28 March 2021

Dr Roderick Carr
Chair, Climate Change Commission
Wellington

Dear Rod

Climate Change Commission 2021 Consultation Draft

Congratulations on the comprehensive analysis and recommendations by the Climate Change Commission. The draft advice sets out an ambitious but achievable path to meet New Zealand's climate change targets and global commitments.

Getting there will be challenging on many fronts, but Contact Energy Is up for the challenge. Contact is focussed on decarbonising New Zealand through supporting industry to transition to low carbon fuels like electricity, investment in significant new renewable generation and the review and ultimate retirement of thermal generation. In February this year, we committed to build the new $580m Tauhara geothermal station, near Taupō, and we continue to explore other renewable generation including wind and further expansion of geothermal. Contact has also committed to a strategic review of our thermal generation.

We, and our subsidiary Simply Energy, are working with customers and developing capabilities to reduce emissions through the electrification of process heat, demand management to support the grid at peak times, and battery storage. The consequence of the last two is a reduced requirement for carbon-intensive, gas-fired peaking generation.

Contact welcomes the Commission's science-based approach to the task ahead for New Zealand. Contact was the first electricity company in New Zealand to adopt Science-based Target Initiatives (SBTI) to independently measure our progress to decarbonise. A science-based approach by government has stood New Zealand in good stead as the world battles Covid-19, and similarly should guide mitigation actions and government policy on climate change.

Setting clear and enduring policy will ensure businesses such as Contact have the confidence and certainty to accelerate decarbonisation investment. Given the scale of the challenge for New Zealand, recommendations should focus on a market-led, incentives-based approach. Government policy should encourage the lowest cost approach to meet decarbonisation goals, while managing transition risks to our communities, particularly those at high risk, or removing roadblocks to decarbonisation across the economy.

Our submission sets out further details of Contact's decarbonisation focus, how we will contribute to achieving the goal, and feedback on the Commission's draft recommendations. Working together, we look forward providing leadership to addressing this climate challenge, and a better future for all New Zealanders.

Yours sincerely

Mike Fuge
Chief Executive Officer

He Pou a Rangi
Climate Change Commission

2021 Draft Advice for Consultation

Contact Submission

March 2021

Executive Summary

1. Contact Energy supports the direction the Commission is taking to ensure that New Zealand can meet its climate change targets. Our focus is to go further and faster to support New Zealand's decarbonisation goals. Contact is taking action now.

Contact's Decarbonisation Commitments

Decarbonising Electricity Generation

2. Today, 83% of Contact's electricity is renewable generation. Our goal is to achieve 95% by 2024, and ultimately be 100% renewable. To achieve this, we are committed to:

- **Build a 152MW geothermal power station at Tauhara** – Contact has confirmed its $580m investment will be completed and on-stream in mid-2023. Tauhara is New Zealand's leading baseload, low-carbon, renewable electricity investment. Replacing fossil fuel generation with geothermal generation from Tauhara will reduce New Zealand's emissions by 450,000 tCO_2e each year. This is the equivalent of removing at least 200,000 petrol cars off the road, powering one million EVs or 175,000 homes.

- **Further renewable generation investment** – Contact is actively working on new geothermal, hydro and wind opportunities. This includes the Wairakei geothermal plant replacement and potential expansion by a further 70MW, hydro turbine refurbishment programme to increase output, and an exclusive partnership with wind generation experts Roaring Forties to develop further wind projects across New Zealand.

- **Investment to reduce the need for thermal generation during peak demand** – Contact is actively exploring investments that will reduce peak demand. This includes the potential investment in a 50MW North Island battery that will leverage renewable generation during periods of low demand intra-day. Transmission policy settings require urgent change to accelerate such investments.

- **A Thermal Review** – Contact is undertaking a strategic review of its remaining thermal generation portfolio. While we all want rapid removal of coal and diesel from the electricity system, we agree with the Commission that gas will continue to have a limited place in generation in the medium term. Our focus is to ensure the orderly and rapid exit of fossil fuels from electricity generation.

- **Science-based Target Initiative (SBTI)** – Contact was the first generator in New Zealand to introduce SBTI to measure and independently validate reductions. We have agreed to extend our SBTI commitment to reduce our Scope 1 and 2 emissions by 45% by 2026.

3. Electricity generation, including fugitive emissions from geothermal, represents 5% of New Zealand's total gross emissions (4 million t CO_2e in total), with the Commission identifying that a reduction of ~56% will be required to meet total targets. This represents a target of approximately 93% renewable generation by 2030. Based on our own commitment, Contact is on target to deliver its contribution by 2024.

Supporting New Zealand to decarbonise:

4. As the Commission identifies, renewable electricity will play a significant role in decarbonising process heat, transportation and industrial processes. The opportunities we are focussed on include:

   - **Electrification of Process Heat** – Contact is working with commercial customers to electrify process heat, and we endorse the Commission's support for further subsidies to accelerate such electrification. Contact worked with Open Country Dairy to provide New Zealand's largest electrically powered 13MW boiler at Awarua, Southland.

   - **Hydrogen** – Hydrogen and hydrogen-based chemicals will support fuel transition and carbon abatement strategies in selected global energy markets while providing a platform to decarbonise New Zealand's own transport and industrial sectors. Contact is co-funding a $2 million feasibility study to investigate the potential of a large scale, renewable hydrogen or hydrogen-based chemical production facility in the lower South Island. The findings of that study are expected in the middle of 2021.

   - **Simply Energy** – Contact owns Simply Energy, that delivers innovative energy solutions for generators, distributors, retailers and commercial customers. Simply helps its customers reduce emissions and support grid stability through demand flexibility.

Commission Draft Report

5. Contact supports the direction of the Commission's draft report which takes a rigorous science-based approach to assess New Zealand's current carbon trajectory and the recommended budgets for the coming three periods out to 2035.

6. Forecasting out to 2050 inherently requires many significant and bold assumptions. The modelling directionally shows the size of the challenge and scale of actions required. Contact is confident that the electricity sector, with initiatives such as those outlined above, will deliver, and hopefully exceed, the modelled outcomes.

7. New Zealand must adopt the lowest cost mitigation opportunities to remain internationally competitive and minimise the impact to consumers, enterprises and businesses. Contact applauds the Commission's analysis and sensible recommendations to achieve this balance.

8. There are five recommendations that allow us to accelerate our investment in decarbonisation:

   - **95% renewable generation by 2035** – Contact ultimately supports a fully renewable electricity generation system and is investing to achieve that. The Commission correctly identifies the very high abatement cost of $1,200 per tCO2e required to achieve 100% renewable generation by 2030, consistent with previous expert analysis by the ICCC and the Productivity Commission. Contact supports the draft report's view that there are significantly cheaper options to achieve greater decarbonisation earlier.

   - **New Zealand Battery Project** - Contact agrees with the Commission that the government should approach the pumped hydro project being considered at Lake Onslow cautiously in the face of lower cost, lower risk and less intrusive alternatives, and take a balanced

view of environmental sustainability overall including challenges with water. Contact is engaged in this stage of the consultation and we hope the investigation work will have a broad scope and wide public consultation to ensure a wide range of options are canvassed and considered.

We do have concerns that it is a high-risk solution to reduce a relatively small quantity of carbon emissions when compared with the gains that can come from other sectors like industry and transport. Separately we are directly exploring commercial alternatives that would address dry year risk, including use of interruptible hydrogen production, smaller battery investments and increasing demand flexibility.

