

14th February 2024

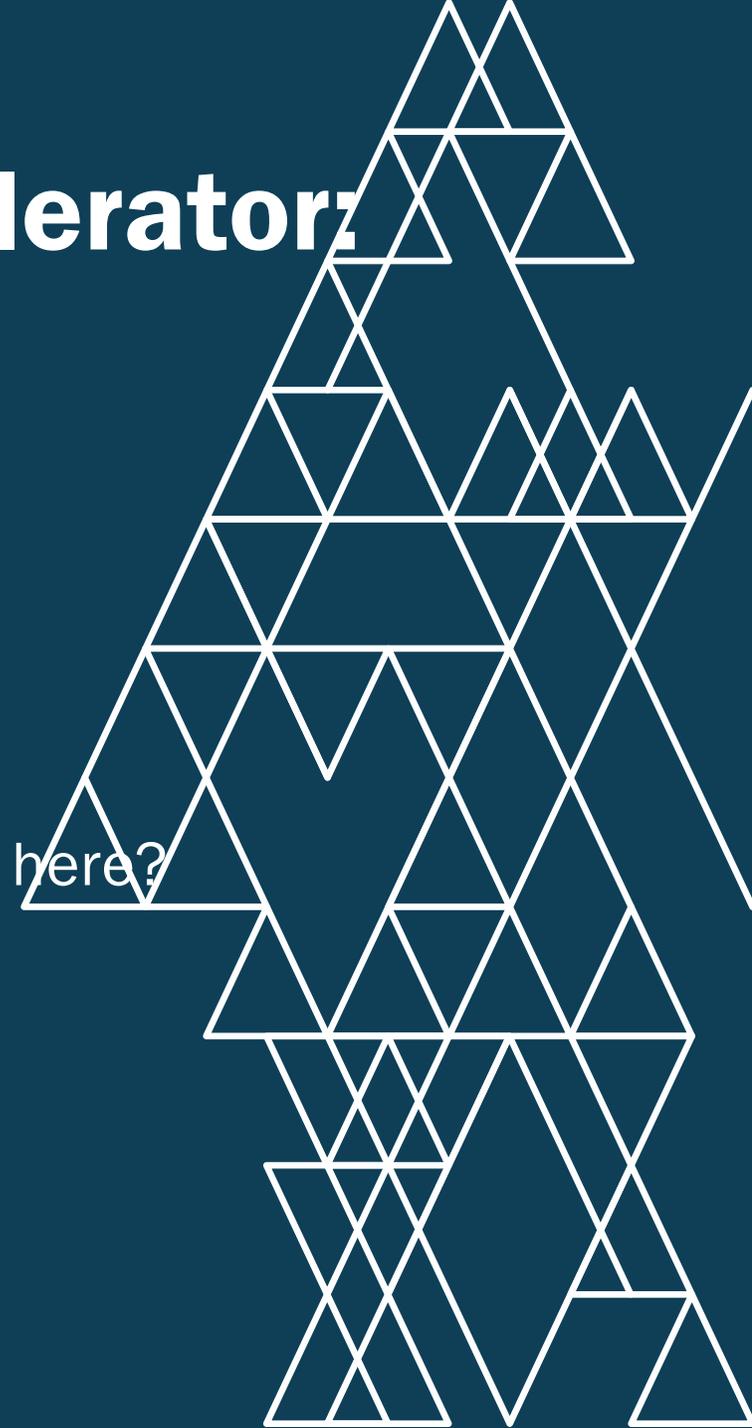
Regional Energy Transition Accelerator (RETA) – Waikato



