Proceedings World Geothermal Congress 2026
Calgary, Canada, June 8 – 11, 2026

Low Carbon Geothermal Heat Energy – Geoheat in New Zealand Advancing Decarbonisation of Industrial, Commercial and Horticultural Process Heat

Samantha Alcaraz[1], Brian Carey[1]*, Yale Carden[2], Celia Wells[2], Greg Moore[3], Mark Gibson[1],
Earth Sciences New Zealand[1]*, GeoExchange NZ[2], Dobbie Engineers[3]
b.carey@GNS.cri.nz

Keywords: geothermal, process heat, decarbonisation, low carbon energy, energy transition, Regional Energy Transition Accelerator, New Zealand, Bay of Plenty

ABSTRACT

Geothermal heat offers an opportunity to decarbonise some process heat applications across New Zealand. This covers processes requiring heat at temperatures up to 120°C, and possibly160°C using heat pumps, and in specific locations process heat at temperatures up to 220°C where high temperature geothermal resources can be used directly, such as in the central part of the North Island.

This paper outlines the current energy landscape in New Zealand, explores the future outlook for natural gas, coal, and carbon pricing, and highlights two initiatives led by the Energy Efficiency and Conservation Authority (EECA) aimed at decarbonising process heat. The two initiatives are the Government Investment in Decarbonising Industry fund that was established to accelerate emission reductions by supporting energy efficiency and fuel switching and the Regional Energy Transition Accelerator (RETA) programme that is developing region-by-region energy transition roadmaps.

Earth Sciences New Zealand, Dobbie Engineers and GeoExchange Australia Pty Ltd contributed to the geothermal section of the Bay of Plenty Region RETA project, published in 2024. Two sites and three applications across the broader Bay of Plenty Region were analysed with net emissions reductions of about 90% compared to the fossil fuels currently being used at each of the sites. In the Marginal Abatement Cost optimal pathway EECA identified geothermal as the optimal fuel for all five cases analysed.

The analysis included a hospital, a greenhouse, a salt drying application, a milk processing application and a paper machine conversion.

The paper canvasses the work reported and the benefits that geothermal offers as New Zealand works on decarbonising process heat.

1 INTRODUCTION

Geothermal energy is widely available across New Zealand (NZ) in the groundwater (<30 °C) and in a number of locations where geothermal water[1] is accessible from low to high temperatures (>30 °C and up to ~300 °C). This thermal energy is available for use in various process heat applications with different technologies used to supply the energy to meet the temperature requirements of a given process.

The New Zealand Geothermal Association Geoheat Strategy for Aotearoa NZ, 2017 to 2030 (Climo et al 2017), recognised that much more use of geothermal heat in process applications could assist with regional economic development and contribute to the energy decarbonisation transition toward net zero by 2050.

This paper discusses some of the drivers that are shifting the energy landscape and activity that is under way to transition from fossil energy to renewable energies and in particular geothermal energy. The paper provides context on the energy sector in NZ, presents a forward-looking view on natural gas, coal, and carbon pricing, and provides information on two initiatives undertaken by the Energy Efficiency and Conservation Authority (EECA) since 2020 supporting process heat decarbonisation:

- Government Investment in Decarbonising Industry (GIDI) fund

[1] Geothermal water is defined in the Resource Management Act 1991 as water in the ground at 30°C or above.

- Regional Energy Transition Accelerator (RETA) programme

Earth Sciences New Zealand (previously known as GNS Science), Dobbie Engineers and GeoExchange Australia Pty Ltd (GeoExchange) contributed a geothermal energy section to the EECA Bay of Plenty (BOP) RETA study which included an assessment of applications at five sites. A summary of the assessments is included in this paper.

2 NEW ZEALAND ENERGY AND CARBON OUTLOOK

2.1 Natural Gas Pricing and Future Availability

Natural gas has been relatively readily available in NZ, particularly in the North Island since the Kapuni gas field commenced commercial production in 1970 and also from the offshore Maui field that commenced production in 1979. More recently the situation in the gas sector has been changing rapidly:

- The price, New Zealand Dollar per Giga-Joule (NZD per GJ), has increased rapidly in the last 15 years (Figure 1). Recent spot market volatility has seen rapidly increasing contract prices along with decreasing contract durations.
- The New Zealand gas reserves are dwindling rapidly, declining faster than earlier anticipated and most fields are in late-stage decline.

