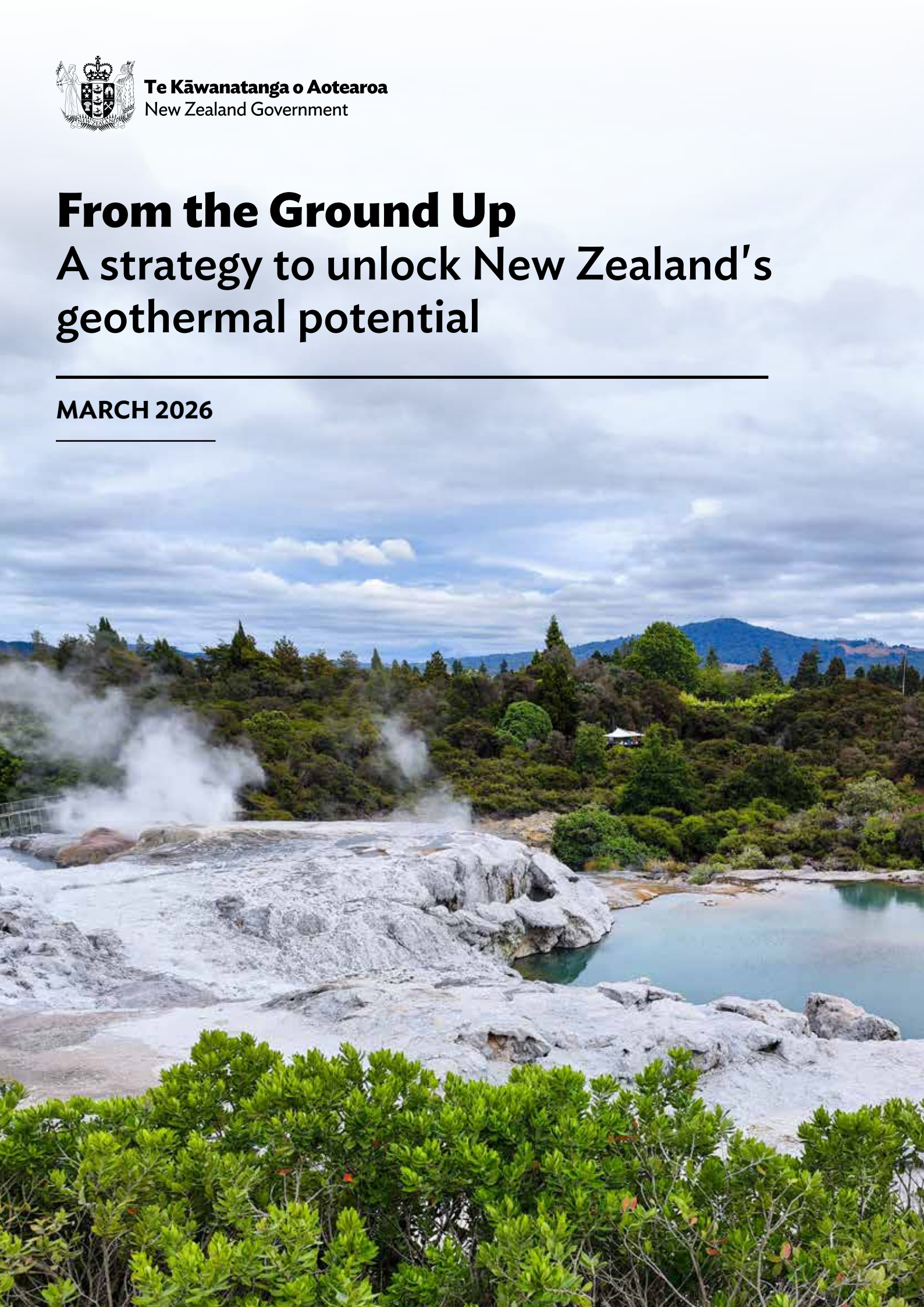
Te Kāwanatanga o Aotearoa
New Zealand Government

From the Ground Up

A strategy to unlock New Zealand's geothermal potential

MARCH 2026



MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Ministry of Business, Innovation and Employment (MBIE)
Hīkina Whakatutuki – Lifting to make successful

MBIE develops and delivers policy, services, advice and regulation to support economic growth and the prosperity and wellbeing of New Zealanders.

More information

Information, examples and answers to your questions about the topics covered here can be found on our website: **mbie.govt.nz**

ISBN: (online): 978-1-997308-05-8 **ISBN: (print): 978-1-997308-06-5**

MARCH 2026

Cover image:
View at Geothermal Valley at Te Puia in Rotorua (image sourced from Shutterstock.com)

Contents

Ngāwhā Geothermal Power Station in Northland (image supplied by Top Energy)

Minister's foreword

New Zealand has long relied on the strength of the resources beneath our feet. Geothermal energy is one of those rare national advantages — dependable, innovative and capable of powering real economic momentum.

From the Ground Up – a strategy to unlock New Zealand's geothermal potential reflects the feedback the Government received on the draft and sharpens our focus on what matters: accelerating development, improving investment confidence and ensuring regulatory settings support progress rather than curtail it. Across the wider Resources portfolio we are already seeing stronger investment pipelines and faster approvals, a sign of renewed confidence in this valuable sector.

The action plan emphasises practical delivery and aligns the strategy with the Government's broader economic direction — driving regional prosperity, enabling infrastructure and getting New Zealand's engines of growth cranking.

Geothermal is bigger than just electricity generation. This strategy lays out a pathway for expanding industrial heat use, supporting new technology trials and opening the door to emerging opportunities such as next-generation geothermal systems and deeper exploration. These developments can reduce energy costs for businesses, boost productivity and support year-round energy resilience.

Regional development and prosperity are core priorities for this Government, and geothermal is a natural fit. Harnessing our geothermal advantage can boost jobs, investment, industrial expansion and tourism in regional New Zealand. This strategy strengthens those opportunities by improving access to data, reducing early-stage risk for developers and encouraging growth hubs that align local demand with proven heat and power resources.

This strategy sets out a clear and achievable pathway to double geothermal energy use by 2040, modernise outdated regulatory settings and build the scientific and technical capability necessary for long-term growth.

New Zealand has the chance to lead the world in how we use geothermal energy, supporting a resilient, modern and productive economy. With this strategy in place, we are backing that potential and setting the conditions for continued investment, innovation and regional success.

Hon Shane Jones
Minister for Resources

Strategy at a glance

A focused pathway to geothermal leadership and sustainable growth.

OUR VISION:
New Zealand is a global leader in sustainable geothermal development, delivering innovation, resilience and inclusive growth for future generations.

OUR OUTCOMES:

OUTCOME 1:
Extend New Zealand's position as a world leader in geothermal **innovation and sustainability.**


Image: Shutterstock.com

OUTCOME 2:
Support **energy resilience** by maintaining and accelerating increased renewable electricity generation and harnessing geothermal heat to support New Zealand's energy transition.

GOAL: Double geothermal energy use[1] by 2040


Image: Mercury New Zealand (photo credit: Stephen Wells)

OUTCOME 3:
Strengthen **regional economies and te Ōhanga Māori** by advancing sustainable geothermal development in partnership with tāngata whenua, and unlock industrial growth, tourism and trade to support New Zealand's goal of doubling exports.