- **Gas will have a declining but important ongoing role** – While Contact is investing in renewable energy, gas will continue to have a role in the medium term in firming renewable wind and solar.

- **Emissions Trading Scheme –** The ETS with the right settings is an effective market-based mechanism to price carbon and create incentives to decarbonise across New Zealand. It will encourage the substitution of the highest cost thermal plant to renewable generation to occur first, resulting in the lowest cost approach to removing carbon. Contact agrees that an accelerated price path for NZUs, and reductions to industrial allocations, is necessary to meet the carbon budgets.

  Increasing unit prices will accelerate investment in renewable energy, and the transition of process heat to biomass and electrification. Ultimately this will reduce energy prices, as higher cost thermal generation is displaced by lower cost renewable generation. In the medium term however, higher unit prices will flow through to energy prices before the migration to lower cost, fully renewable, generation has occurred. Contact also recommends that ETS funds are ring-fenced and specifically used for further decarbonisation initiatives including targeted incentives for transport.

- **Geothermal has a strong future –** New Zealand is a world leader in geothermal, and further development opportunities exist to increase baseload geothermal generation. We believe the Commission's analysis underestimates the generation contribution that geothermal can make. We expect geothermal generation will contribute 12TWh by 2030, rather than 10TWh estimated by the Commission. Contact are actively investigating options for carbon reinjection and alternative uses of carbon dioxide from geothermal generation to ensure geothermal emissions are reduced in line with our emissions reduction targets.

9. Decarbonisation will require significant investment. In the electricity generation sector, multi-billion dollar investment will be required by 2030 alone. Providing investors with certainty is critical. Given the long-term sunk investment, changes in government policy over time, ad hoc policy responses or ongoing uncertainty will have a significant dampening effect. We strongly agree with the Commission's recommendation that political consensus be achieved across the political spectrum so that the private sector can invest with long-term confidence.

10. While the Paris agreement creates domestic obligations, decarbonisation is a global imperative. The Commission's draft modelling readily assumes the exit of some Energy Intensive Trade Exposed industries to meet New Zealand's energy targets. This creates two risks – that carbon leakage increases total global emissions where production becomes more emissions-intensive, and the adverse impact on the New Zealand economy from industrial

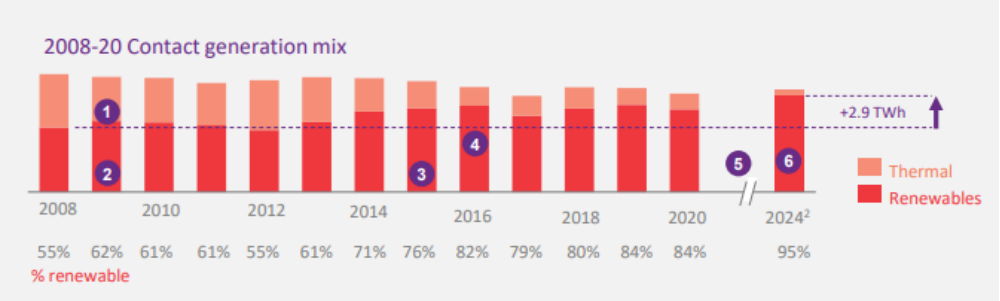
exit. Contact recommends further analysis of the risks of carbon leakage and its impact on the economy.

11. We recognise the likely impact that structural changes to the economy will have on New Zealanders, and the risk that vulnerable communities are disproportionately impacted. We are focussed on supporting decarbonisation and a long-term electricity system that is affordable, reliable and sustainable in the long term. We will continue to focus to ensure that our investment, innovation and targeted initiatives ensure that all New Zealanders share in the benefits of transition.

Contact's Decarbonisation Commitment

12. Contact's strategy is to lead decarbonisation of New Zealand. To achieve that, Contact will decarbonise its electricity generation, invest in innovation to reduce the electricity system's reliance on fossil fuels, and work with our customers to help them decarbonise.

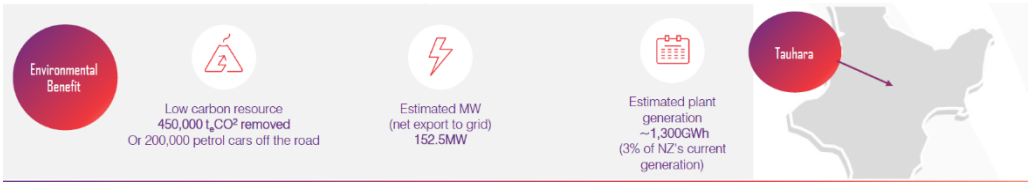
13. Contact has continued to decarbonise its generation portfolio. In the 12 months to 30 June 2020, Contact generated 8500 GWh of electricity and 84% was from renewable energy sources with 39% and 44% generated from geothermal and hydro respectively. This will increase to 95% in mid-2023 once the new Tauhara geothermal power station is operational.



Investment in new renewable generation - Tauhara

14. Today, Contact has existing geothermal capacity of 425 MW and in FY20 generated 3,333 GWh using its geothermal plants at Te Mihi, Ohaaki, Te Huka, Wairakei and Poihipi. This represents 8% of New Zealand's annual electricity supply.

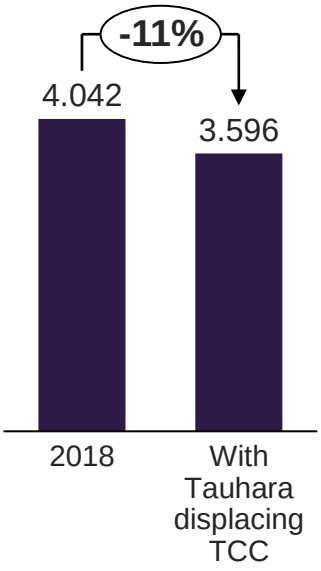
15. Contact announced a $580m development of Tauhara geothermal field in February 2021. We believe the Tauhara geothermal project is New Zealand's best baseload, low-carbon, renewable electricity development. The new 152MW plant is expected to generate an additional 1300 GWh annually – 3% of New Zealand's current generation. Tauhara will be commissioned in mid-2023.



16. We estimate that replacing fossil fuel generation with geothermal generation from Tauhara will reduce New Zealand's emissions by 450,000 tCO2e per annum. This is equivalent to removing at least 200,000 petrol cars off the road. Tauhara's geothermal electricity could power the equivalent of 1 million EVs or 25% of NZ's 4.1m domestic car fleet.

