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How much heat do we need?

New Zealand's process heat

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EECA
TE TARI TIAKI PŪNGAO
ENERGY EFFICIENCY & CONSERVATION AUTHORITY

EECA's strategy

Our mission

Mobilise New Zealanders to be world leaders in **clean and clever** energy use.

Our desired outcome

Energy users save energy, money and reduce emissions.
Energy productivity and resilience improves.

Energy efficiency first

Efficient energy use is the first option users adopt.

Empower energy users

Users are empowered to control their energy.

Accelerate renewable energy

Users transition to low emissions energy.

EECA's Levers

Regulation

Of products, processes, and systems.

Information and motivation

To promote clean and clever energy choices.

Targeted investment and support

To demonstrate and scale up energy efficient technologies and renewable energy use.

EECA

RETA Process Heat Insights

RETA develops what is required for industrial process heat

1

Regional stakeholder kick off meeting

- Process heat users
- Transpower & EDBs
- Forest owners & wood processors
- EDAs and councils
- Iwi

2

Demand assessment workstream

- Site thermal requirements and decarbonisation projects

Electricity availability workstream

- Spare electrical capacity; work and cost to electrify sites

Biomass availability workstream

- Regional availability and cost of potential biomass sources

3

Regional stakeholder workshop

- Present back findings from the workstreams and gather feedback

4

Final integrated report

- Combine workstream analysis and construct regional pathways
- Write, design, and publish report

Process heat uses a lot of fossil fuel

800

Sites included in RETA programme

4,800 MW

Fossil fuelled installed capacity

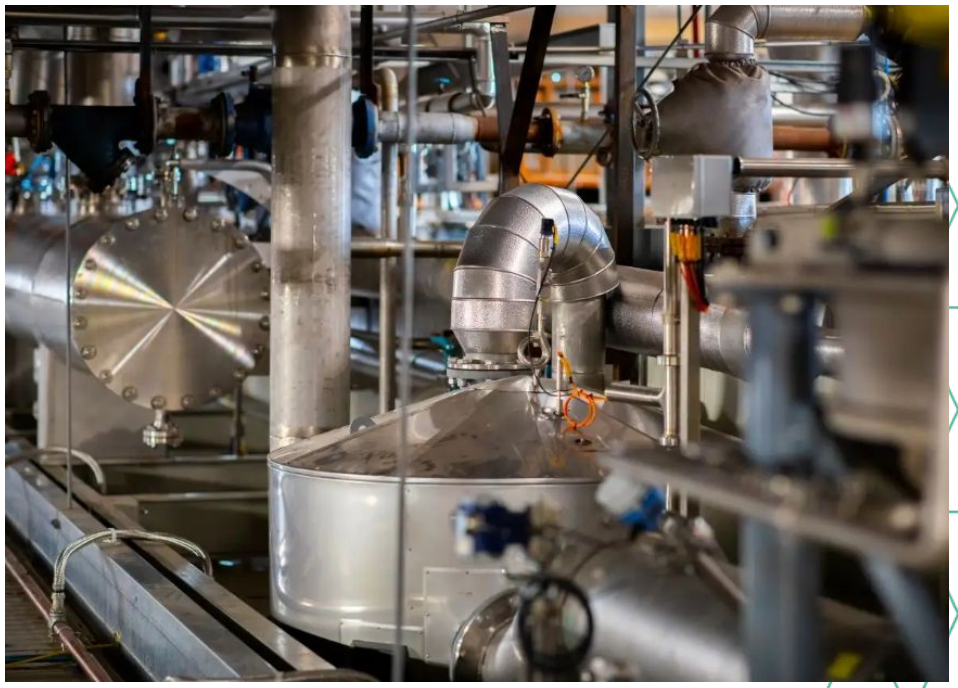
20 PJ

Baseline annual coal use

40 PJ

Baseline annual piped fossil gas use

Energy efficiency first!