Image: Shutterstock.com

OUTCOME 4:
Recognise and support the aspirations of iwi and hapū for the sustainable management, development and protection of geothermal resources, using the **Treaty of Waitangi as a guiding principle** and in a way that upholds the Treaty and Treaty settlements and commitments.


Image: Shutterstock.com

ACTION PLAN GOALS:

- Improve access to geothermal data and funding to enable development.
- Ensure regulatory and system settings are fit-for-purpose.
- Advance knowledge and uptake of existing geothermal technologies and geoheat opportunities.
- Enable place-based geothermal clusters.
- Drive geothermal science, research and innovation, including next-generation technologies.

1 This includes both conventional geothermal electricity production and lower enthalpy geothermal/geoheat opportunities.

What is geothermal and how is it important to New Zealand?

Our unique geology provides New Zealand with an extraordinary opportunity to harness a powerful and versatile natural resource with diverse applications. Stunning vistas showcasing precious geothermal surface features, combined with early innovation in energy development, laid the foundation for New Zealand's energy profile and propelled us forward as a global leader.

A long used taonga

Geothermal fluid, or waiwhatu (derived from the te reo Māori words wai (water, fluid) and whatu (stone, core) to mean 'fluid from the core'),[2] is considered a living entity and a taonga by tāngata whenua. Geothermal sites hold particular cultural and spiritual significance for Māori as the places where the physical and spiritual worlds meet and are woven through the whakapapa and pūrākau (myth, ancient legend) of many iwi and hapū. Māori have used geothermal features for cooking, bathing, therapeutic and heating purposes for centuries. Māori have also utilised geothermal features for tourism business and other development purposes, carried out in accordance with tikanga (customs, traditional values). These uses are still practiced today.

Geothermal energy comes from deep within the Earth's crust, where magma (tokarewa)[3] heats surrounding rocks and water to extremely high temperatures in reservoirs (māpuna)[4] deep underground. The water and steam from geothermal reservoirs can rise to the surface, causing geysers, hot springs (ngāwhā), boiling mud pools and sinter terraces.[5] New Zealand has many globally significant geothermal surface features which are phenomenal tourism attractions and notable contributors to export earnings and regional economies.

New Zealand's geographic location gives us a unique geothermal advantage. Particularly in the Taupō Volcanic Zone (TVZ), the Earth's crust has stretched and thinned, allowing us to access significant geothermal resources and heat at much shallower depths.

In 2024, 27.5 per cent of international visitors reported experiencing a geothermal attraction while in New Zealand.[6]

A surge in development

Modern geothermal development in New Zealand began in the 1950s. A Crown-led explorative drilling programme between 1949 and 1986 jumpstarted our understanding of the geothermal fields in the TVZ and at Ngāwhā in Northland. This work established the potential for electricity generation in these areas, utilising geothermal steam to power turbines.

2 The Waiwhatu Project developed six te reo Māori kupu (words) to describe geothermal terms. More detail about this project and the other words can be found here: **www.geothermalnextgeneration.com/updates/waiwhatu-project-developing-shared-language**
3 A word developed by the Waiwhatu Project from the te reo Māori words toka (rock) and rewa (to melt, to become liquid).
4 A word developed by the Waiwhatu Project from the te reo Māori word māpuna, meaning 'to well up, to form a pool'.
5 Sinter terraces are silica deposits formed as silica precipitates out of geothermal fluid as it cools. The most famous sinter deposits were the Pink and White Terraces which were destroyed in the eruption of Mount Tarawera in 1886.
6 From the Ministry of Business, Innovation and Employment's (MBIE's) 2024 International Visitor Survey.

New Zealand's first, and the world's second, geothermal power station was Wairākei, just outside Taupō, which first generated electricity in 1958. It is still operating nearly 70 years later and is now one of 17 geothermal power plants across eight geothermal fields – delivering a combined generation capacity of over 1,200 MW.[7] Unlike wind and solar, geothermal energy is consistently available.[8]

In 2024, geothermal accounted for 8,741 GWh, or nearly one-fifth of New Zealand's annual electricity generation.[9]

Lessons from the past

Not all geothermal development has had a positive impact. This strategy acknowledges the damaging environmental effects, including land subsidence and the loss of many high-value and culturally significant surface features such as geysers, that occurred at Wairākei as a direct result of the development of the Wairākei geothermal power station. Over-extraction of the Rotorua geothermal system in the 1960s and 1970s led to depletion of geysers and other surface features. Regional councils, together with input and mātauranga from local iwi and hapū, have taken the lessons from the past and helped to create strong consenting processes to support the sustainable development of geothermal resources.

Partnering with tāngata whenua is an integral component of geothermal development, bringing a rich blend of economic insight, Māori development priorities and values to the forefront. This partnership enables Māori, as kaitiaki, to actively shape the future and catalyse innovation across the industry.

Tourists take in the Steaming Cliffs at Hell's Gate at Tikitere, near Rotorua (image supplied by Hell's Gate; photo credit: Miles Holden)

7 Capacity figure from Transpower's '2025 SOSA – Final Supplementary Data – Final Version' document which can be accessed here: **www.transpower.co.nz/invitation-comment-security-supply-assessment-2025-closed**
8 Geothermal power stations are occasionally shut down for periods of maintenance or upgrades.
9 From MBIE's 'Data tables for electricity' which can be accessed here: **www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/electricity-statistics**

CASE STUDY 1:

Decarbonising the covered crop industry

Innovative projects supported by the Ministry for Primary Industries' Sustainable Food and Fibre Futures Fund (SFFF Fund)* are exploring ways to replace fossil fuels with renewable geothermal inputs. These projects seek to address key barriers to decarbonisation in horticulture while enhancing energy and food security.

The Geothermal Food Systems project led by Upflow in collaboration with Tauhara North No.2 Trust integrates geothermal heat, electricity and CO_2 capture to create a low-carbon, self-sufficient growing environment for glasshouses. This initiative is progressing towards a demonstration-scale deployment to validate and optimise this innovative technology package for wider use across New Zealand.

Earth Sciences New Zealand, Vegetables NZ, Tomatoes NZ and GeoExchange NZ are working together to develop a web-based tool that translates complex subsurface data into accessible insights. This tool will help greenhouse growers in Auckland, Waikato and Bay of Plenty assess and adopt low-temperature geothermal heating to support the horticulture sector's shift away from fossil fuels toward 24/7 renewable energy.

* The SFFF Fund has been replaced by the Ministry for Primary Industries' Primary Sector Growth Fund.