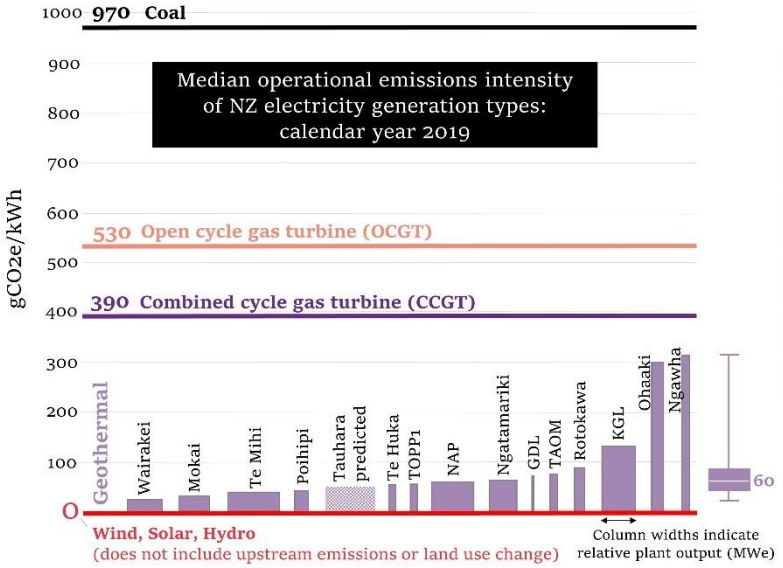
17. Contact's Tauhara investment is likely to displace generation from Contact's Taranaki Combined Cycle (TCC) gas fired baseload generation plant. In a straight substitution scenario (Tauhara generation displacing TCC), Tauhara is expected to reduce electricity industry generation emissions by up to 450,000 tCO2e each year.

If Tauhara displaced the same volume of electricity produced at TCC, this would reduce electricity Sector emissions by ~450,000 tonnes CO_2e/pa.



<u>Tauhara is very low emission.</u>

18. Tauhara is very low emission at approximately 50 gCO2e/kWh (0.05 tCO2e/MWh) once operational, which is approximately 60 gCO2e/kWh of lifecycle emissions. This compares to Combined Cycle Gas Turbine (CCGT) plants that emit nine times more operational emissions, and open cycle gas turbine peakers (OCGT) that emit eleven times more.



Plant	E.I.
Wairakei	24
Mokai	30
Te Mihi	38
Poihipi	41
Tauhara	50
Te Huka	51
TOPP1	53
NAP	59
Ngatamariki	61
GDL	70
TAOM	75
Rotokawa	88
KGL	130
Ohaaki	299
Ngawha	312
Median	60
Interquartile range	44-85
MW-weighted average	73

[1]

Geothermal's important role in decarbonisation

19. Geothermal is a particularly important form of renewable generation. It provides baseload generation, a low-cost generation source, future capacity for growth, very low emissions, opportunities for further emission reduction, and a significant residual untapped market for direct heat use.

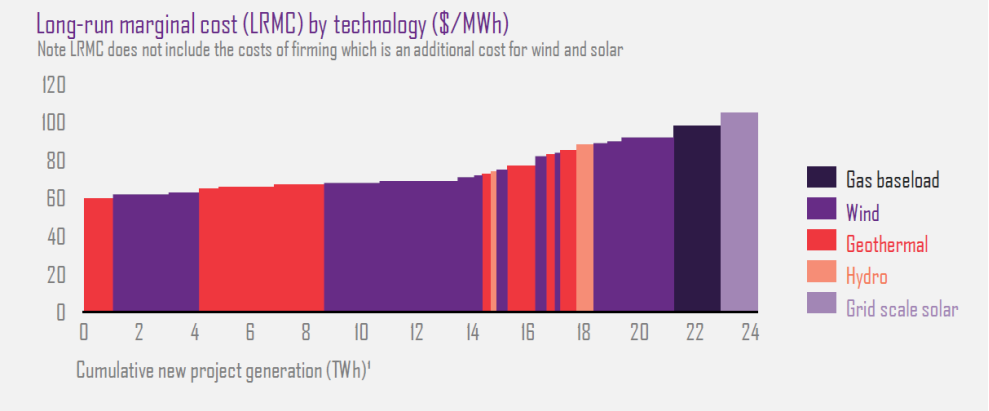
Baseload Generation

20. Geothermal provides low-cost baseload generation and is ideal for displacing baseload fossil fuel generation from the national grid. Geothermal typically achieves capacity factors of 95%, compared to the intermittency of 30 – 50% for wind power stations. An example of the reliability of geothermal is Contact's Wairakei geothermal power station which has operated at an average load factor of 90% for more than 60 years.

Low-cost Production

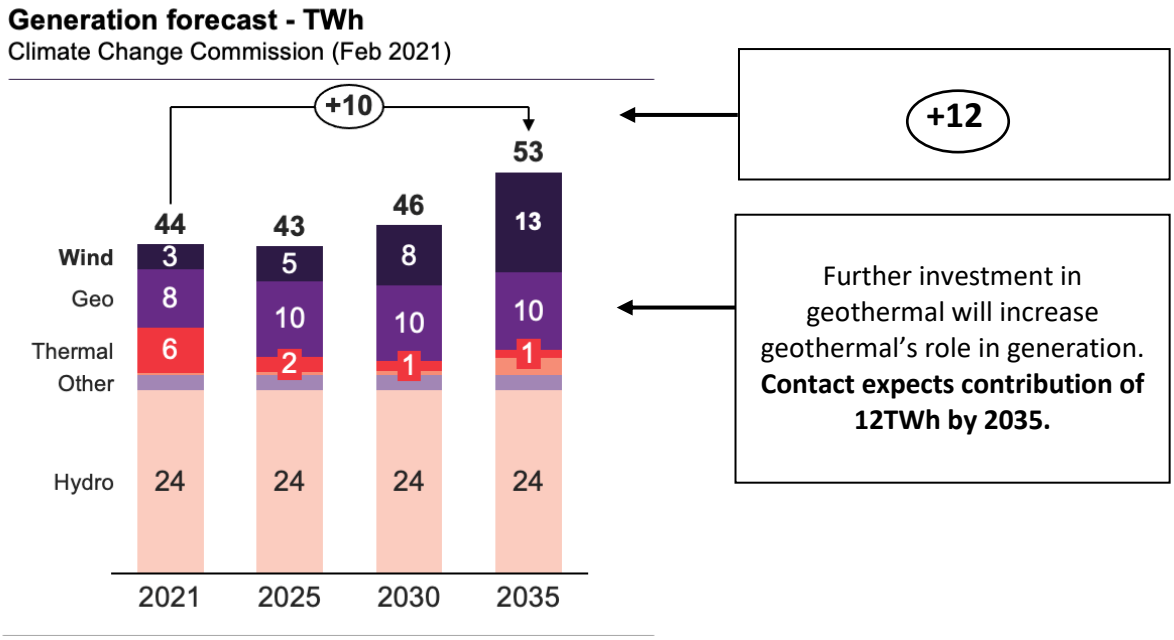
21. Geothermal is projected to be New Zealand's lowest cost renewable, and will play an important role in displacing higher cost and increasingly expensive thermal generation as carbon costs increase. Geothermal will produce over 20% of New Zealand electricity.

[1] Data for this figure comes from the New Zealand Geothermal Association (McLean et al, 2020).



Further geothermal capacity

22. The Commission's analysis assumes that geothermal generation will grow from 8TWh in 2021 to 10TWh in 2025 and then no further growth to 2035. Contact expects that geothermal generation will increase by a further 2TWh per year by 2030 as a result of investment to increase efficiency of existing generating sites, expanding capacity at existing fields such as Te Mihi and further potential expansion of the Tauhara build.