The RETA process looks at three key project types:

- Energy efficiency
- Heat pumps for under 100 degree applications
- Above 100 degree applications

	Projects assessed	Fossil Fuel Reduction (PJ)	Fossil Fuel Reduction
Energy efficiency	**600**	**8**	**14%**

Heat pumps are economic for lower temperature heat

RETA heat pump projects:

- 1,000 MW thermal output
- 300 MW electrical input (average 500 kWe per heat pump).
- 2 PJ electricity use

	Projects assessed	Fossil Fuel Reduction (PJ)	Fossil Fuel Reduction
Heat pumps	**500**	**8**	**13%**

3 GW of high temperature heat required

	Projects assessed	Heat Required (PJ)	Peak Heat Required (MW)
High Temperature Requirement	**520**	**36**	**3,200 MW**

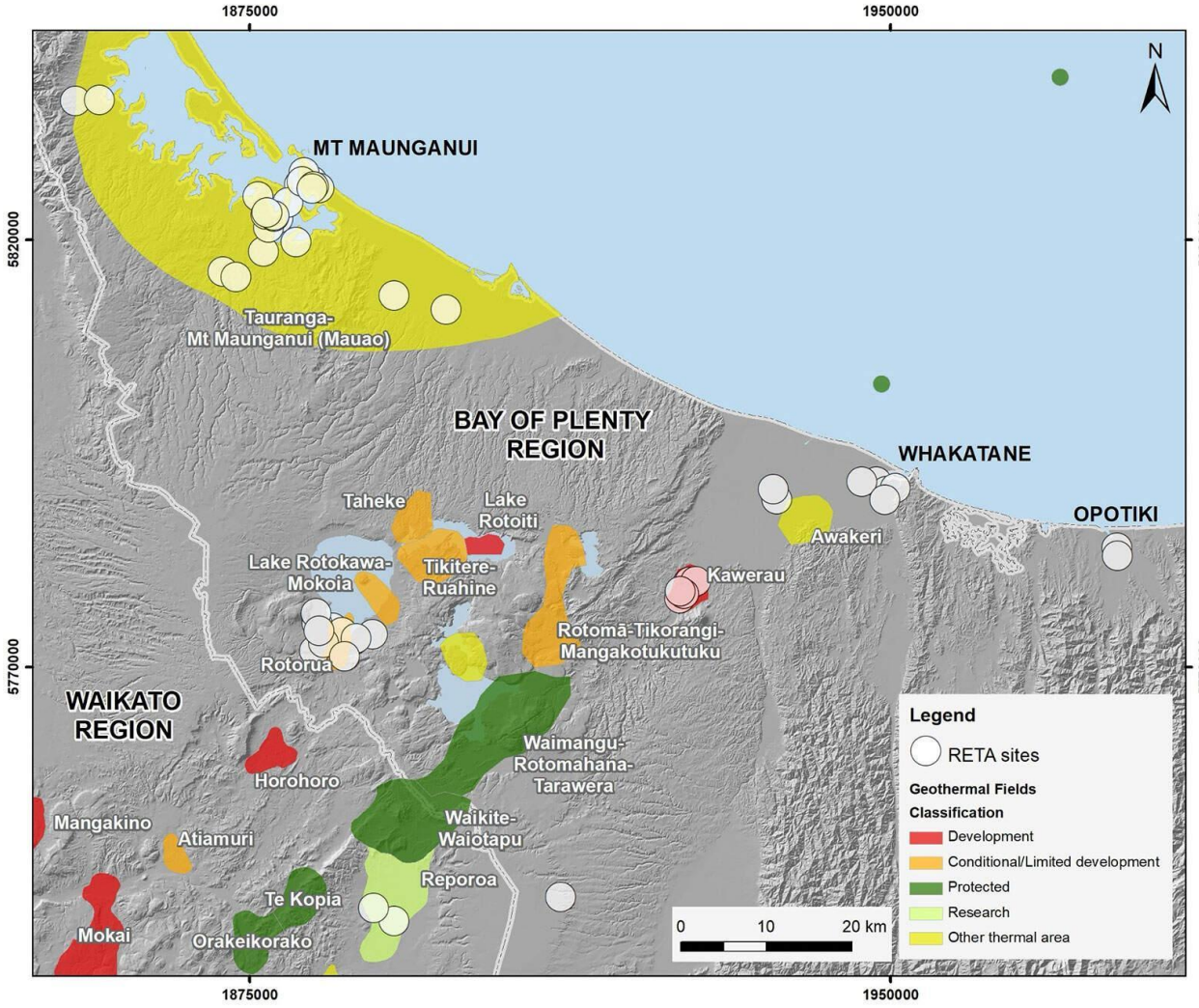



Bay of Plenty demonstrated geothermal potential

RETA programme included some geothermal options where costs were detailed, and they were more economic than their conventional alternatives.