Image: Eugene Golovesov, Unsplash.com

Beyond electricity generation – the geoheat opportunity

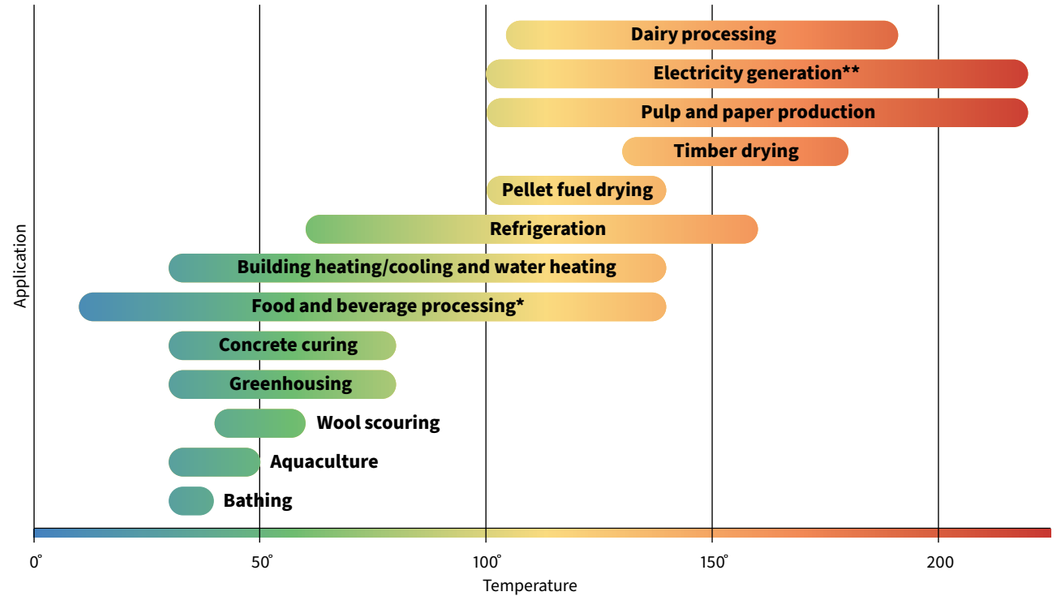
The potential of our geothermal resources does not end at electricity generation. In Kawerau and Taupō, renewable geothermal heat and steam powers industrial processes, such as timber drying and tissue manufacturing. In 2024, direct use of geothermal energy (across industrial, agricultural, commercial and residential sectors) amounted to 7.38 PJ, with an additional 0.56 PJ[10] used for co-generation.[11]

The full spectrum of geothermal heat can be used in a variety of applications – including bathing, aquaculture, horticulture and heating for water and buildings (see Figure 1). This strategy seeks to incorporate all these opportunities, including electricity generation and geothermal and non-geothermal direct heat use, and uses the term **'geoheat'** to capture these wider applications.[12]

10 Direct use figure from MBIE's 'Energy balance tables' spreadsheet which can be accessed here: **www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/energy-balances**

11 Co-generation means the use of geothermal energy to generate both electricity and heat.

12 The *Resource Management Act 1991* refers to geothermal as including geothermal energy derived from and produced within the Earth (e.g. from hot rock deep in the Earth) and 'geothermal water' as water heated within the Earth to a temperature of 30 °C or more. This resource can be used directly (e.g. for warm pool water or for space heating) or for electricity generation. In some cases, heat pumps are used to elevate (or reduce) temperatures to match the end use. This can include situations where the temperature of the energy source is less than 30 °C so is not technically considered geothermal (e.g. water that is 27 °C) or where ground source heat pumps use ambient heat from the ground for both heating and cooling. 'Geoheat' is a term used to encompass all of these applications.



Note:
*This includes honey and meat processing, and fruit and vegetable dehydration
** This is the turbine inlet temperature range

Figure 1: Examples of uses across the geothermal heat spectrum (underlying data provided by Earth Sciences New Zealand)

CASE STUDY 2:

Beyond heat and steam – innovative resource recovery from geothermal fluids

Ground-breaking science and innovation pioneered in New Zealand is enabling greater value to be recovered from New Zealand's geothermal resources. The novel Biofeedstocks project, delivered by Upflow and co-funded by Tauhara North No.2 Trust and the SFFF Fund, is pioneering the use of geothermal waste gases (CO_2 and methane) and microorganisms to produce high-protein biomass, with potential applications in animal feed, human nutrition and high-value bioproducts.

Contact Energy are actively exploring capturing and refining geothermal CO_2 from Ohaaki geothermal power station near Taupō to produce food-grade CO_2 for the food and beverage industry.

Image: Te Huka Geothermal Power Station (supplied by Contact Energy)

Unleashing subsurface value

Beneath the surface lies further commercial potential – from extracting the valuable minerals in geothermal fluids to capturing geothermal CO_2 for various commercial uses to pioneering biotechnology that leverages the stability of geothermal extremophiles, microorganisms that thrive in very hot and acidic environments.

These innovations open new economic pathways and position geothermal as a source of scientific advancement, environmental stewardship and industry transformation, while also unlocking opportunities to export the intellectual property (IP) generated by these discoveries.

Powering partnerships – geothermal collaboration across borders

New Zealand's geothermal expertise is recognised globally, contributing to renewable energy development and building sector capability worldwide. Strategic partnerships with countries such as the United States, Japan and Iceland strengthen trade relationships and provide access to international technology and expertise, supporting the next phase of geothermal advancement.

Cooperation agreements with the Philippines and Indonesia enable New Zealand's commercial sector to access new markets and support global renewable energy ambitions through technical assistance and capacity building. New Zealand also works with regional institutions in Africa and the Caribbean to help develop geothermal sectors in these regions.

CASE STUDY 3:

From challenge to commodity

Geo40 and CaSil Technologies have developed innovative processes and technologies to address the world-wide problem of silica deposition that affects geothermal resource utilisation by blocking pipes and reinjection wells, leading to decreased well lifespan and power station energy efficiency. Geo40 recovers valuable colloidal silica at full commercial scale from geothermal fluids at Ohaaki power station, improving the utilisation of geothermal heat while also unlocking new revenue streams by selling the captured high-quality geothermal colloidal silica nanoparticle for use in a myriad of applications. Geo40 is also developing technology that will create low-carbon, sustainable sources of globally strategic minerals from geothermal fluids, including lithium, boron and caesium.

CaSil Technologies, supported by the Ministry of Business, Innovation and Employment's Endeavour Fund, has developed technology to rapidly capture the silica from geothermal fluids and transform it into a nanostructured calcium silicate (CaSil) material with novel applications as a smart fertiliser. The technology has been successfully demonstrated at pilot plant scale operations in four New Zealand geothermal power stations.

Image: Wai-O-Tapu Thermal Wonderland, Rotorua, Shutterstock.com

CASE STUDY 4:

A world leader in geothermal research and training

New Zealand is driving international geothermal innovation and capability building as a global leader in geothermal energy and science. The Geothermal Institute at the University of Auckland is a world-leader in geothermal education, engineering and reservoir modelling. The Institute consults on commercial geothermal projects in over 40 countries and has trained over 2,000 energy professionals worldwide since 1978 through specialised post-graduate programmes and professional training.

Government-funded research programmes led by Earth Sciences New Zealand (ESNZ) have spearheaded New Zealand's bold ambitions in supercritical/superhot geothermal exploration, while continuing to develop our understanding of New Zealand's low enthalpy and conventional geothermal resources. ESNZ's geothermal expertise has supported the global geothermal industry for over 50 years.