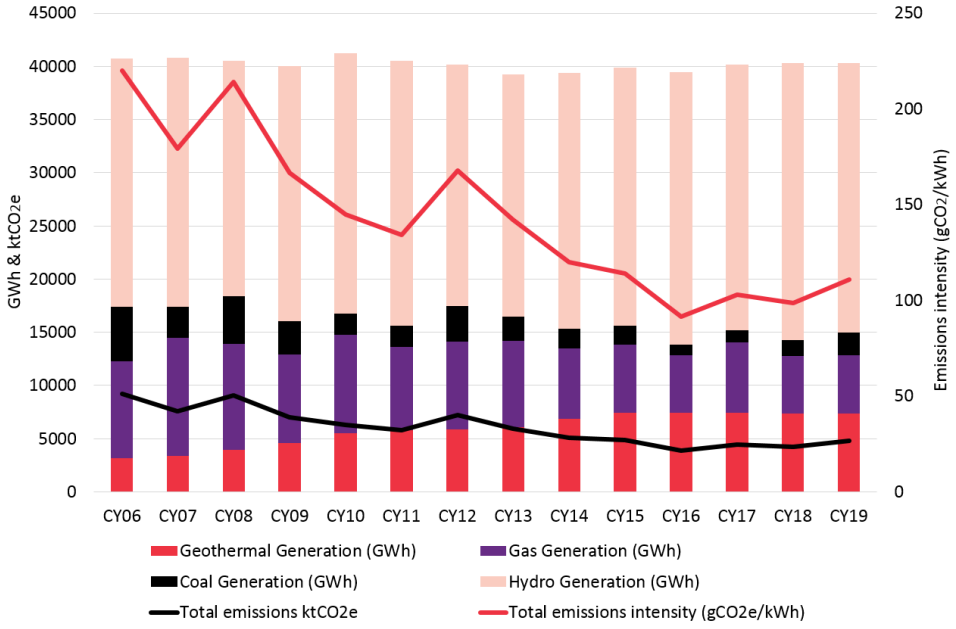
Recommendation: Model geothermal generation growth to 12 TWh by 2030

The Climate Change Commission should factor in increased growth in geothermal. Based on our analysis, we recommend that the Commission's stated contribution of geothermal is increased to:

2025	11 TWh
2030	12 TWh
2035	12 TWh

Geothermal projects displace fossil fuel emissions.

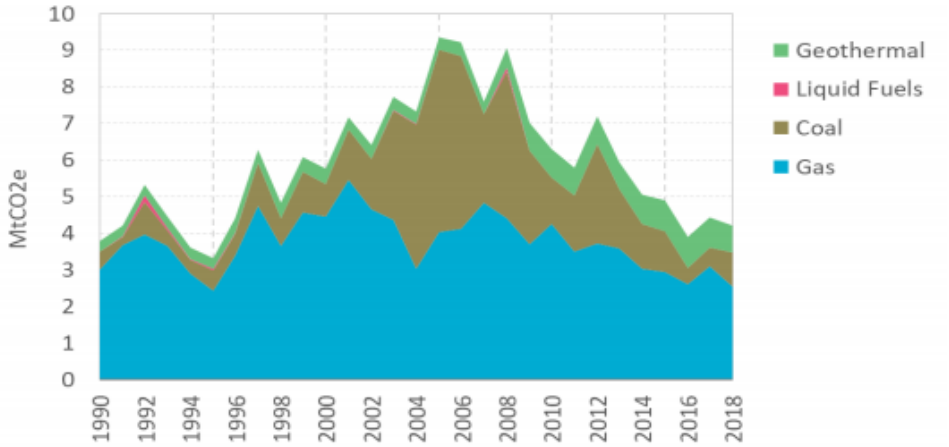
23. Since 2006 total electricity generation from all sources has remained relatively stable (see figure below). However during this time, generation from geothermal has more than doubled, displacing coal and gas generation. The effect of this has been that emissions of the overall NZ energy mix have halved, as seen in the downward trend of the total emissions and overall emissions intensity. The Tauhara development will continue this trend, displacing a further ~0.5 Mt CO2e, as described in the previous section on Tauhara.



Low emission generation

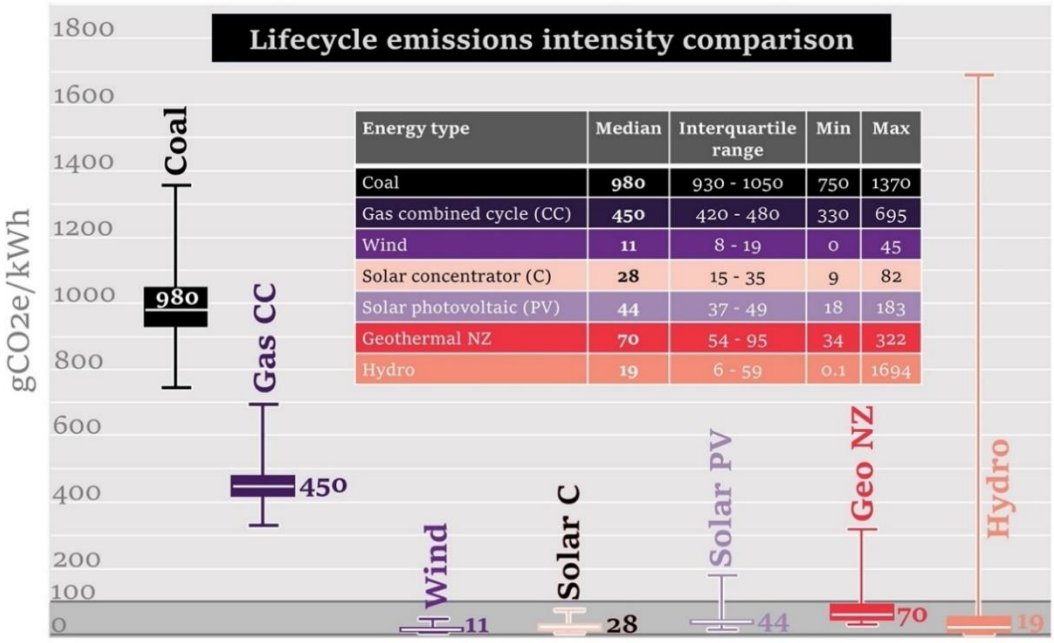
24. Geothermal emissions are a small proportion of total generation emissions. Total geothermal emissions have grown from 0.3 Mt CO_2e in 1990 to 0.7 Mt CO_2e in 2018 due to geothermal expansion.[2] However total geothermal generation has grown over the same period from 2 TWh to 7.5 TWh in 2018, meaning that emissions per unit of electricity generated have declined 31% over the period.

[2] Climate Change Commission, Chapter 4, Table 4a.3



25. Geothermal power stations generally have a low-emission profile compared to other energy sources. To fully understand the emissions from an energy project, emissions across the full lifecycle of the project, including materials and construction, land use changes, operation and maintenance, and decommissioning must be considered.

26. Geothermal lifecycle emissions are an order of magnitude less than fossil fuel sources. While several renewable energy sources have outliers with very high emissions (including hydro, solar PV and geothermal) the vast majority (as shown by the inter-quartile range) have emissions less than the threshold of 100 gCO2e/kWh.[3]



Energy type	Median	Interquartile range	Min	Max
Coal	980	930 - 1050	750	1370
Gas combined cycle (CC)	450	420 - 480	330	695
Wind	11	8 - 19	0	45
Solar concentrator (C)	28	15 - 35	9	82
Solar photovoltaic (PV)	44	37 - 49	18	183
Geothermal NZ	70	54 - 95	34	322
Hydro	19	6 - 59	0.1	1694

[3] Data for this plot comes from the US National Renewable Energy Laboratory (NREL) review and harmonisation of the IPCC lifecycle emissions data published in 2011, the International Hydropower Association, and the New Zealand Geothermal Association.