Example commercials for a direct steam development:

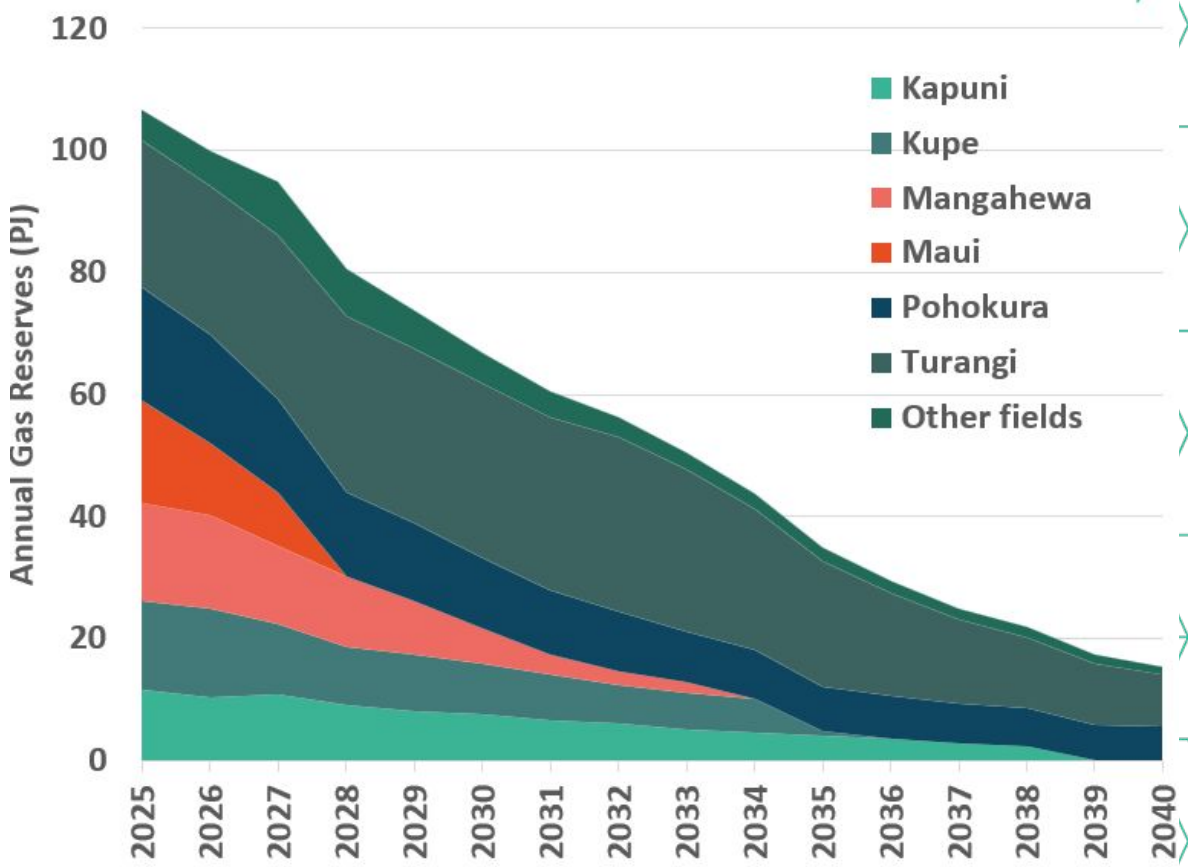
- $45M CAPEX, $1M p.a. O&M
- 320 TJ p.a. steam delivered
- 13% IRR at $20/GJ



Market considerations

Fossil gas scarcity driving industrial change

- “Previous forecasts had annual gas production falling below 100 PJ by 2029, but due to revised production forecasts we now expect to reach this level by 2026.” [MBIE]
- Need to transition at a rate of one large gas user a week.