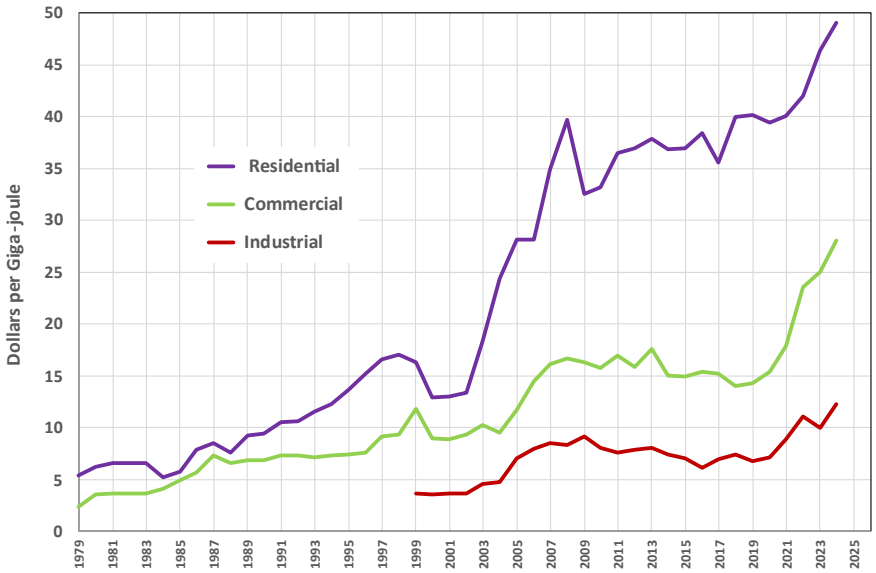


Figure 1: Residential, Commercial and Industrial sector natural gas price (MBIE Energy Price data tables).

2.2 Cost of Carbon

Carbon charges under the New Zealand Emissions Trading Scheme, which came into existence in 2008, are applicable to many industrial and larger commercial applications.

Through 2021-2022 the cost of carbon increased significantly (Red line under the blue square in Figure 2) before fluctuating around NZD 60 per tonne over subsequent years. The Ministry for the Environment (MfE) has a projected carbon price path with carbon reaching NZD 250 per tonne by 2050 (green line Figure 2)).

2.3 Emissions Policy and regulation

In July 2023, the NZ Government, through the Resource Management Act 1991 (RMA), introduced a National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat (MfE 2023) and a National Environmental Standard for Greenhouse Gas Emissions from Industrial Process Heat (RMR 2023) that require fossil fired heat producing facilities emitting greenhouse gases to embark upon a transition to; reduce energy input, plan for transitioning from fossil energy, and apply for discharge consents under the RMA. The purpose is to set out actions and methods to reduce the carbon dioxide equivalent (CO_2e) greenhouse gas discharges from the activity, including by meeting emission reduction targets, encouraging best practices in energy efficiency, and the transition from heat devices that burn fossil fuels to alternative fuel sources or no fuel at all.

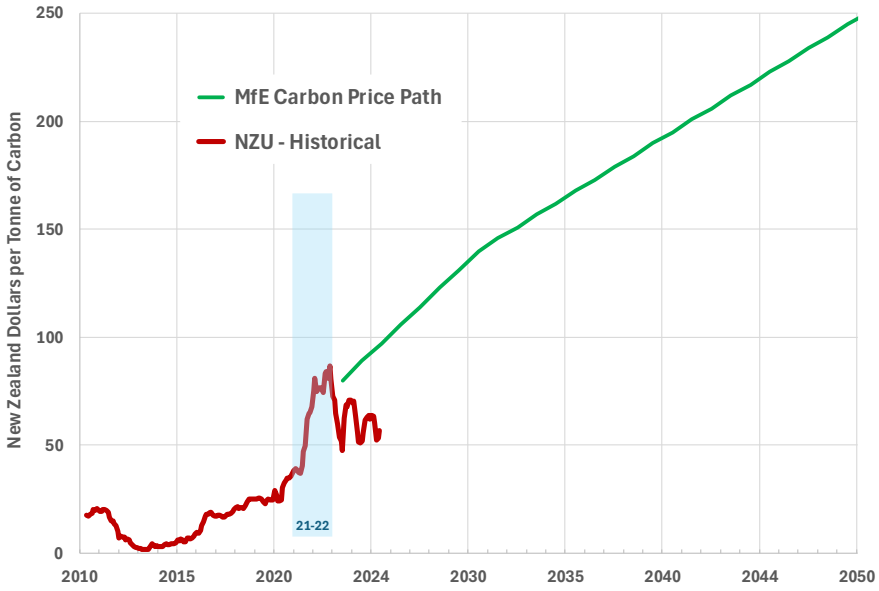


Figure 2: New Zealand carbon cost – NZU 2010 – 2025 (Github.com/threecanmole/nzu) and MfE forward carbon price path to 2050.

2.4 Prohibition of Coal Fired heat production for applications requiring temperatures less than 300°C

Through the RMR (2023) the government prohibited the installation of new coal boilers producing heat for applications requiring heat at less than 300°C. This came into effect from July 2023. Existing coal boilers are to be phased out by 2037.