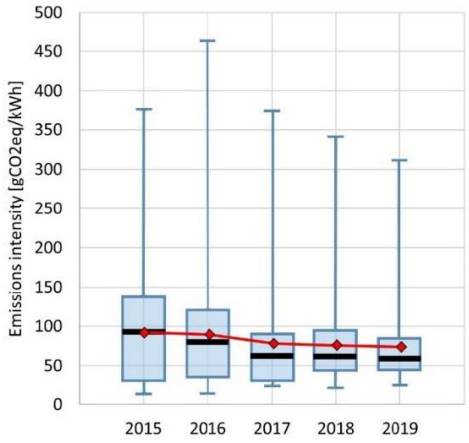
Significant potential for growth in direct use

27. Geothermal energy can be used directly for process heat, without conversion to electricity. Examples of geothermal direct use include Kawerau Industrial Park, Tenon, and Nature's Flame, which displace significant emissions from the alternative fossil fuel energy sources. For example, the conversion of the Tenon timber drying facility to geothermal from natural gas reduced Tenon's emissions by 93%, or approximately 20,000 tCO2e each year.[4]

28. There are further opportunities to increase the direct use of geothermal, which Contact believes is currently under-utilised. Direct use has not grown as further geothermal power generation investment has and is currently at the same level as it was in 1990.

Geothermal emissions reduce naturally

29. Emissions from geothermal electricity decline naturally over time as the result of reservoirs degassing. The box and whisker plot of overall emissions intensity of geothermal power stations from 2015 to 2019 shows the declining emission intensity.[5] Black is median emissions intensity, while red is the weighted average emissions intensity.



Path for further emissions reduction

30. Geothermal emissions can be reduced by returning the gases underground by Non-Condensable Gas (NCG) reinjection.

31. The energy for geothermal electricity generation comes from reservoirs of hot water and steam which exist naturally underground, and also contain dissolved gases. These hot fluids are brought to the surface where heat energy is extracted from the fluids during the power generation process before the fluids are returned to the underground reservoir via a process called reinjection.

32. Dissolved gases are carried to the surface within the fluid, where they take a gaseous form and are vented in a controlled manner from geothermal power stations. It is possible to redirect the gas stream and re-dissolve the gases in the reinjection fluid and hence return them to the reservoir underground, a process called non-condensable gas (NCG) reinjection.

[4] McLean et al., 2020 New Zealand Geothermal Association Working paper
[5] McLean et al., 2020

33. The capture of NCGs in geothermal also enables alternative uses of Carbon Dioxide instead of releasing it to atmosphere. Carbon Dioxide is a valuable commercial product and its capture from a natural source can help to displace its creation via fossil fuel processing. The use of carbon dioxide in industry or horticulture for example is an alternative option available to reduce geothermal emissions.

34. Following the emergence of this technology internationally, Contact has a project to trial NCG reinjection at the Te Huka geothermal plant, as this plant type (binary) is the simplest to implement an NCG reinjection system. Success with the initial trial could lead to installation across the geothermal fleet.

35. NCG reinjection will be field-specific, with the level of success dependent on reservoir geology, natural levels of gases in the reservoir fluid, reservoir pressure, and power plant type.

Higher Emission geothermal fields

36. The Commission identifies that emissions intensity from Ohaaki and Ngawha are significantly higher when compared to other geothermal power stations. This is a result of naturally high levels of dissolved gases in the reservoir fluids (see figure above).

37. The Commission's draft advice is that these fields should close by 2030, noting that the overall effect of these closures for the geothermal sector would be a 25% reduction in emissions for only a 6% reduction in generation. However, if the target is a 25% reduction in geothermal emissions across the geothermal fleet, this could in fact be achieved with no loss of generation via NCG reinjection as discussed above.

38. Plant closures are not the best option to reduce emissions and Contact does not support the view that Ohaaki and Ngawha should be recommended for closure.

Recommendation: **Geothermal Emissions**

The Commission's draft recommendation is that high emitting geothermal fields should close before 2030, reducing geothermal emissions by around 25% while reducing geothermal generation by 6%.

Contact does not support this recommendation. Technology development with carbon reinjection will further improve the emissions efficiency of geothermal over time. Any displacement of geothermal fields should only occur at such time as coal and gas has been fully displaced given its comparatively low emissions profile. Increasing carbon prices will create strong incentive to reduce emissions from higher emitting plants and the further development of NCG.

This can be implemented through the Commission's recommendation of a National Energy Plan.

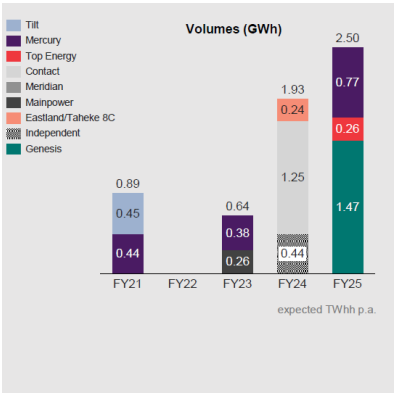
Renewable Generation Investment Pipeline is Strong

39. There are a significant number of confirmed and planned generation projects across New Zealand. These projects will deliver the following benefits:

- Increasing baseload renewable generation;
- Displacing thermal baseload and peaking plant with renewable generation;
- Reducing the cost of energy through transition from higher cost thermal to lower cost renewable generation; and
- Private sector investment without government subsidy.

40. Contact estimates that this renewable generation pipeline across the industry, as projected, will result in renewable generation of 92% by 2030 – all without government investment.

Project name	Company	Type	Region	MW	GWh p.a.	Est. FY commissioning
Waipipi	Tilt	Wind	Lower North Island	133	450	2021
Turitea1	Mercury	Wind	Lower North Island	119	438	2022
Turitea 2	Mercury	Wind	Lower North Island	103	379	2024
Tauhara	Contact	Geo	Lower North Island	152	1,250	2023
Harapaki	Meridian	Wind	Lower North Island	176	540	2024
Mt Cass	Mainpower	Wind	Upper South Island	78	260	2023
Omamari	Tilt	Wind	Upper South Island	73	243	2024
Puketoi	Mercury	Wind	Lower North Island	200	771	2026
Taheke	Eastland/Taheke 8C	Geo	Lower North Island	25	90	
Tararua 1 & 2 repowering	Tilt	Wind	Lower North Island	90	339	2026
Solar PV	Independent	Solar	Upper North Island	50	79	
Ngawha 4	Top Energy	Geo	Upper North Island	31	260	2025
Kaiwera Downs	Tilt	Wind	Lower South Island	240	840	
Castle Hill	Genesis	Wind	Lower North Island	400	1471.68	2025
South Kaipara head	Meridian	Wind	Upper North Island	150	512.46	2026
Kaimai	Independent	Wind	Upper North Island	125	438	2024
Hurunui	Meridian	Wind	Upper South Island	75	249.66	2026



41. Contact itself has a further $800m pipeline of long-life renewable projects including:

- Replacement and expansion of Wairakei up to ~167MW;
- 50MW North Island battery investment; and
- Exploring wind opportunities across New Zealand

42. Contact is well positioned to meet new market demand and displace higher cost thermal generation over the medium-term.