Image: Tauhara Geothermal Power Station (supplied by Contact Energy)

Sustainable development

Advances in reinjection technology are enhancing the sustainability profile of geothermal energy. In addition to being reliable and renewable, geothermal can now offer low-carbon electricity generation, as the naturally occurring greenhouse gases in geothermal fluids can in some cases be returned to the reservoirs or alternatively captured for use in secondary applications, rather than released to the atmosphere.

Supercritical/superhot geothermal – the next frontier

New Zealand's conventional geothermal reservoirs (up to 350 °C and located between 1 km and 3.5 km deep) have long powered renewable energy, but the next chapter lies deeper – within the largely unexplored realm of supercritical/superhot geothermal fluids.[13] In the TVZ, our unique geology and thinner crust offer a rare opportunity to access geothermal fluids at depths beyond 5 km and temperatures exceeding 400 °C. These supercritical/superhot resources could deliver up to three times more energy than conventional systems.[14]

Backed by government investment, this bold exploration into uncharted subsurface territory could redefine our energy future and reinforce New Zealand's global leadership in geothermal innovation.

13 The term 'supercritical geothermal' describes a thermodynamic state of geothermal fluid at depth, where the fluid is neither a liquid nor a gas. This requires temperatures of greater than 375 °C and pressures of greater than 22 MPa. Internationally, the term 'superhot' is often used colloquially to refer to the same concept so has been included in this document alongside 'supercritical'.

14 **www.gns.cri.nz/news/is-the-superhot-energy-solution-beneath-our-feet/**

Rotokawa Geothermal Field (image supplied by Mercury New Zealand; photo credit: Stephen Wells)

Acknowledgement of Treaty and Treaty settlement obligations regarding geothermal resources

Geothermal resources are taonga of immeasurable cultural, spiritual, economic and historical significance to tāngata whenua. This strategy is developed in a context where iwi and hapū have rights and interests in geothermal resources and statutory acknowledgements in Treaty settlement legislation affirm the enduring significance of these taonga.

The Government, through this strategy, is committed to recognising and supporting the aspirations of iwi and hapū for the sustainable management, development and protection of geothermal resources. In doing so, the strategy seeks to uphold the Treaty and outcomes of Treaty settlements and to provide a pathway for ongoing partnership, meaningful engagement and shared benefit with tāngata whenua.

The strategy itself is intended to provide a coordinated framework and long-term vision for utilising the potential of New Zealand's geothermal resources. There has been proactive engagement with iwi, hapū, and Māori organisations throughout the development of the strategy. Any future work to give effect to the strategy, including the development of new or amended policies, regulations or operational practices, will be undertaken through further policy processes. These processes will include consultation with iwi, hapū and sector participants as appropriate, and will ensure they have the opportunity to provide input on substantive policy proposals.

Acknowledgement of the ongoing Waitangi Tribunal inquiry (Wai 2358)

This strategy has also been developed in a context where the National Freshwater and Geothermal Resources kaupapa inquiry (Wai 2358), which began in 2012, is ongoing. We acknowledge this process and the perspectives being shared with the Waitangi Tribunal, including those on the draft strategy. As the Wai 2358 process continues, the Tribunal's reporting will be considered as it is released.

Pōhutu Geyser is located in the Whakarewarewa Geothermal Valley, Rotorua. The geyser is the largest in the southern hemisphere and among the most active in the area, erupting up to 20 times per day at heights of up to 30 metres. (image supplied by Te Puia – tepuia.com)

Geothermal and geoheat utilisation across New Zealand

Here are some examples of geothermal and geoheat development and innovation across the motu.

The map opposite shows surface heat flow across New Zealand. Surface heat flow measures how much heat from within the Earth is transferred to the ground surface. Along with the thermal properties of rocks and soils, it is influenced by how quickly temperature increases with depth below the surface. Areas with low surface heat flow are blue, and areas with high surface heat flow appear as red.

1. The Ngāwhā geothermal reservoir enables both tourism and energy security in the Far North by feeding the Ngāwhā Springs mineral hot pools and Top Energy's Ngāwhā geothermal power station (57 MW). Notably, this is the first power station in New Zealand to achieve net carbon zero status due to 100 % reinjection of CO_2-containing gases into the Ngāwhā geothermal reservoir.

2. The Coromandel peninsula contains several small geothermal systems which feed popular tourist attractions such as the Lost Spring hot pools in Whitianga and Hot Water Beach.

3. A research project led by the University of Auckland's Geothermal Institute is exploring how underground temperatures can be harnessed to reduce water heating costs in Auckland.

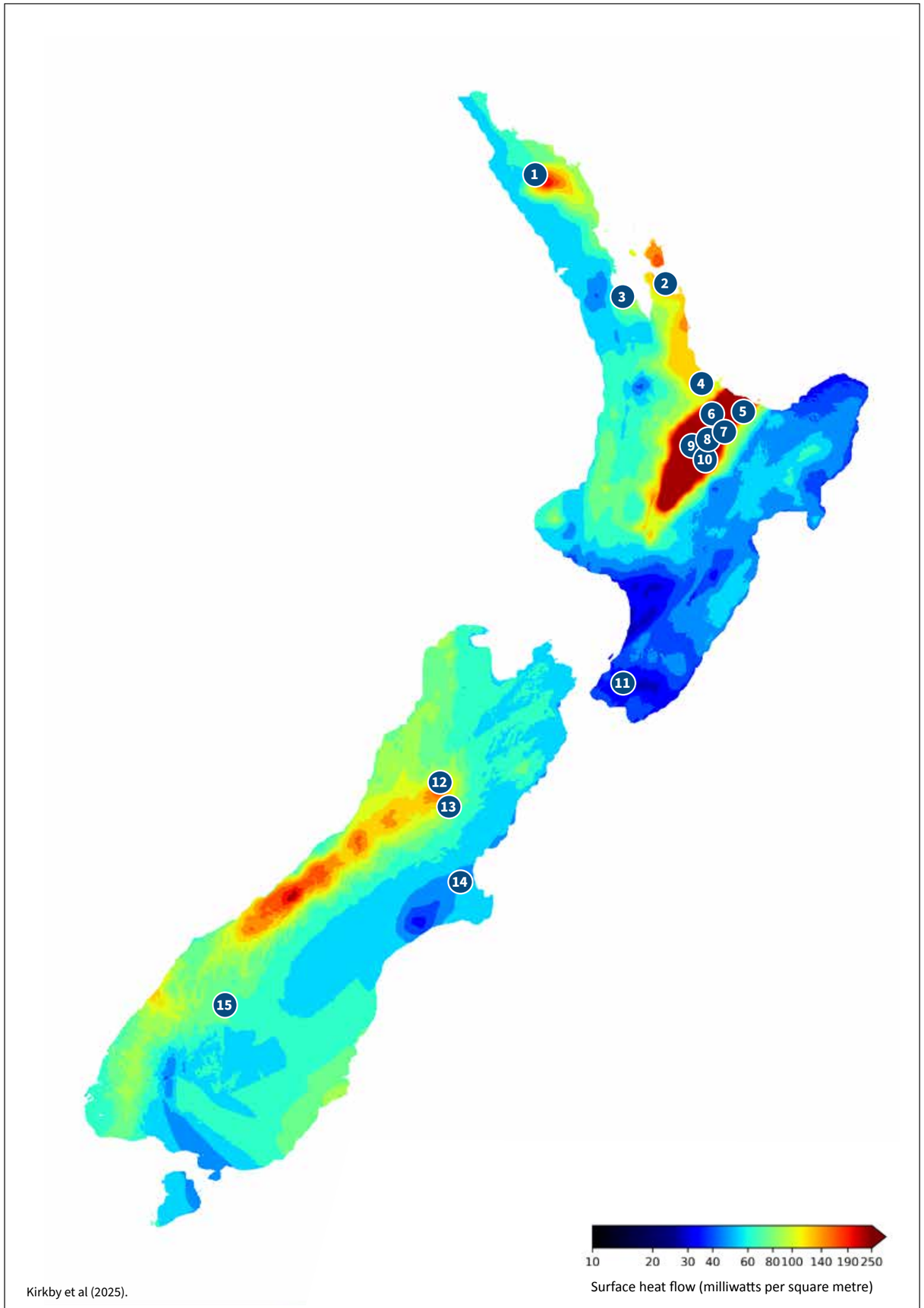
4 to 10 Take a closer look at the Taupō Volcanic Zone over the page.