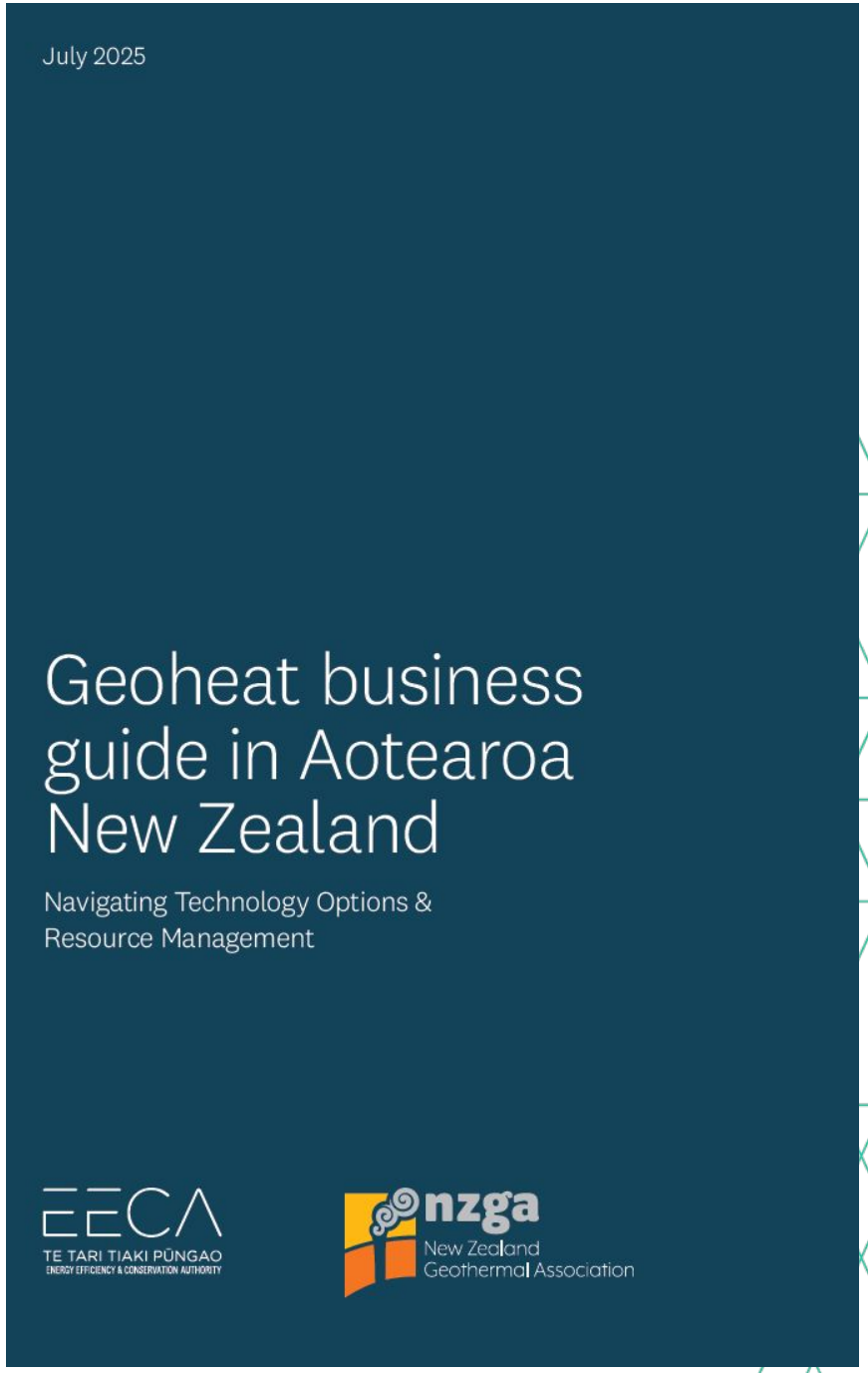


Geoheat Business Guide

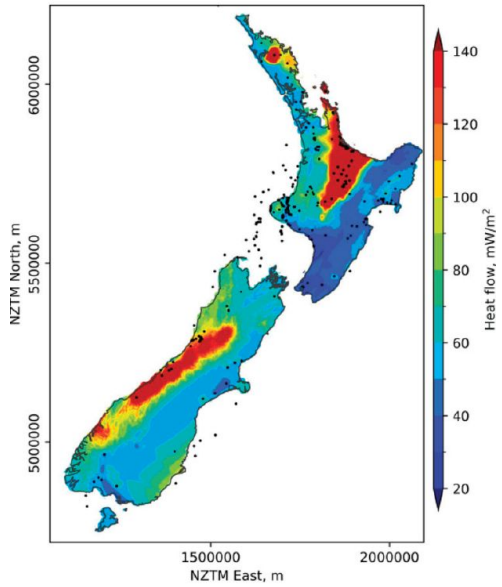
We've helped NZGA develop the geoheat business guide

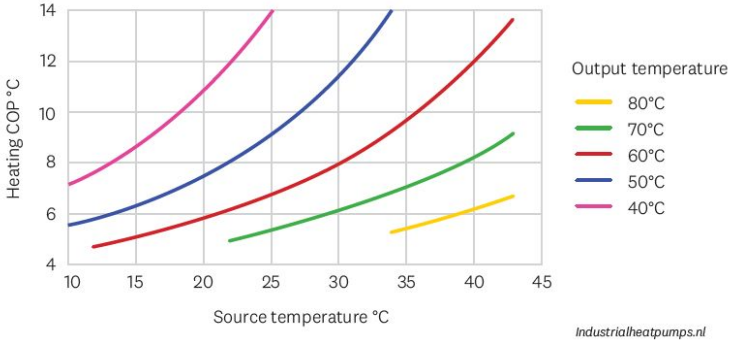
Engagement with industry stakeholders unearthed a general information gap in geoheat applications – especially for lower temperature resources and applications.