43. Realising these investments will require:

- Investor certainty – reasonable certainty that market rules won't change once investment is made;
- Demand growth – maintaining the demand-supply balance will be key. Demand growth will occur through new commercial opportunities including Hydrogen, the substitution of process heat and electrification of transportation; and
- Government investment does not crowd out private sector investment.

Contact Thermal Review

44. Contact agrees with the Commission's analysis on the declining importance of gas fired thermal generation, but that it will continue to be an important part of the electricity generation system in the medium term. Contact operates baseload and thermal peaking generation plants that use gas and diesel fuel.

45. Contact has announced a strategic review of its thermal portfolio. We believe it is the appropriate time to review these assets for the following reasons:

- Our strategy is to be a leader in New Zealand's decarbonisation;
- Tauhara geothermal investment is expected to displace thermal generation and move Contact from 83% to 95% renewable generation by 2024; and
- tightening gas supply and increasing thermal fuel costs (including increasing carbon costs) will make renewable generation comparatively cheaper.

46. As renewable generation investment increases, Contact (and the industry) will need to plan for the orderly retirement of thermal assets. The Commission's proposed National Energy Plan will be useful as a roadmap, and better allow for the coordinated retirement of thermal generation. A coordinated approach will ensure that fossil fuel use is sequentially removed from generation, beginning with the most emissions-intensive fuels first such as coal.

Recommendation: **National Energy Plan**

The development of the National Energy Plan should specifically set its objective for the phased removal of fossil fuels that focus on fossil fuels being sequentially removed over time based on the relative emissions efficiency.

Batteries to balance intra-day demand

47. Contact is actively exploring investments that will reduce peak demand. This includes the potential investment in a 50MW North Island battery that will leverage renewable generation during periods of low demand intra-day. Its purpose would be to provide peaking generation, instantaneous reserve and voltage support.

48. By storing energy in grid scale batteries during periods of low demand using renewable generation, energy can then be released during peak demand regularly, and ultimately reduce the reliance on thermal generation when demand is high or other generation is scarce. Internationally, gird scale batteries have proven to be cost effective and rapidly scalable.

49. The Electricity Authority and Transpower are currently working through changes to the Transmission Pricing Methodology (TPM). Unfortunately, the structure of the TPM does not contemplate future technologies such as grid-scale batteries, and will impose a punitive cost for the battery operator – making any investment case challenging.

50. The TPM change from pricing based on a Regional Capacity Peak Demand (RCPD) to Anytime Maximum Demand (AMD) would result in the battery being treated as energy user, rather than a mechanism to time-shift generation capacity.

51. Transmission charges under AMD mean that a grid-connected battery will simply not get built and more expensive alternative options will be required, such as gas-fired peakers, transmission solutions and voltage support devices.

52. Amendments to the TPM have taken over a decade and are still being finalised. The TPM requires a further discrete amendment to reflect the unique characteristics of grid-connected batteries which are effectively both a generator and a load customer. While there is a general recognition of the significant benefits that grid-scale batteries offer for decarbonisation and demand management, indications from Transpower and the Electricity Authority are that it will take several years before this issue can be addressed.

Recommendation: **Batteries and Transmission Pricing**

Contact encourages the Commission to recommend specific policy from the government to immediately address the TPM and ensure that accelerated investment in grid-scale batteries occurs. It is unacceptable to face a multi-year delay as a result of flawed TPM settings, which will impede decarbonisation of electricity generation.

Hydrogen

53. Hydrogen is likely to play a greater role in decarbonisation in New Zealand than the Commission suggests.

54. In December 2020, Contact and Meridian announced the co-funding of a $2 million feasibility study to investigate the potential of a large scale, renewable hydrogen production facility in the lower South Island. The potential facility would replace electricity demand currently being consumed by the Tiwai Point aluminium smelter. The smelter's electricity contract expires end-2024 and there is no certainty of ongoing operations beyond that.

55. Our vision is to use New Zealand's extensive renewable energy resources to develop a world class hydrogen production facility, one that supports fuel transition and carbon abatement strategies in selected global energy markets while providing a platform to decarbonise New Zealand's own transport and industrial sectors.

56. There is global recognition that in order to meet the Paris objectives, hydrogen produced from renewable electricity will have a role to play, particularly in hard to abate sectors where electricity and batteries are ill-suited. We think New Zealand has the potential to tap into this macro trend and we are actively focused on identifying and pursuing opportunities.

57. An at-scale hydrogen production facility could provide a demand-side electricity response during periods of sustained high prices. Our modelling suggests that depending on the scale of the hydrogen production facility, between one-third and one-half of New Zealand's dry year problem could be addressed in this manner.

58. The Commission's draft analysis does not specifically model the positive role that hydrogen can play in decarbonisation. While it may be premature to include in the Commission's modelling, our exploratory work on hydrogen opportunities provides us with significant confidence of its future role and ability to help exceed energy decarbonisation objectives in the medium term.

Science-based Target Initiative (SBTI)

59. Contact was the first energy company in New Zealand to commit to a science-based target. In 2018 we committed to reduce our Scope 1 and 2 emissions by 30% by 2030. This was aligned with the science of a 'well-below' 2 degrees pathway.

60. Since 2018, we have reduced our Scope 1 and 2 emissions by 22% through the strategic use of our renewable assets combined with a number of emissions reduction and emissions efficiency projects across our fleet.

61. Contact has recently applied to the Science Based Targets Initiative to increase our target ambition in line with the Intergovernmental Panel on Climate Change recommendation that global warming must not exceed 1.5 degrees Celsius. Our new targets will be:

- To reduce our Scope 1 and 2 absolute emissions by 45% by 2026;
- To reduce our Scope 1 and 2 emissions intensity by 50% by 2026; and
- To reduce our Scope 3 emissions by 34% by 2026.

Supporting and working within the communities we operate

62. Contact is pleased that Commission recognises the importance of giving effect to the Treaty partnership, and the importance of recognising this partnership by acknowledging iwi/Māori rights to exercise rangatiratanga and kaitiakitanga in a joint plan to reduce emissions.

63. We also agree with the Commission's view that an "equitable transition means making sure the benefits of climate change are shared across society, and that the costs of climate transition do not fall unfairly on certain groups or people."[6]

64. Contact has set a range of environmental, social and governance (ESG) targets which aim to demonstrate our commitment to leaning in on the big issues that our communities face.

65. Energy costs are likely to increase during the decarbonisation transition because of higher gas input costs used for generation. In making any changes to pricing, Contact specifically considers the impact on vulnerable New Zealanders, consistent with our pricing principles and tikanga.

66. We're acutely aware of the importance of supporting vulnerable customers. We work with customers having a challenging time and have a wide range of tools to help people stay connected. This includes early and proactive intervention, different payment options, prepay services, health and welfare checks for customers, EnergyMate energy assessment referrals, and working with external support agencies including the FinCap budgeting service and Work and Income. We're also involved in Electricity Retailer Association of New Zealand (ERANZ)'s Vulnerable and Medically Dependent Consumer Working Group, which brings together people from across the electricity sector, government departments, regulators, and community organisations.