Regional Energy Transition Accelerator

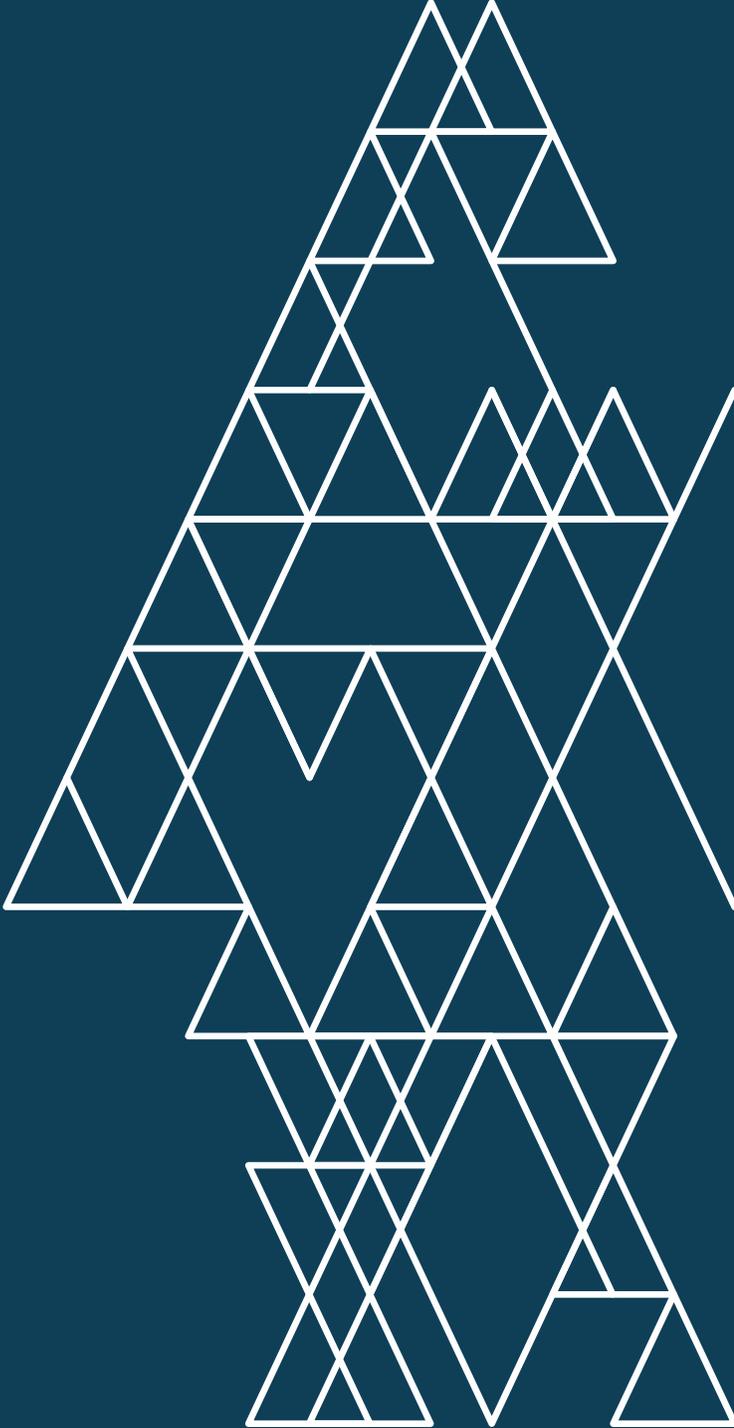
We need to do more, faster and together

- Welcome and introduction – Te Waka
- EECA Introduction
- RETA Programme overview
- Stakeholder discussion – What's your motivation for being here?
- Closing remarks



EECA Introduction

EECA



We are advocates for clean and clever energy use. Enablers. We approach our task with passion and enthusiasm.

We're talking to everyone in New Zealand, across the generations. It will take all of us to make this work.

To be clean and clever, first we must change. This is a journey of growth, to adopt new technologies, to use our power as consumers, and to create the system change necessary to sustain our future.