2.5 Geothermal Energy for Process Heat

With the regulatory thrust to reduce coal utilisation, the increasing volatility and uncertainty in the natural gas sector, the increasing cost of carbon and the increased greenhouse gas regulatory requirements have all resulted in a growing interest in geothermal energy, including ambient and low temperature geothermal energy, which is widely available across New Zealand.

3 ENERGY EFFICIENCY AND CONSERVATION AUTHORITY

EECA has had several programmes seeking to assist businesses to decarbonise their energy input. Two programmes discussed here are the:

- Government Investment in Decarbonising Industry fund (GIDI)
- Regional Energy Transition Accelerator (RETA) programme

3.1 Government Investment in Decarbonising Industry Fund

The GIDI Fund was established in 2020 and ran until late 2023. The fund was established to accelerate emission reductions from industrial process heat use by supporting energy efficiency and fuel switching. Organisations and businesses applied to EECA for co- funding support for emissions reduction projects that they were going to implement. Individual projects had to have a total capital cost of greater than NZD 500,000 and the GIDI Fund co-funding contribution granted would normally not exceed NZD 5 million.

Across six funding rounds 78 projects have been co-funded to a total value of NZD 108 million. Geothermal energy projects were eligible for funding, however, only one was funded. Figure 3 (Left side) is a histogram of the co-funding awarded per project, with the orange bar showing the only geothermal project. As per the criteria, most awards were for NZD 5 million or less. One project received an award greater than this with a contribution of some $17.7 million. The project co-funding median was ~NZD 81,000.

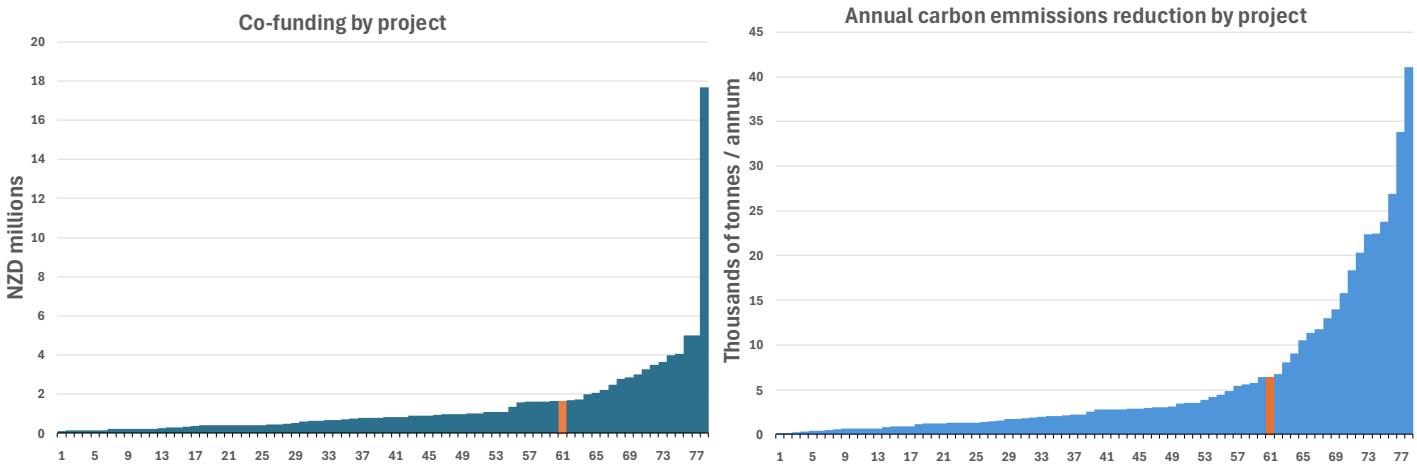


Figure 3: Histograms – Left GIDI co-funding by project, Right carbon emissions reductions by project. The orange column identifies the geothermal project.

The total annual carbon emission reductions estimated from the investment was 440,000 tonnes. The estimated maximum carbon emissions reduction for any given project was 41,000 tonnes per annum, the median for all the projects was 2640 tonnes per annum and the minimum was 150 tonnes per annum. The graph on the right in Figure 3 is a histogram of the annual emmissions reduction by project.

The only geothermal project to receive GIDI Fund support was a medium sized project (for projects supported by GIDI) at the Essity tissue manufacturing plant in Kawerau (orange column in Figure 3). The project is unique being the first paper machine in the world to have the yankee dryer heated using steam produced from geothermal energy replacing natural gas firing. The completed project cost was NZD 20 million (Tork 2025,) with EECA GIDI funding contributing NZD 1.65 million to the project with annual carbon emissions reduction estimated at 6450 tonne.

The project involved replacing the headbox, replacing gas heated hoods with steam heated hoods, installing a steel yankee drum and upgrading other equipment including the suction press roll. Figure 4 is a schematic that identifies the changes made to the paper machine.