67. Contact invests in a number of biodiversity programmes, which aim to both regenerate our precious ecosystems and education and share a love of the environment with the next generation. In Taupō we sponsor Kids Greening Taupō, Kiwi Contact Kiwi, and our staff volunteering on community environmental projects. In Taranaki we have partnered with the Taranaki Kiwi Trust and sponsor environment action in education awards, and in the South Island we sponsor the Alexandra Blossom festival and the Contact Epic.

[6] Climate Change Commission Report, p.11

68. Across our generation sites Contact has also planted 26,500 native trees in the last financial year since 1 July 2021, and more than 166,000 native trees in the last 5 years in partnership with our communities.

69. We support the recommendation that the Government develop an Equitable Transitions Strategy that outlines the distributional impacts of climate change policy decisions to ensure they align with tikanga values, factor in distributional impacts, and provide guidance of distributional plans.

Working with our customers to decarbonise

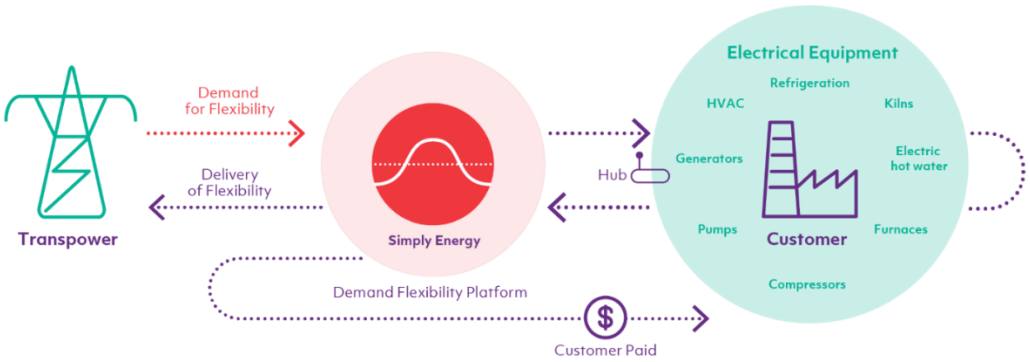
70. Contact owns Simply Energy, which takes care of the day-to-day energy supply for many of New Zealand's largest businesses and enterprises. The same team, working with a network of energy industry partners, is also responsible for the design and set-up of innovative energy solutions.

Electrification of Process Heat

71. Contact and Simply Energy are working with commercial customers to electrify process heat, and we endorse the Commission's support for targeted support to accelerate such electrification, including, for example, accelerated build out of transmission network capacity in anticipation of electrification. We've worked with Open Country Dairy in Southland Awarua plant to provide the largest electrically powered boiler in New Zealand. Significant new opportunities exist in meat processing, glass house horticulture and aquatic centres exist.

Demand Flexibility

72. Simply Energy Demand Flexibility enables customers with a suitable load profile to automatically reduce power consumption from selected equipment to support the grid at times of peak demand and share in both the electricity and environmental savings as a result.



73. The programme is supporting grid stability, reducing peak demand and the reliance on fossil fuel generation to meet it.

74. Our portfolio includes 10MW of load participating in Transpower's fast reserves market and 5MW participating in its demand response market.

75. Simply has identified around 400MW of potential controllable load on commercial and industrial sites across the North Island and is investigating future emissions reducing opportunities such as:

- *wholesale generation dispatch*, whereby Contact would utilise load reduction across the Demand Flex customer portfolio to meet overall generation demand;
- *network charge management* which would support customers to manage demand on site to reduce network charges and emissions;
- *load curtailment and shifting* whereby customers can keep their electrical load within their available electricity capacity, and during periods of high demand, shift it to when demand and prices are lower to enable electrification opportunities; and
- *smart battery control* enabling customers to decide whether to charge, discharge or store energy, based on market conditions.

Other key focus areas

Simply is offering and developing a range of solutions to help customers better manage their energy usage and become more energy efficient, including:

- *developing online access to consumption and emissions data* which will be the first of its kind for commercial and industrial customers in New Zealand;
- *enabling customers to reduce their plug load consumption* with smart, controllable plugs, via an exclusive arrangement to distribute US-based Sapient's plug load management system in New Zealand and Australia; and
- *supporting customers transition their fleets to electric* through advice and partnerships with companies such as Optifleet to provide fleet reviews, and Thundergrid to provide infrastructure reviews.

Recommendation: **Demand Flexibility**

Innovation such as Demand Flexibility services is expected to grow rapidly, with the benefit of reducing peak demand where thermal generation is most likely to be required.

Contact recommends that the Commission model reduced intra-day peak demand as a result, coupled with the expected investment in grid-connected batteries that will similarly better balance demand.

Commission's draft report

Emissions Budgets

76. Contact agrees with the Commission's conclusion that New Zealand is not currently on track to meet its obligations – with most expected net emission reductions currently coming from forests planted by 2050. Contact Energy agrees with the science-based first three budgets that will be required to meet the government commitments out to 2030.

77. Contact supports the breakdown of emissions budgets between long-lived gases, biogenic methane, and carbon removal from forestry.

78. We also agree that emissions budgets should be met as far as possible through domestic action.

Coordinated and enduring emissions budgets and policy

79. New Zealand must have an enduring solution for emissions budgets that will provide businesses and individuals with the confidence to make decisions and invest with certainty. New renewable generation investment is considered over a 20 – 30 year investment timeframe.

80. Changes based on political cycles create significant uncertainty and risk chilling incentives for further investment. The government must take a single coordinated and systems-based approach to the policy recommendations across central and local government.

81. Contact strongly supports the Commission's view that an enduring system must achieve broad political consensus across all parties.

Contact is aligned with Commission's focus on emission reduction rather than offset

82. Contact agrees with the Commission's focus to reduce gross long-lived gas emissions by decarbonising the sources of long-lived gas emissions wherever this is possible, and to build a long-term carbon sink large enough to offset residual long-lived gas emissions without ongoing land use conversion.[7]

83. We also agree that the decarbonisation should be prioritised over sequestration where possible. Contact's decarbonisation strategy is focussed on removal. However, where it is not possible in the medium term to remove emissions fully, Contact seeks to offset its impact through sequestration.

84. Contact is a partner in Dryland Carbon together with Air New Zealand, Genesis and Z Energy. Dryland Carbon is establishing a geographically diversified forest portfolio to sequester carbon and produce a stable supply of forestry-generated NZU carbon credits to meet ETS obligations.

[7] Climate Change Commission draft report, p.48

85. Dryland Carbon has a clear focus on marginal land, and is consistent with the Commission's approach, by working with the rural community to find marginal land, rather than encroaching on productive land.

86. We recognise the Commission's concern about ongoing land use conversion for forestry. Dryland Carbon specifically targets marginal, unproductive and often erosion-prone land for conversion to sustainable forestry for both tree harvest and carbon farming.[8]

87. While Contact directionally supports the challenge by the Commission to increase native forestation, the economics of native rather than exotic planting remain challenging, and the faster storage of carbon – between 3 – 6 times faster and at higher levels than native forests. Further work is required by government to ensure that the sequestration benefits are not lost as a result of any policy changes.

88. Mandating native planting would materially increase reforestation costs and could reduce ongoing incentives for further forestry investment. To minimise this risk, the Commission's recommendation to government should be accompanied by supporting policy that addresses the cost differential.