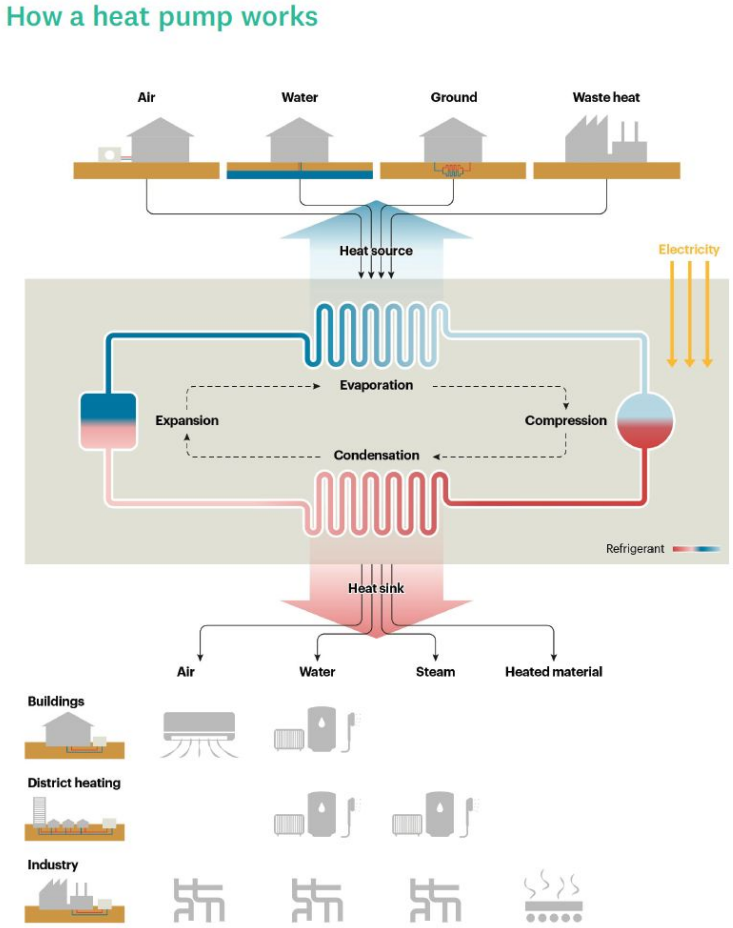
This business guide aims to address this gap.

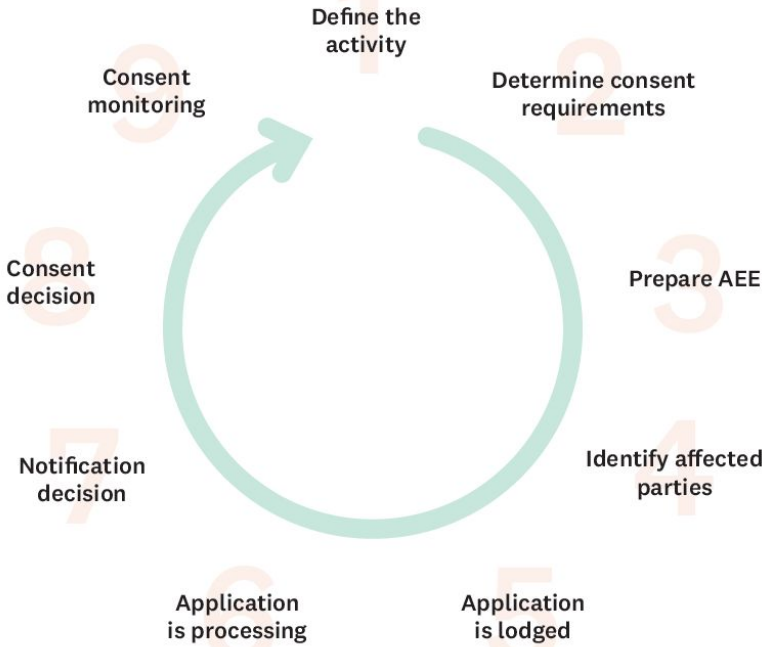


The guide presents technology options and consenting requirements









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Ngā mihi

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