In transitioning to geothermal energy from natural gas the hood temperature reduced from 350°C to 180°C. As well as the emissions reductions achieved from fuel switching, the rebuild reduced the annum pulp required by 1300 tons, reduced waste produced, improved the paper machine's efficiency and enlarged its product range capability. The rebuild paper machine was fully operational as of 3 March 2025 (Tork 2025).

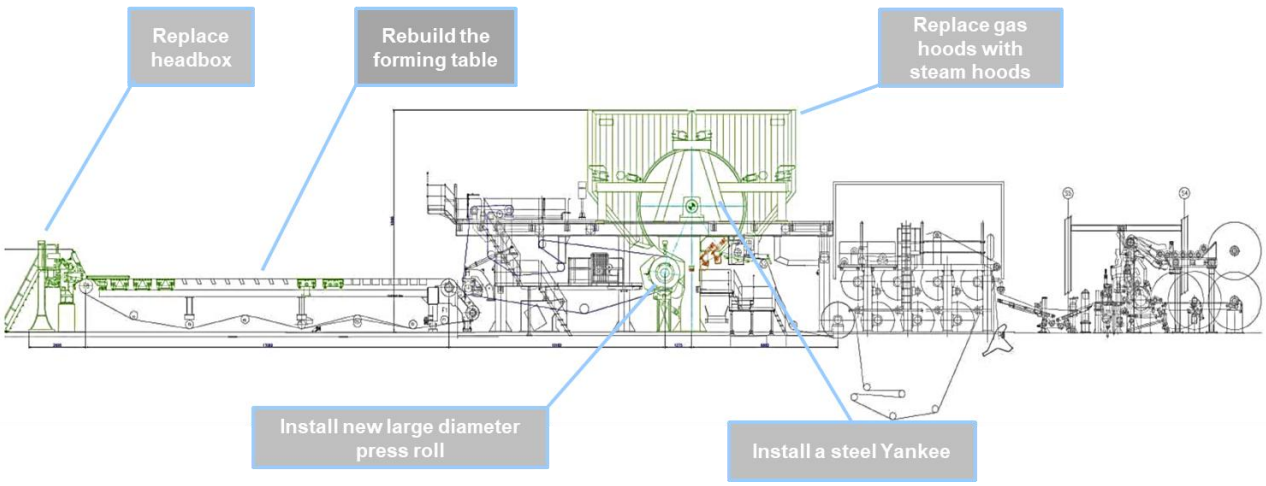


Figure 4: Essity Kawerau Paper Machine 3 rebuild schematic (Shepherd 2022). The components shown in green and identified by the grey text boxes were part of the rebuild.

3.2 Regional Energy Transition Accelerator Programme

The RETA (EECA 2025) programme driven by EECA aimed to develop an understanding of what energy supply is needed to decarbonise each region of New Zealand. The objective was to develop a well-informed and coordinated approach for regional decarbonisation by understanding unique region-specific opportunities and barriers in developing a region-by-region energy transition roadmap.

Earth Sciences New Zealand, Dobbie Engineers and GeoExchange under contract to EECA contributed geothermal assessments at several sites in the broader Bay of Plenty Region to the BOP RETA project (see Figure 5). The team completed five assessments, this included two sites (full energy conversion) and three applications (distinct parts of the energy use at a given site). The BOP RETA was the first RETA to assess geothermal energy opportunities in a given region.

The BOP Region has the full range of geothermal resources, from high temperature systems, such as at Kawerau and Taheke, to low temperature systems, such as in the broader Tauranga area and at Awakeri, and the near ambient temperature groundwater resources that are widely available across the BOP Region. It is known for its natural geothermal features such as hot springs, geysers and mud pools, and for different uses of geothermal energy and fluids, including therapeutic and recreational bathing, commercial and industrial process heat applications, and electricity generation.

The geothermal report (Carey et al 2024) introduces concepts and technologies in using geothermal energy for the supply of heat / cool and canvasses applicable regulatory regimes, including statutory aspects of geothermal greenhouse gas emissions as prescribed under the Climate Change Response Act 2002 and associated regulations. Analysis of the emissions regulations identified that significant emission reductions are potentially achievable through using geothermal rather than natural gas or coal. The emission reductions identified in Table 1 translate directly into reduced payments under the Emissions Trading Scheme with significant annual operational cost savings able to be achieved by using geothermal energy.

Table 1: Emissions data table for fossil fuels and geothermal energy. Regulatory data (grey cells) as of January 2025 from the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009, (SR 2009/285).