Recommendation: **Sequestration**

Contact supports the planting of natives in preference to exotics. However, any recommendation should include complementary measures that address the cost differential, to ensure that future sequestration on marginal land is not undermined.

Relaxation of 100% renewable generation goal

89. Contact agrees with the Commission's view that the government should move away from the 100% renewable generation by 2030 target, and instead adopt a 60% energy target, on the basis that the costs to achieve 100% at this time would be prohibitive, and result in a material increase in retail electricity prices.

90. We agree with the advice (consistent with both the Productivity Commission and the ICCC) that:

> *Going from 99% to 100% renewable electricity only reduces emissions by a small amount (less than 0.3 Mt CO2e) at an emissions abatement cost of over $1,200 per tonne of CO2e. It is also very likely to result in much higher retail electricity prices than in the business-as-usual future*.[9]

91. Committed industry investment such as Tauhara demonstrates that rapid decarbonisation will occur. Increasing carbon costs through the ETS will further incentivise further renewable investment. Artificially accelerating the timeframe to achieve 100% should not come at any

[8] https://www.drylandcarbon.co.nz/

[9] Interim Climate Change Committee Accelerated electrification evidence, analysis and recommendations, 30 April 2019, p. 97.

cost, particularly where cheaper opportunities exist to remove carbon.

92. At a recent Business Energy Council briefing, the Minister of Energy appeared to discount the Commission's preliminary advice, and that the Commission's proposed alternative target of 60% renewable energy and 100% renewable generation were both achievable. We recommend that the Commission expands the analysis to clarify the interaction between the two goals, and its cost impact.

93. To be clear, Contact remains committed to decarbonising electricity generation, and 100% renewable generation should remain a long-term goal. However, we also recognise that decarbonising the final few percent would be prohibitively expensive in the medium term. Those costs would be borne by New Zealanders – either as higher retail energy costs or significant government expenditure.

94. As the Commission identifies, there are alternative options that will deliver greater decarbonisation for lower cost.

Gas will continue to have an important role in the medium term

95. There will be an ongoing but diminishing role for gas in the medium term. We see gas, particularly for baseload generation, having a declining role in the New Zealand electricity market.

96. We agree with the Commission's analysis that some gas generation will be required to provide some flexibility until 2035 at least. This will ensure we meet the challenge to deliver a reliable and affordable electricity system.

97. The development of renewable baseload is likely to rapidly reduce ongoing dependence on either coal or gas baseload in the medium term. Residual gas requirements are likely to remain to meet intra- and inter-day peak demand. Contact and other generators are continuing to invest in renewables to reduce residual reliance and ultimately displace gas as part of the electricity generation eco-system altogether.

98. We think it likely that gas supply will remain tight over the medium-term which will place upside pressure on price. Attracting capital to undertake the remediation work required and develop new resources to replace declining reserves is challenging for upstream producers in the context of a declining market and increased regulatory pressure.

New Zealand Battery Project

99. Contact agrees with the caution expressed by the Commission with the New Zealand Battery project. The government will evaluate solutions against its preferred option of pumped hydro at Lake Onslow / Manorburn. The purpose of the project is "to manage or mitigate dry year risk in the electricity system".[10]

100. The ICCC modelling showed that greater emissions savings could be achieved through accelerated electrification of transport and process heat. We will be fully engaging in the

[10] Cabinet paper, *December 2020 Update on the NZ Battery Project*, 16 December 2020

upcoming consultation. However, we do have initial concerns that will require detailed investigation, including:

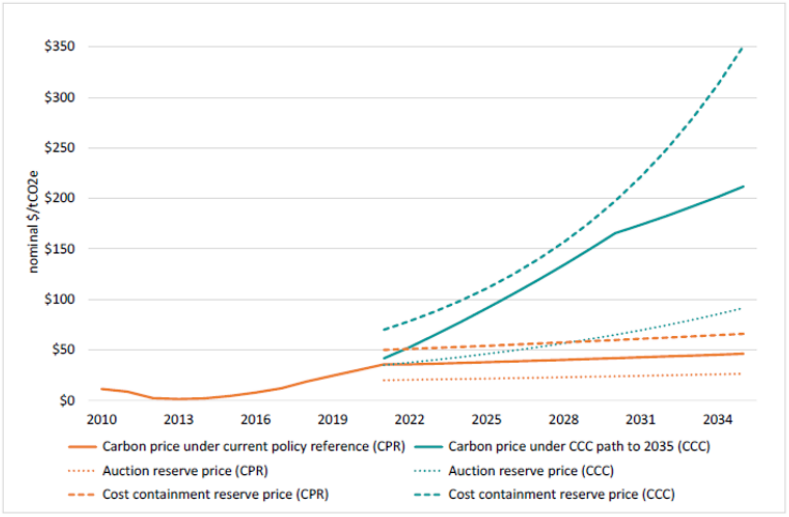
- the geological risks of the region;
- the seismic risks of the region;
- potential for lower cost alternatives that offer greater flexibility such as hydrogen production and demand flexibility, providing a demand-side response in a dry year;
- the project may not address sequential dry year risk:
- significant uncertainty on the development cost of $4b. Similar projects internationally have faced significant cost overruns that were met by the taxpayer;
- increased pressure on freshwater resources; and
- risks of chilling further private sector baseload investment.

101. Ultimately, we expect that private sector investment will deliver very close the government's objectives, using cost-efficient new generation such as Tauhara, expected new investment such in wind and solar, and technologies such as interruptible electricity load used to produce hydrogen, and demand-flex.

Emissions Trading Scheme

102. The Commission concludes that the ETS should go further and faster. We support the Commission's recommendation to strengthen the ETS. The benefit of recognising the full cost of carbon including externalities is that it leads to efficient decision making to remove carbon. The focus of the Commission's budget setting is to put New Zealand on track to meet its domestic and international decarbonisation commitments.

Figure 1 Current and proposed ETS Auction Reserve prices and Cost Containment reserve prices



103. The draft advice indicates that the long-term abatement cost for investment should be $140/tCO$_2$ by 2030, and a potential carbon price of $170/tCO$_2$. Contact recognises that there will be significant impacts as businesses and individuals transition to higher carbon prices, and change behaviour.

104. The Commission notes that the government has choices to make, between reliance on the ETS or other policies to reduce emissions, and that "[t]he more that non-ETS policies are used, the more likely it is that the NZU price in the NZ ETS can be lower while still achieving the same overall amount of emission reductions".[11]

105. Policy has a key role in removing the hard edges of market led transition. The ability to avoid higher costs because of higher carbon prices will differ between individual consumers and businesses. This is where government policy has a central role to reduce costs and barriers to decarbonisation (such as streamlining the RMA and providing subsidies for EV transition) and mitigating any impact to vulnerable New Zealanders and communities who may be unable to either transition or absorb any increasing cost.

106. The relationship between the recommended policies and impact should be tested further, to ensure proposed policies and ETS are consistent, work in parallel and do not stifle innovation.

107. As the Commission identifies, revenue from the ETS could equate to at least $3.1b over the next five years. Contact recommends these ETS revenues are ringfenced, and recycled back into climate change projects across central and local government.

Recommendation: **ETS**

Contact recommends that ETS revenue is specifically ringfenced for decarbonisation projects.

[11] Climate Change Commission, supporting evidence for consultation, Chapter 17, page 5.