11. Lower Hutt City Council's administration building is heated by ground source heat pumps, integrated into the building's structural piles.

12–13. Maruia Hot Springs and Hanmer Springs thermal pools are popular geothermal spa and wellness experiences in the South Island.

14. Numerous buildings in Christchurch, including Christchurch Airport, Tūranga central library, Environment Canterbury offices, and several University of Canterbury lecture theatres are heated by water bore and ground source heat pump technology.

15. Tewa Banks is a 68-home development in Arrowtown for the Queenstown Lakes Community Housing Trust. The homes are connected to a networked ground source heat pump system, providing affordable heating and hot water.



Kirkby et al (2025).

Geothermal activity in the Taupō Volcanic Zone

4 EECA's Regional Energy Transition Accelerator (RETA) report specifically highlighted the potential of Tauranga's low heat geothermal system for businesses and primary industries looking to decarbonise.

5 Ngati Tuwharetoa Geothermal Assets supplies geothermal steam and brine to a variety of industrial customers in Kawerau, including Eastland Generation's TOPP1 and TOPP2 geothermal power stations and the Essity paper mill, which has installed the world's first 100 % geothermal tissue-drying machine. Opened in early 2026, TOPP2 (49 MW) is New Zealand's newest geothermal power station.

6 Rotorua Hospital and several council buildings utilise geothermal heating systems.

World-class geothermal tourism attractions in the Rotorua district, often showcasing both geothermal wonders and Māori culture, include Whakarewarewa Living Māori Village, Hell's Gate, Wai-O-Tapu and Te Puia. Pōhutu, the largest geyser in the southern hemisphere, erupts up to 20 times a day, shooting geothermal water up to 30 metres into the air.

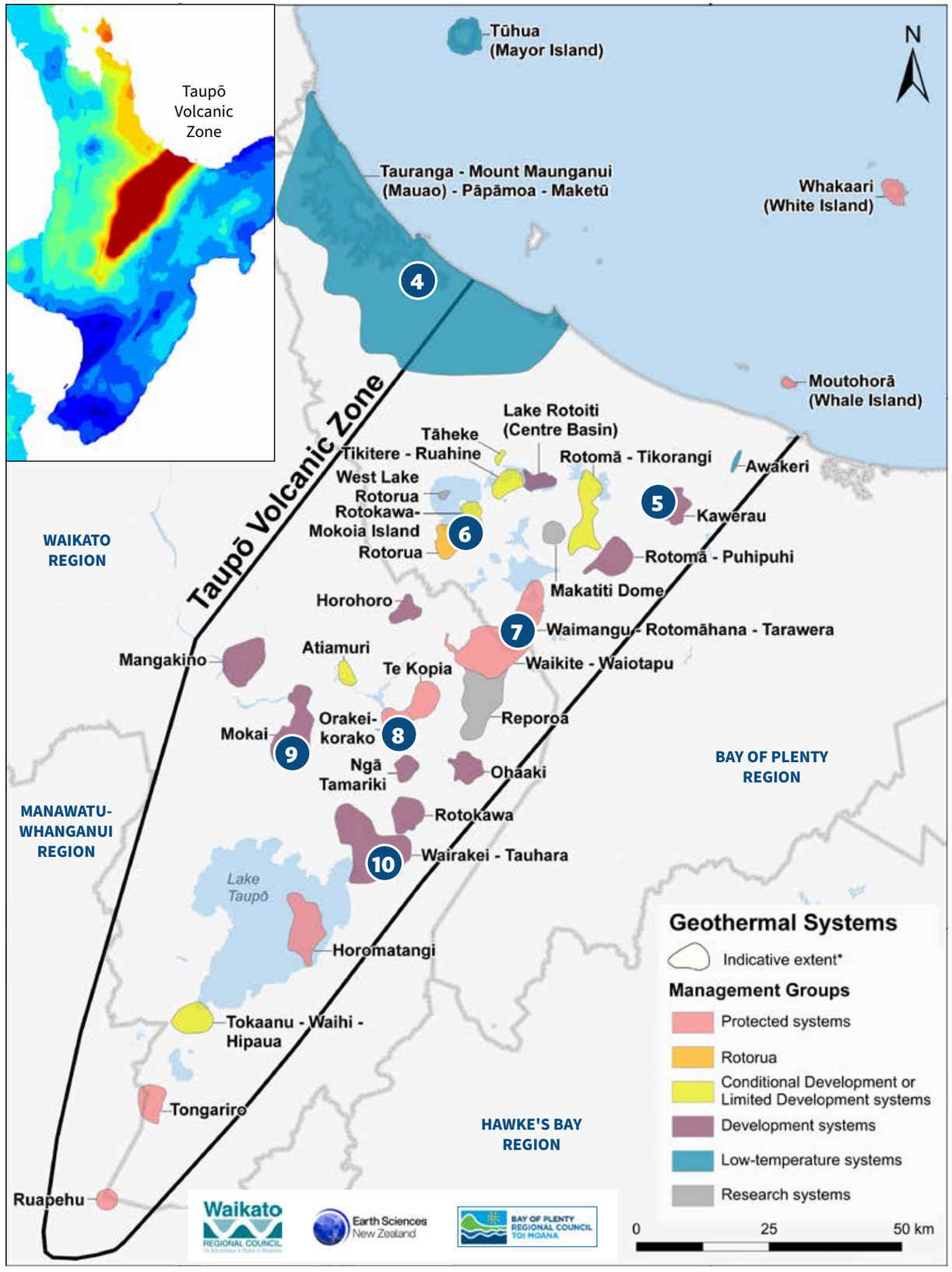
7 Waimangu Volcanic Valley contains several globally-significant geothermal surface features, including the brilliant blue Inferno Crater and Frying Pan Lake (one of the world's largest hot springs).

