of NZ$230–483 million/year for the South Island and ~NZ$440 million/year for the North Island (scenario-dependent). See below for why the Applicant believes these savings are now understated.

f. The reduced risk and improved economics of new generation will unleash further investment in electricity generation.

g. More secure electricity supplies at less volatile and more competitive prices will enable increased investment the economy generally, especially in new ventures for which electricity is a significant cost centre.

h. The transition to non-fossil fuel industrial heat will cost less and speed up. This will benefit primary industries which use large quantities of energy including for dairy, livestock, timber, fish and vegetable processing. This in turn will encourage value-added manufacturing c.f. the export of less transformed primary products.

i. The electrification of transport will cost less and speed up. The economic benefits will include current account improvements from reductions in the importation of fossil fuels for transport.

j. The need to import LNG or other forms of gas for electricity will be avoided, or ended earlier, along with the risk of linking New Zealand energy prices in electricity and gas markets to international prices.

Regional benefits

k. The multi-billion dollar construction phase will have regionally significant and positive effects on employment and GDP during construction.

l. The upgrading of infrastructure (including social infrastructure) to enable the project will have long term benefits, as occurred with earlier large electricity projects in the region.

m. The proposed environmental offsets / compensation for unavoidable environmental effects will have long term regional benefits by bringing an overall conservation gain and the long-term protection of natural values that would not occur without the Project.

2. The nationally significant attributes are described in more detail in the following narrative.

Dry year resilience

3. When there is a shortage of electricity due to an extended low hydro inflow sequence and hydro reservoirs are low, the energy potential stored in the proposed reservoir can be used as a massive energy resource to augment electricity generation.

4. The raised Onslow lake will hold enough water to generate at 1000MW for 6 months and produce up to 4000GWh. It is equivalent to the worst energy shortfall the NZ hydro system has experience over the last 89 years of recordings.

5. In terms of location, extreme low hydro inflow sequences resulting in low hydro storage arise mainly in the South Island's Waiau, Clutha and Waitaki hydro catchments. The Onslow project is ideally physically located in the power system to compensate for that reduced electricity generation.

6. When the Huntly's coal fired Rankin generators are retired circa 2035 (they will be 50 years old by then) NZ will require new energy reserves to compensate for a dry hydro sequence.

Voltage Support and spinning reserve

7. As an ancillary benefit, Clutha Pumped Hydro would provide voltage and spinning reserve support to the national grid and this would enable the overall power system to operate more efficiently and at lower cost.

Firming intermittent renewables

8. Clutha Pumped Hydro would help to firm or hedge against intermittency in wind and solar generation. This is especially important for the growing number and large scale of these installations in the South Island.

9. Wind and solar outputs can change rapidly, when the wind drops or clouds cover the sun. Thermal plants like Huntly cannot start or ramp fast enough to compensate for such rapid reductions. (The Huntly plant takes 12 hours to start while the CPH can start in seconds and is continuously variable without loss of efficiency).

Increased investment in intermittent renewables and lower emissions

10. Clutha Pumped Hydro would facilitate a significant uplift in new renewable generation investment and an overall reduction in systems-wide greenhouse gas emissions, because the cost to new entrants of firming electricity supply, when their intermittent generation is constrained through low wind or no sun, will be lower.

11. The flexible electricity products from Clutha Pumped Hydro will enable new investors and new investments in intermittent renewable generation improved access to a predictable and affordable hedge against their intermittency.

12. This will significantly reduce risks for and increase the confidence of independent renewable generation investors to invest in New Zealand projects.

13. More independent entry of generation into New Zealand will improve competition in the electricity market and will significantly lower wholesale electricity prices across the whole country. It will also mobilise more New Zealand and overseas capital investment into new generation and lower the average cost of capital.

Lower carbon costs to the economy

14. With future national energy supplies increasingly coming from renewable electricity, displacing fossil energy, New Zealand's national greenhouse gas emissions will reduce, lowering New Zealand's exposure to future carbon costs.

Lower electricity prices

15. CPH will drive reductions in wholesale electricity prices, which flow though to retail prices. The MBIE — NZ Battery Project: Indicative Business Case and market modelling (OptGen/SDDP) (2023–2024) predicted wholesale prices will be lower and less volatile with Onslow; worked examples translate into annual consumer bill savings by 2050 on the order of NZ$230–483 million/year for the South Island and ~NZ$440 million/year for the North Island (scenario-dependent). These figures pre-date the worsening gas shortage, the actual rise in prices over the last two years, and the increases in the ASX futures market for electricity, and so in the Applicant's view understate consumer savings. If LNG is imported to moderate onshore gas shortfalls, these figures understate the benefits of CPH by up to a factor of 2.

16. Under current electricity market structures and rules, there is limited incentive for the current major gentailers to invest in projects that reduce wholesale prices (this can reduce their value relative to higher prices without investment). It is especially hard for them to justify or make investments to reduce dry year risks.

17. The futures market for New Zealand electricity, run by the ASX, shows that under the status quo NZ prices are expected to continue to rise.