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

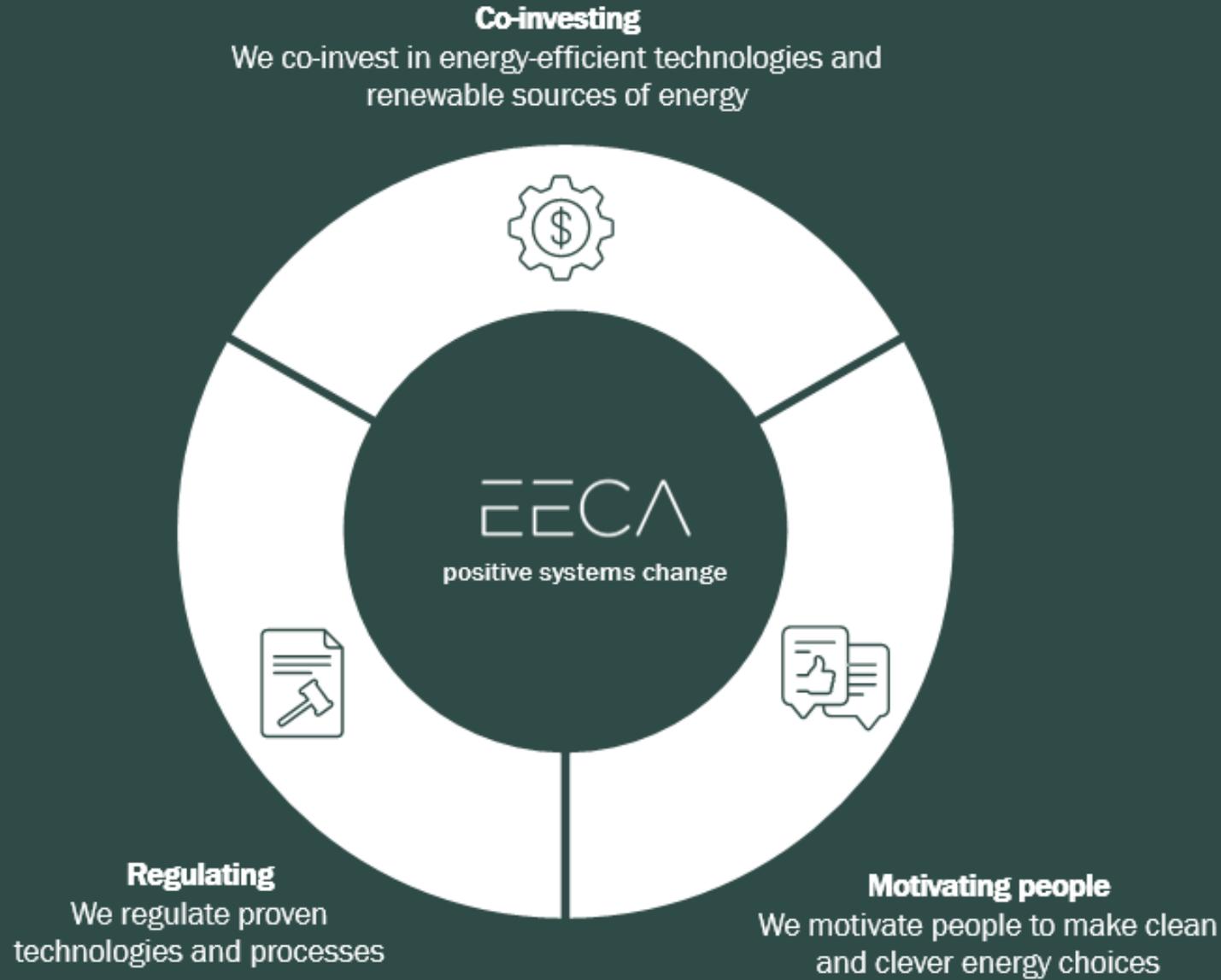
We are a small, but nimble country. We have a role on the global stage to show what can be done – taking a leadership position, so others will follow suit.

Clean energy is renewable, low emissions energy. It balances human wellbeing with the needs of our ecosystem.

Anything that gives you more, while using less energy, is clever. We advocate for smart, adaptable, conscious, reliable ways to make and use energy.

Energy is in everything. If making, moving, using or throwing it away produces energy-related greenhouse gas emissions, then it's in our lane.