8 Orakei Korako is New Zealand's largest geyser field, even despite the tragic loss of more than 250 hot springs and geysers that occurred during the formation of Lake Ohakuri for the Waikato River hydro-electric power scheme in 1961. Orakei Korako highlights the vibrant colours of geothermal landscapes due to the presence of colourful algae which grow in the warm temperatures of geothermal waters. Orakei Korako also contains New Zealand's only geothermal cave and what are believed to be the largest naturally fault-stepped silica terraces since the destruction of the Pink and White Terraces in 1886.

9 Tūaropaki, an ahu whenua trust, has developed one of New Zealand's most advanced and integrated geothermal ecosystems, centred around the Mōkai geothermal power station (113 MW) which is operated by Tūaropaki Power Company in partnership with Mercury New Zealand. The geothermal ecosystem also includes Miraka, the world's first geothermally powered dairy processing company, the geothermally heated Gourmet Mokai glasshouses and, in partnership with Japan's Obayashi Corporation, Halcyon Power, New Zealand's first commercial-scale green hydrogen plant.

10 Opened in late 2024, Contact Energy's Tauhara geothermal power station (174 MW) is capable of powering around 200,000 homes.

The He Ahi eco-business park development supplies geothermal heat from some of Contact Energy's wells that tap into the Tauhara geothermal field. This allows small and medium sized businesses to access geothermal heat without needing to drill their own wells.



* Source: //doi.org/10.21420/7fz7-j137

Geothermal wonders at Waimangu Volcanic Valley, including Cathedral Rock (pictured) and the Frying Pan Lake, were formed by a volcanic eruption in 1917 (image supplied by Waimangu Volcanic Valley)

What's holding us back?

Despite its vast potential, New Zealand's geothermal sector faces several barriers. Exploration has stagnated since the Crown's initial drilling efforts, with high upfront costs and fragmented access to geothermal data.

High costs and early-stage risk

Costly drilling is required to confirm and characterise the potential of a geothermal resource in the early stages of a project. While geothermal developments pay off in the long run, the subsurface uncertainty and risk of discovering a 'dry well' can discourage investors from partnering in the early phases, decreasing the chances of development happening. Despite being well-positioned geographically, Māori landowners often face additional hurdles in accessing affordable capital and technical expertise.

Limited access to geothermal data

Much of our knowledge about New Zealand's geothermal systems is not consolidated, making it difficult for new market entrants, smaller players and tāngata whenua to assess project viability and invest with confidence. We also lack the level of data and insights necessary to progress development of geothermal systems that may be well-suited to energy production – both electricity production and direct use.

Slow uptake of geoheat applications

The sector faces challenges in scaling low- and medium-heat applications, which are underutilised despite their potential to decarbonise industries, transition gas users (including in public facilities like hospitals, prisons and schools) and support regional growth. Awareness of lower enthalpy geothermal technologies, such as heating and horticultural applications, is also low, potentially contributing to the limited uptake to date, particularly in regions outside of New Zealand's prominent high-heat geothermal zones.

Regulatory frameworks and wider system settings

Regulatory settings, designed for conventional geothermal use and protection of geothermal surface features, have not kept pace with low-temperature applications and remain undeveloped for emerging next-generation technologies, including supercritical/superhot geothermal.

There is value in ensuring that protected geothermal systems and their globally significant surface features remain protected. Recognising their unique value and contribution to wellbeing, tourism and regional economies is central to this strategy. However, ambiguity in some system classification categories, in particular 'research' systems, has precluded potential development of certain geothermal fields.

What is our opportunity?

New Zealand is the fifth largest geothermal power producer globally[15] and our expertise has shaped projects around the globe. But our unique geology offers a world-class resource with significant untapped potential.

Why now?

Today, advances in technology offer the potential to unlock new efficiencies in existing operations and make previously overlooked fields viable. The opportunity is clear: shift from legacy to momentum – doubling geothermal energy use and expanding applications across the full heat spectrum.

The world is moving towards cleaner, more resilient energy systems. New Zealand's electricity demand is projected to grow by 68 per cent over the next 25 years,[16] and our industrial sectors need to reduce emissions. Geothermal can help meet this challenge, providing low-emissions heat and electricity to food and timber processors, greenhouses, and even powering data centres. Because geothermal is a renewable natural resource, rooted in our land, it offers long-term energy security.

A platform for inclusive growth

Geothermal development is a powerful lever for regional and Māori economic development. Many geothermal fields are located within or near whenua Māori, offering opportunities for iwi, hapū and Māori landowners to lead and benefit from the resource.

There are significant examples of Māori-led geothermal enterprises that have transformed the resource under their feet into a powerful tool for long-term economic, social and cultural benefits. Smaller players and Māori-led development will be critical to achieving the ambitious goals of this strategy.

Protecting, retaining and growing tourism, spa and wellness and unique biodiversity initiatives can highlight the power, natural wonder and therapeutic potential of geothermal resources and further enrich local economies. Deployment of geothermal district heating schemes, commonly utilised in Europe, also present an opportunity for sustainable, affordable heating for New Zealand communities.

The potential of lower temperature geothermal resources

New Zealand's geothermal development to date has mainly focused on electricity generation from the high-temperature geothermal systems of the TVZ and Ngāwhā. However, we also have significant lower heat geothermal opportunities, such as the Tauranga geothermal system,[17] which present underutilised opportunities to establish heating networks, decarbonise commercial operations and increase energy security.

15 **www.thinkgeoenergy.com/global-top-10-geothermal-power-countries-at-year-end-2025**