Type		tCO2e/t	Gj/t	tCO2e/GJ	Emissions Reduction per GJ compared to	
Coal	Sub-bituminous			0.09043	**Natural Gas**	**Coal**
Natural gas	National average			0.05553		
Geothermal						
Steam	Geothermal Steam (default)	0.03	2.78	0.01079	81%	88%
	Kawerau Industrial - Steam	0.0174	2.78	0.00626	89%	93%
Two Phase	Tauhara field	0.0009	1.2	0.00075	99%	99%
	Mokai field	0.0009	1.6	0.00056	99%	99%
Water	Geothermal Water	0	0.4	0	100%	100%

Potential greenhouse gas emissions reduction from using geothermal energy shown in Table 1 requires that the geothermal technology solution can meet the process temperature requirements.

Carey et al (2024) summarises the five assessments (locations in Figure 5) analysed for transitioning to geothermal energy from the 54 sites that EECA had information on in the BOP Region.

The geothermal solutions assessed in the BOP RETA are bespoke for each site, which is not an unusual characteristic for a geothermal energy assessment, because of the near unique combination of the available resource and the process application requirements.

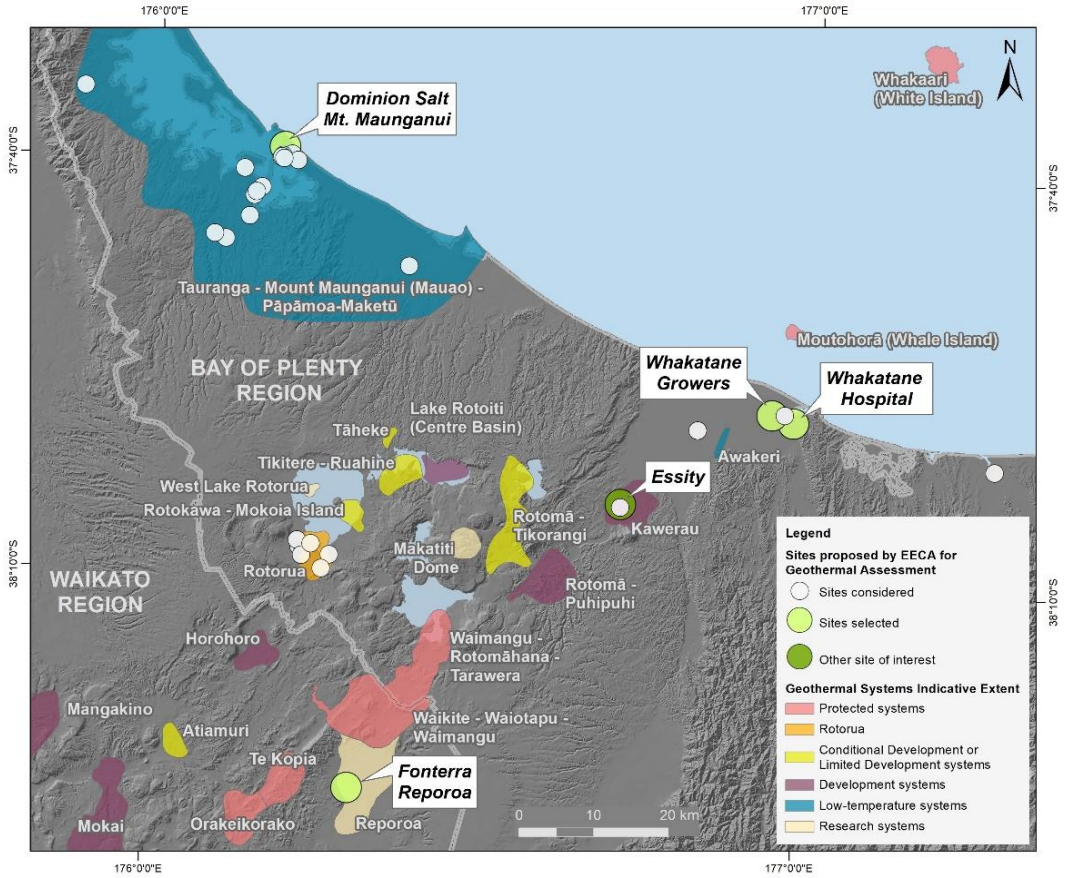


Figure 5: EECA RETA BOP sites (white circles) and the location of the sites / applications (light green circles) assessed for transitioning to geothermal by the geothermal project team (Earth Sciences New Zealand, GeoExchange and Dobbie Engineers). The darker green circle is a replication of the Essity paper machine rebuild discussed in Section 3.1.

The geothermal assessments study and the Marginal Abatement Cost (MAC) analysis subsequently undertaken by EECA identify that geothermal and Ground Source Heat Pump (GSHP) technologies have an important part to play in decarbonisation of the BOP Region. The EECA MAC (EECA 2024) analysis identified that geothermal was the optimum fuel for the facilities assessed as part of the BOP RETA project.

Importantly, GSHP technologies using ambient temperature groundwater can be applied widely across New Zealand, demonstrating that these technologies could have been included in all the RETA projects.