18. When Huntly retires circa 2035, or if it were to fail before 2035 without replacement dry year cover, this would place a further upward trend on wholesale prices, at significant cost to consumers, including businesses and exports.

Reduced risk of outages

19. It is readily apparent that the current market has not replaced Huntly. A solution is needed to insure NZ against a deep black out in a dry sequence. For example, one dry hydro inflow sequence event which left the NZ economy 4000GwH short of electricity could cost the Country many billions in GDP, even assuming substitute economic activity. The 1992 and 2001 dry sequences provide indelible evidence of such costs. Further, the reputational damage and detrimental effect on New Zealand as a destination for foreign direct investment would be significant.

20. The risks are not fanciful – witness the harm wrought by the five-week long central Auckland power outage from19 February 1998 to 27 March 1998.

21. The seriousness of current firming-market and dry year constraints increases as our economy becomes more reliant on electricity as fossil fuels are phased out and more wind and solar generation is deployed to meet economic growth.

22. In contrast, CPH would both insure NZ against dry hydro inflow sequences, plus incentivise greater independent investor renewable electricity investment which will help peg wholesale prices long term to the lowest cost of entry.

23. In electricity market terms it will both remove the dry year risk premium and the intermittency risk premium currently being factored into wholesale prices and paid for by consumers.

Dry year price spikes moderated

24. In addition to the price benefits in normal hydrological years, dry year outcomes will be much improved. The price spikes in dry years that have in the past driven down electricity consumption and closed some industries would be substantially moderated, increasing New Zealand's GDP and GNP and providing much more reliable and predictable future electricity prices.

25. It is recognised that this project could itself exercise market power, especially in a dry year. We expect the Electricity Authority which sets the rules for the NZ electricity market would need to update its rules and would do so before this project is completed.

26. These issues are also discussed in independent expert economic analysis of the national significance of this project from Peter Wilson dated 7 November 2025 and included in section 2.6 of the Application Form.

27. The improvements to electricity energy security, markets and prices will also facilitate the electrification of other sectors of the economy, such as transport and industrial process heat. This is both an economic benefit and another greenhouse gas benefit of the project.

Avoids renewable overbuild and fossil fuel imports and associated price risks

28. Clutha Pumped Hydro would also obviate the need for the renewables overbuild which some propose in order to cover dry sequence risk. We would note there is no market incentive to overbuild. It would also be more costly than CPH and could not be relied upon with the certainty needed to produce 4000 GWh at the time a dry sequence exists (dry sequences do not always occur at the same time of the year).

29. CPH would also obviate the need to import LNG for electricity generation, and by doing so remove the risk of linking New Zealand electricity and gas prices to higher, and more volatile international prices.

Unique opportunity born of rare features

30. On one level CPH is a very simple scheme physically: it uses water from New Zealand's largest river, stores it in a lake, and generates electricity in the same way we already generate 58% of our electricity.

31. What makes CPH unique is two geographic features of the Onslow Basin:

    a. Firstly, the Onslow Basin has a remarkable capacity for water storage with a single dam.

    b. Secondly, the Onslow Basin is also in close proximity to a major river with a high vertical distance between. This high head allows a great deal of energy to be produced per unit of water.

Efficiency of use of resource and long life

32. The round-trip efficiency (RTE) for CPH is estimated at approximately 75%. The efficiency of a conventional hydro generator is generally above 90%. The difference is the slightly lower efficiency of combined generator/ pumps and water evaporation.

33. By way of another contrast, the conversion efficiency of Huntly running on coal is 35% at best, lower if biomass is included. The normal life of a conventional fossil fired station is approximately 40 years.

34. CPH will likely last 100 years or more, be as efficient at the end of its life as it is at the beginning and cost much less for NZ.

35. While having a lower RTE than a grid-scale battery, CPH is greatly superior. A lithium ion battery big enough to store 4500 GWh would be the equivalent of 300 million Tesla

Powerwalls and cost over $2 trillion. However, lithium ion batteries cannot hold their storage for years so even if such batteries were to exist it would not provide dry sequence insurance. While the household economics of storing home solar are different to grid scale storage (because they avoid retail tariffs), they are still costly.

36. CPH also has the benefit of avoiding the environmental costs caused by lithium both as mined and as disposed of or recycled.

Predictability

37. Pumped storage projects are common overseas and have highly predictable performance parameters. There are many under development in Australia as that country transitions from coal generation to wind and solar generation.

38. However, the combination of a large river flow and a high head from a relatively small reservoir is not common globally; Lake Onslow has no peer in New Zealand or Australia. Most other pumped hydro schemes can only run in generate mode for a few hours to a few days before requiring refilling.

39. In our view CPH can credibly and affordably solve New Zealand's dry year problem, especially when the Huntly coal fired station is retired or fails.

40. At the same time it will solve the growing intermittency problem from wind and solar and so enable more independent investors to invest in NZ while bringing electricity prices down.

41. Other experienced senior industry participants support all or significant parts of the above, as the two following letters from Tom Campbell and Gary Holden show.

ATTATCHMENTS

- ***Letter from Tom Campbell***
- ***Letter from Gary Holden***