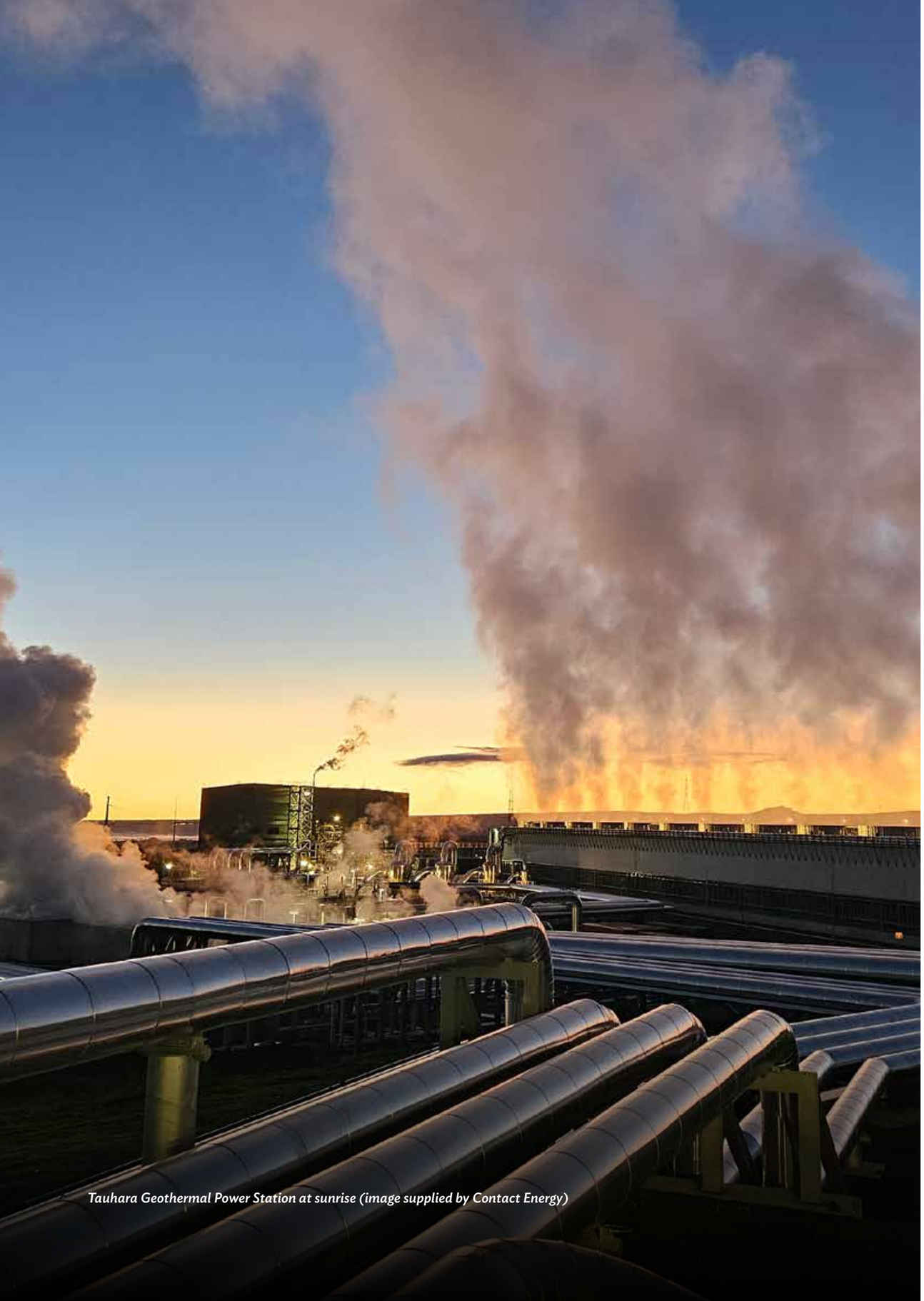
16 Government Policy Statement for Electricity (October 2024): **www.beehive.govt.nz/sites/default/files/2024-10/Government%20Policy%20Statement%20on%20Electricity%20-%20October%202024.pdf**

17 More information can be found in the 'Preliminary Scoping Study: Geoheat Potential of the Tauranga Geothermal System' document (GeoExchange NZ Limited, 2024) which can be accessed here: **atlas.boprc.govt.nz/api/v1/edms/document/A4731812/content**

Looking ahead

Supercritical/superhot geothermal has the potential to provide up to three times the energy output of conventional geothermal resources. Enhanced geothermal systems (EGS) are an approach to stimulating geothermal production that is increasingly used overseas, and New Zealand has much to learn from these developments. Advanced geothermal systems (AGS) may also play a role in our energy future – these systems harness the power of hot dry rock deep underground to create an artificially engineered geothermal resource without extracting any geothermal fluid. These next-generation geothermal technologies could unlock greater capacity from already-producing reservoirs and in lower temperature geothermal areas.

Ngā Awa Pūrua Geothermal Power Station (image supplied by Mercury New Zealand; photo credit: Stephen Wells)



Tauhara Geothermal Power Station at sunrise (image supplied by Contact Energy)

Where we're headed – the vision

From the Ground Up sets a long-term direction for the sustainable growth of New Zealand's geothermal sector. This section unpacks the strategy's vision and strategic outcomes.

The vision – leading the world in sustainable geothermal development

This strategy envisions a future where New Zealand continues to lead globally in geothermal science, innovation and sustainability; attracts investment into reliable, renewable baseload energy, process heat and lower enthalpy geothermal developments; and unlocks new opportunities – from protecting and valuing the significant contribution of geothermal tourism to emerging industries such as mineral and gas recovery from geothermal fluids and geothermal microorganisms.

Through targeted action and collaboration, this strategy aims to ensure the continued development of geothermal resources to support a resilient, low-emissions economy and thriving regional communities.

VISION: New Zealand is a global leader in sustainable geothermal development, delivering innovation, resilience and inclusive growth for future generations.

From vision to results – key outcomes

To achieve this vision, four interconnected outcomes guide action and investment. These outcomes reflect the breadth and depth of opportunity offered by New Zealand's geothermal resources and align with wider Government priorities. They provide a framework for unlocking our geothermal potential in a way that is innovative, sustainable and collaborative, with the Treaty of Waitangi as a guiding principle.

While broad in scope, this strategy includes a specific energy goal – to double geothermal energy use by 2040, focusing activity on a tangible target and reinforcing the role of geothermal resources in New Zealand's energy mix.

STRATEGIC OUTCOMES

1. Extend New Zealand's position as a world leader in geothermal **innovation and sustainability**.
2. Support **energy resilience** by maintaining and accelerating development of increased renewable electricity generation and harnessing geothermal heat to support New Zealand's energy transition.

   GOAL: Double geothermal energy use by 2040
3. Strengthen **regional economies and te Ōhanga Māori** by advancing sustainable geothermal development in partnership with tāngata whenua, and unlock industrial growth, tourism and trade to support New Zealand's goal of doubling exports.
4. Recognise and support the aspirations of iwi and hapū for the sustainable management, development and protection of geothermal resources, using the **Treaty of Waitangi as a guiding principle** and in a way that upholds the Treaty and Treaty settlements and commitments.

How we'll get there – from vision to action

To deliver on the strategy's vision and outcomes an action plan has been developed with five central goals. But the actions in this strategy are more than a checklist – they represent the practical steps that will turn vision into reality. This section unpacks the action plan and shows how it will deliver our vision.

GOAL 1: Improve access to geothermal data and funding to enable development

Expanding access to data and modern mapping technologies will deepen our understanding of the full spectrum of New Zealand's geothermal resources and unlock new development opportunities, particularly for Māori landowners and smaller players. **Establishing a baseline of publicly available data** is the first step towards a **centralised repository of geothermal resource data** to support informed decision-making, attract investment and accelerate responsible development across New Zealand.

Reducing early-stage risk is key to unlocking investment and accelerating development. The Government will **explore options for early-stage risk-sharing mechanisms** to give developers confidence to move projects forward and secure additional sources of funding.

GOAL 2: Ensure regulatory and system settings are fit-for-purpose

Modern, adaptive regulatory and system settings are essential to enable innovation and support next-generation technologies (e.g. EGS, AGS and supercritical/superhot), while protecting New Zealand's unique geothermal resources and providing certainty for investors. The current resource management reforms present an opportunity to advance the ambition of this strategy. This includes applying evidence-based approaches to certain system classifications (e.g. research systems), so development opportunities can be realised responsibly.

Strengthening wider system settings will help attract new talent and maintain a durable pipeline of skills. **Building clear career pathways** and **fostering international partnerships** will help to secure a skilled workforce and keep New Zealand at the forefront of geothermal innovation. **Reviewing outdated geothermal regulations** will enable them to be updated to fit both current and next-generation technologies and approaches.