4 BOP GEOTHERMAL ASSESSMENT - SUMMARY INFORMATION

4.1 Two Site Assessments

Below is summary material from the Whakatane Growers and Whakatane Hospital site assessments undertaken by GeoExchange for transitioning the facilities from fossil energy to Geoheat (Carey et al 2024).

4.1.1 Whakatane Growers

This is a horticultural greenhouse facility with 3.2 hectares of covered area. The current energy delivery system uses a combination of coal and gas. The assessed maximum wintertime heating capacity is 4.8 MW_{th} to be supplied through Geothermal Heat Pumps using 15°C groundwater drawn from wells ~350m deep. The annual energy delivery to the facility is assessed at some 9300 MWh. An indicative capital requirement of NZD 6.6 million was estimated, with a simple payback of 2.4 years relative to an air source heat pump option. Annual CO_2e emissions reduction of 3700 tonnes (93%) was estimated relative to the current fossil fired system through adopting geothermal heating. The balance of the emissions come from the grid electricity used to run the systems.

4.1.2 Whakatane Hospital

The Whakatane Hospital is a 96 bed facility comprising both older and newer building stock. The current energy delivery system uses a combination of multiple gas boilers and split style air source heat pumps. The assessed capacity required for hot water is 200 kW, a maximum of 1900 kW for heating, and a maximum for cooling of 1200 kW. Annual energy for heating is assessed at 3700 MWh and for cooling 2300 MWh. Scenarios replacing the existing system with air source heat pumps and geothermal heat pumps were developed with the geothermal system using 15°C groundwater drawn from wells about ~100m deep. The geothermal system uses three abstraction and four injection wells. An indicative capital requirement of NZD 5.6 million was estimated for the geothermal system, which achieves a simple payback of 2.6 years relative to an all air source heat pump option. Annual CO_2e emissions reduction of 750 tonnes (89%) was estimated relative to the current fossil fired system. The balance of the emissions comes from the grid electricity used to run the geothermal system.

4.2 Benefit of Warmer Ground Water Temperatures

Even more can be achieved if the temperature of the aquifer water is naturally "elevated". The Whakatane Growers case study was modelled in new scenarios where the source water temperature increases up to 30°C, which reflects shallow temperatures found in places such as, but not limited to; some aquifers in the broader Tauranga area, in a number of areas of the Hauraki Plains, and at Parakai near Helensville, north of Auckland. Water at 30°C is expected to be encountered by drilling to 1000m in most parts of New Zealand.

A 15°C increase in aquifer water temperature results in a ~40% reduction in capital for an installation as less equipment is required, and a 44% reduction in the annual energy costs modelled for a 4.8 MW_{th} capacity Geoheat system supplying heat at 65°C (Table 2).

Table 2: Percentage energy savings with increasing source water temperature.

GSHP Source Temperature	System Coefficient of Performance (COP)	Energy Savings Relative to 15°C
15°C[1]	2.8	-
20°C	3.2	15%
25°C	3.6	29%
30°C	4.0	44%

[1] As per Whakatāne Growers site conditions.

4.3 The Three Applications

4.3.1 Dominion Salt - Mount Maunganui - Drying Application

Dominion Salt is an industrial facility in the Mount Maunganui area that uses steam from a cogeneration system to heat two fluidised bed salt dryers. The site consumes about 40% of the natural gas supplied to the local Mount Maunganui industrial area in the salt drying operation. Operating 24/7, the fluidised bed drying application at this plant was the focus of the geothermal assessment.

The only practical fuel / technology options for this application are natural gas as currently used, or transitioning to an electrically powered boiler or to a high temperature heat pump (HTHP) operating from a water source.

The Dominion Salt site overlies part of the Tauranga low temperature geothermal resource, with aquifer water temperatures of ~45°C at a depth of about 300 m. The drying application would require a 720 kW_{th} high temperature heat pump using the 45°C water source to generate 900 kg/hr of 120°C steam. The Waiteariki Ignimbrite aquifer unit was assessed capable of supplying 20 L/s of water at 45°C for this application with the fluid returned to the aquifer at 37°C. A HTHP with a COP of 2.8 was selected for the application. This heat pump requires 253 kW of electrical input.

The indicative capital cost estimate for an electric boiler for the application was NZD 0.7 million and the capital cost for the HTHP installation was NZD 5.2 million, which included the costs associated with accessing the aquifer water and wells to return the cooled fluid back to the aquifer. Table 3 identifies the annual emissions and annual energy required for the three fuel / technology types. The percentage reductions in energy and emissions relative to natural gas are also tabulated.

Compared to the other option of an electric boiler, the HTHP reduces the annual energy use by more than 16 TJ per annum (64%). The HTHP has a simple payback of ~4 years and substantially reduces the electrical load capacity required relative to an electric boiler.