GOAL 3: Advance knowledge and uptake of existing geothermal technologies and geoheat opportunities

Expanding the use of lower enthalpy geothermal technologies, such as heating and horticultural applications, offers significant economic and environmental benefits. Accelerating uptake will help businesses reduce energy costs, cut emissions and unlock new opportunities for growth.

The Government will support this transition through **targeted education and feasibility assessments and exploring demonstration projects** to ensure businesses have the tools and confidence to adopt geoheat solutions. Working with industry partners and public-private collaborations, we will **showcase the value of geoheat** to encourage wider adoption across New Zealand.

GOAL 4: Enable place-based geothermal clusters

Aligning the supply of proven geothermal resources with local demand creates opportunities for regional growth and energy resilience. **Regional geothermal clusters** can foster this synergy, driving innovation, investment and shared benefits for communities.

The Government will enable coordination and collaboration among landowners, tāngata whenua, local authorities, industry, investors and developers. We will explore practical tools such as **place-based planning** and **tailored incentives** to encourage collaborative development and maximise regional value. Innovative cluster models, including cascade use[18] developments, can further enhance geothermal efficiency and spread development costs across multiple parties.

GOAL 5: Drive geothermal science, research and innovation, including next-generation technologies

Advancing geothermal science and innovation will keep New Zealand at the forefront of global developments. The Government's **reform of the science, innovation and technology system** creates an opportunity to explore how it can support geothermal research and understanding of next-generation technologies, ensuring we remain well-positioned for future opportunities.

The Government has made a significant commitment to **New Zealand's first supercritical/superhot geothermal exploration project,** with design work underway and drilling targeted for 2027 at land within the Rotokawa geothermal field. This project will lay the foundation for future breakthroughs in supercritical/superhot technologies. Beyond this, there are opportunities to learn from international approaches to EGS and AGS and adapt them for New Zealand where appropriate.

18 Cascade use refers to using a geothermal resource for multiple sequential applications to maximise its efficiency (e.g. using the same geothermal fluid for electricity generation, then for district heating, and finally for greenhouses or aquaculture).

Action plan

ACTION PLAN GOALS	Improve access to geothermal data and funding to enable development	Ensure regulatory and system settings are fit-for-purpose	Advance knowledge and uptake of existing geothermal technologies and geoheat opportunities	Enable place-based geothermal clusters	Drive geothermal science, research and innovation, including next-generation technologies
HORIZON 0 (2025)		• **Leverage international geothermal partnerships** to support New Zealand's sector capability and bilateral relationships ✓ *(ongoing)* • Develop new **planning and environment legislation** that enables the sustainable use of geothermal resources ✓	• Support development of the New Zealand Geothermal Association's **geoheat information package for businesses** looking to use direct geothermal heat for industrial/process heat *(launched July 2025)* ✓ • **Include the geothermal sector in the *Request for Information*** seeking long-term partnership proposals that leverage the government's energy use or through other mechanisms to underwrite energy projects ✓	• Work with geothermal customers, developers, investors, iwi, hapū and Māori landowners to **grow geothermal opportunities** in New Zealand ✓ *(ongoing)*	• **Determine first test well site for supercritical/superhot geothermal** ✓
HORIZON 1 (2026-2027)	• Establish a baseline of **publicly available data** (including identifying key gaps) • Develop a **sector snapshot for the geothermal sector,** including the value of geothermal tourism • Explore options for a **centralised geothermal data repository** • Explore options for further **low heat geothermal mapping** • Use funding ringfenced from the Regional Infrastructure Fund to **enable geothermal development** • Explore options to **de-risk or incentivise early-stage geothermal exploration or drilling**, including support for Māori landowners and smaller players	• Clarify the application of the Crown Minerals Act 1991 to **minerals in geothermal fluid** • Provide greater certainty to industry through the **development of a carbon capture, utilisation and storage (CCUS) framework** • Explore whether **ETS industrial allocation settings** are acting to limit uptake of geothermal heat • Explore the **role of policy direction** for managing geothermal resource (including the role of national direction in the new Resource Management system) • Work with the education and training sector to strengthen geothermal career pathways to support an **ongoing talent pipeline** • Consider the Waitangi Tribunal's reporting regarding **Wai 2358** (when released)	• **Promote the role of geoheat** in the energy transition from 2026	• Explore how **zoning provisions and new spatial planning provisions** can facilitate increased investment and coordination across geothermal economic activity • Identify **geothermal tourism opportunities** in Taupō and Tarawera regions, in partnership with iwi to support Māori economic development • Use funding ringfenced from the Regional Infrastructure Fund to **enable geothermal place-based clusters** • Explore options to develop a **Geothermal Centre of Excellence** (industry, iwi and hapū, landowners, academia and government) to encourage collaboration, information sharing and accelerate R&D	• Explore the **role of the reformed science, innovation and technology system** in supporting geothermal science and understanding of next-generation technologies such as supercritical/superhot geothermal and enhanced and advanced geothermal systems (EGS/AGS) • **Undertake drilling programme for supercritical geothermal** on first test well site
HORIZON 2 (2028-2029)	• Investigate appropriate mechanism(s) for **ongoing provision of geothermal data** to a central repository • Consider the need for Crown involvement in **further exploration or modelling**	• Ensure **geothermal regulatory frameworks** are fit-for-purpose and for next-generation geothermal technologies • Investigate the appropriateness of **system classifications (e.g. research system)** for particular geothermal systems (following data collation undertaken in Horizon 1)	• Explore **mechanisms to pilot technology** for commercial and residential developments • Explore **transitioning government users** to geothermal technologies	• Explore opportunities and potential incentives for manufacturers and other sectors (e.g. horticulture, spa and wellness) to **cluster** or relocate	• Explore options and **attract funding/ investment for second supercritical/ superhot geothermal exploration well**
HORIZON 3 (2030 onward)	• **Ongoing curation** of geothermal data and insights • Explore potential for **Crown-led exploration**				• **Develop geothermal technologies** to support and install supercritical/ superhot geothermal power stations and connect to successful well sites

Note: Content and timeframes are indicative and may change as policy, timing and funding decisions develop. Government resourcing and funding decisions will be sought through usual processes.

Conclusion – realising New Zealand's geothermal opportunity

Successfully capitalising on this unique opportunity will require coordinated action across government, industry, tāngata whenua and research communities.

Ongoing collaboration, innovation and commitment from all partners will be essential to achieving the strategy's vision and outcomes. Together, we will deliver a low-emissions future, strengthen energy security and drive regional prosperity, guided by kaitiakitanga[19] and ensuring benefits endure for future generations.

This strategy provides a clear framework for action, setting out priorities and pathways to unlock New Zealand's geothermal potential. Its success will depend on genuine partnership, shared expertise and a commitment to innovation.

By maintaining momentum and working together, we can secure a sustainable, resilient and prosperous future powered by New Zealand's geothermal advantage.

Geothermal taonga of Whakarewarewa Living Māori Village in Rotorua (image supplied by Earth Sciences New Zealand)

19 Kaitiakitanga is defined in the *Resource Management Act 1991* as "the exercise of guardianship by the tāngata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship".

TOPP2 Geothermal Power Station in Kawerau (image supplied by Eastland Generation)

Te Kāwanatanga o Aotearoa
New Zealand Government

AOG 12297