The geothermal scenario for this steam raising application is estimated to reduce annual emissions by ~1400 tonnes CO_2e per annum (pa) compared to the natural gas fired system in use. This is a reduction of some 89%.

Table 3: Dominion Salt Drying Application – Technology options.

Technology Option	Conversion Factor	Energy		Emissions	
		TJ pa	% Reduction	tCO_2e pa	% Reduction
Natural gas boiler	0.85	28		1497	
Electric boiler	0.99	24	14%	493	67%
HTHP	2.8	8	70%	174	89%

4.3.2 Reporoa

The Reporoa Dairy Factory is located within / near the Reporoa geothermal field, which presents a potential opportunity for a geothermal energy supply. Reporoa is a high temperature geothermal system currently undeveloped and categorised as "research" under the Waikato Regional Plan. Additional scientific exploratory studies and drilling is required to further prove the resource ahead of a plan change that would then enable the system to be considered for energy production.

Dobbie Engineers undertook the investigation into the factory steam supply developing a bespoke design using two-phase geothermal fluid to provide energy to a pressurised process steam loop that delivers process steam some 1km to the dairy factory. A geothermal supply of 360 tonnes/hour of two-phase fluid at a pressure of 26 barg and an enthalpy of 1150 kJ/kg was the energy source for the two-phase geothermal to process steam generation plant located in the steamfield. The conceptual design minimised any possible risk of contamination from the geothermal fluids coming into contact with the food being processed. This was achieved by using a two-stage heat transfer process with geothermal fluid first used to generate "process steam" in the steam field. This "process steam" is then piped to the factory site where "culinary grade steam" is generated in a reboiler plant. Up to 36 tonnes per hour of culinary grade steam at 14 barg (198°C) generated from the geothermal energy replaces all the natural gas generated steam in the factory. Other process applications in the factory that utilised natural gas were to remain using natural gas due to the expected complexity and cost of transitioning these to geothermal.

The capital costs for the surface plant and piping systems was estimated at $24 million with annual plant operational/maintenance costs of $1.5 million. Earth Sciences New Zealand estimated that an additional $24 million should be allocated for production and injection wells in the steamfield.

The estimated annual CO_2e emissions reduction was 15,000 tonnes. This shows a 93% reduction for the geothermal application replacing all the natural gas generated steam at the factory. Overall transitioning this application to geothermal reduces the site emissions by 68% and at a carbon price of NZD 60 per tonne an annual saving of NZD 900,000 is achievable.

4.3.3 Essity Paper Machine Replication Project

An opportunity exists at the Essity Kawerau Tissue Manufacturing plant to replicate the paper machine 3 geothermal conversion on a second, as yet unconverted, paper machine. The information for this replication was derived from the EECA GIDI funded project discussed in Section 3.1. The cost of the conversion is updated to NZD 20 million (Tork 2025) for a further reduction in of 6450 tonnes of carbon equivalent per annum.

4.3.4 BOP RETA Geothermal Project Transition Summary

Table 4 tabulates summary data for the geothermal assessments undertaken as part of the EECA BOP RETA.

Table 4: BOP RETA geothermal technology scenarios - site and application data.

Site	Geothermal options capital investment	CO_2e pa eliminated	Net Emissions reduction
	(NZD million)	(tonnes)	(%)
Whakatāne Hospital	5.6	750	89
Whakatāne Growers	6.6	3,400	93
Dominion Salt HTHP steam application	5.2	1,300	89
Reporoa Dairy Factory steam application	70[1]	15,900	93
Essity Paper Machine Conversion	20	6,450	n/d

n/d – not determined

[1] Includes budgetary estimates for the cost for the exploratory and plan change work

5 IMPACT OF GOVERNMENT LED GEOTHERMAL INITIATIVES

The GIDI grant towards the geothermal project at Essity, the inclusion of a geothermal workstream in the BOP RETA and other activities seeking to raise awareness of Geoheat opportunities has generated greater awareness of the role that geothermal can play in the nationwide energy transition. As a result of this some promising developments for industry have subseqently eventuated.

5.1 Geoheat Potential of the Tauranga Geothermal System

Following the release of the BOP RETA the Bay of Plenty Regional Council (BOPRC) commissioned a comprehensive investigation into the Geoheat potential of the Tauranga Geothermal System (TGS) (GeoExchange, 2024). The purpose of the investigation was to understand the opportunity for greater use of the resource in this rapidly growing region in the Western Bay of Plenty, also importantly, how to manage the resource sustainably with increased use. One of the findings of the report was that public awareness of the potential end uses of the resource is limited, and that greater public education is required. The investigation is now public and it has been used to inform broader stakeholder consultation.

Further work has been undertaken by the BOPRC with public consultation associated with a proposed revision of the Tauranga System Management Plan (SMP). The revision of the SMP includes amendments to the resource consenting process to facilitate more Geoheat use within sustainable parameters.

The combined work of the BOP RETA and the GeoExchange (2024) report on the TGS has helped raise awareness of the geothermal potential in the western BOP region, as evidenced by the inclusion of geothermal in Priority One's (regional economic development agency) 2025 Regional Energy Strategy.

5.2 Geoheat Business Guide in Aotearoa New Zealand

Recognising that utilisation of geothermal energy in NZ is not well understood beyond its role in electricity generation, EECA and NZGA commissioned a Geoheat Business Guide (NZGA-EECA 2025) which introduces the range of technologies for using geothermal heat and a guide to assist in permitting these technologies under the RMA. The guide was released July 2025.

6 CONCLUDING OBSERVATIONS

Geothermal energy, from ambient to high temperature sources, has a significant contribution to make to New Zealand's 2050 net zero energy transition.

Ambient and low temperature geothermal energy is available widely across New Zealand being able to provide low carbon energy to facilities such as greenhouses, hospitals and even for 120°C steam raising applications such as at Dominion Salt using appropriate heat pump technology.

There are benefits to be derived if geothermally enhanced aquifer water with temperatures of 30°C or greater is accessible where a geothermal heat pump / GSHP design can provide a 44% reduction in annual energy usage compared with a 15°C GSHP ambient aquifer water design, in supplying energy at 65°C for instance to a greenhouse.

Transitioning or using geothermal energy has the potential to achieve operational greenhouse gas emission reductions of between 80% to 100% relative to natural gas or coal, with the proviso that the geothermal technology design enables meeting the temperature requirements of the application.

It is certain that a geothermal solution can meet a substantial part of a facilities energy requirements even if the solution cannot attain the higher temperatures that might be required for some process applications at the facility. Heat pump technology is developing rapidly, and high temperature heat pumps are currently achieving delivery temperatures of 160°C. Heat pumps delivering energy at up to 300 °C are expected to be available by 2030 (Richter 2025).

When the grid electricity to run a process is included, emission reductions of 89 to 93% have been estimated as part of the EECA BOP RETA. As grid electricity in New Zealand is generated from more renewable and lower carbon energy sources in the future the estimated emission reductions associated with the geothermal solutions will further increase.

Central and local government support for demonstrating Geoheat potential in New Zealand initiated through the Essity demonstration and BOP RETA is gaining momentum, particularly in the Bay of Plenty. This highlights the significant role government backing plays in advancing these opportunities.

Geothermal energy awaits, as a low carbon energy opportunity to be developed in all regions of New Zealand.

REFERENCES

Carey BS, Alcaraz SA, Wells C, Carden Y, Moore G. 2024. Regional Energy Transition Accelerator – Bay of Plenty – Geothermal Energy Assessment. Lower Hutt (NZ): GNS Science. 74 p. (GNS Science Report; 2024/02).

Climo, M., Bendall, S., Carey, B., 2017. Geoheat Strategy for Aotearoa NZ, 2017–2030. New Zealand Geothermal Association. ISBN 978-0-473-38263-6. (2017). https://www.nzgeothermal.org.nz/downloads/Geoheat_Strategy_2017-2030__Web_Res_.pdf

EECA, 2024. Regional Energy Transition Accelerator (RETA) Bay of Plenty Summary Report. https://www.eeca.govt.nz/assets/EECA-Resources/Co-funding/RETA-Bay-of-Plenty-Summary-Report.pdf

EECA, 2025. Regional Energy Transition Accelerator. EECA. https://www.eeca.govt.nz/co-funding-and-support/products/about-reta/

Shepherd, I., 2022. Tissue and Towel with Geothermal Steam. Essity presentation to Bay of Connections Seminar Decarbonising Industry through Geoheat held at Toi Ohomai Institute of Technology, Rotorua, 26th July 2022.

MfE, 2023. National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat 2023. https://environment.govt.nz/assets/publications/climate-change/National-Policy-Statement-for-Greenhouse-Gas-Emissions-from-Industrial-Process-Heat-2023.pdf

NZGA-EECA, 2025, Geoheat Business Guide in Aotearoa New Zealand: Navigating Technology Options & Resource Management. https://www.nzgeothermal.org.nz/downloads/Geoheat-Business-Guide-2025.pdf

RMR, 2023. Resource Management (National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat) Regulations 2023. https://www.legislation.govt.nz/regulation/public/2023/0165/latest/LMS605249.html

Richter, M. 2025. 2024 Country Report – Germany. July 2025 IEA Geothermal Report. https://drive.google.com/file/d/1UISdfIVgF2CJ2lp8rUxM1ZgjyzJA7SP9/view

Tork, 2025. World-first tissue machine operating on geothermal steam is unveiled today at Essity's Kawerau paper mill. 12 March 2025 media article. https://www.tork.co.nz/press-releases/kawerau-update-march-2025