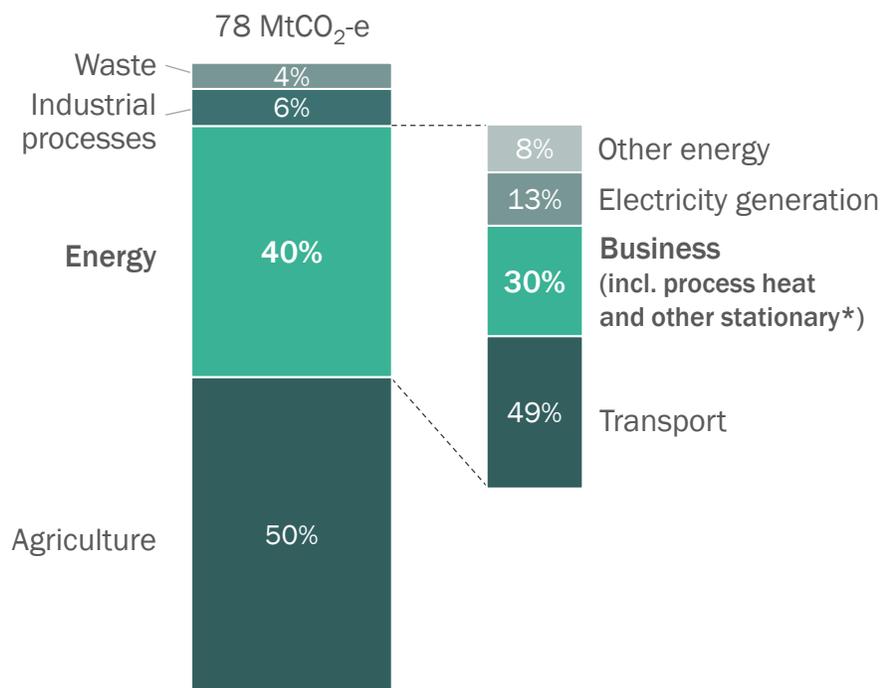
EECA's three levers



Decarbonising stationary heat emissions is a priority

New Zealand's Emissions Breakdown

(2020)

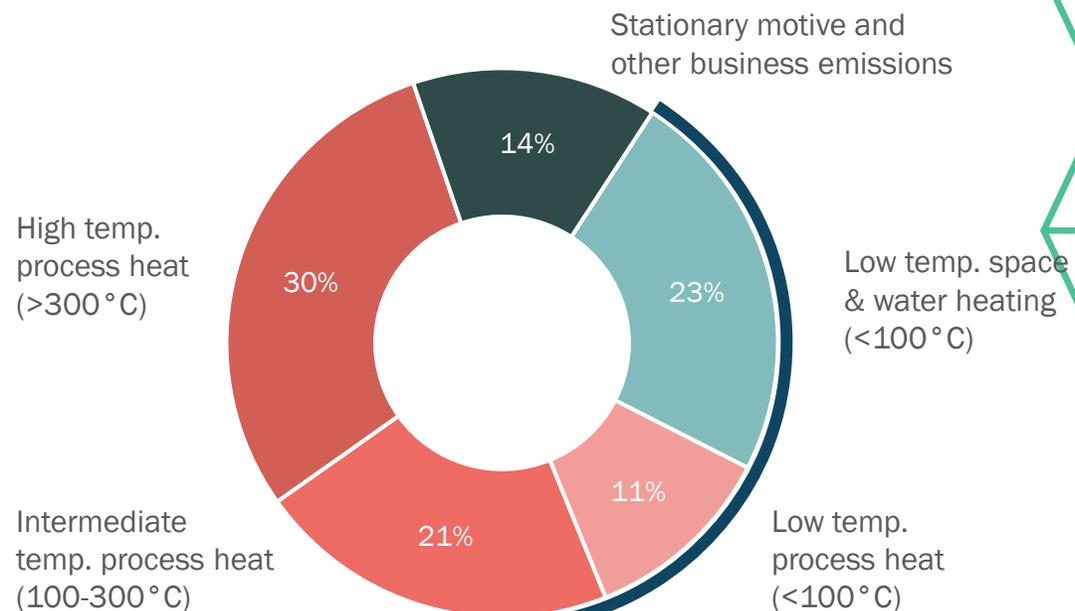


*Excluding business emissions from electricity use, which is included in 'Electricity generation'
Sources: Ministry of Business, Innovation and Employment, Ministry for the Environment and EECA analysis.



Business Emissions Breakdown

(2020 excl. Electricity)



Heat applications where alternative low emissions technologies exist



GIDI Fund: Significant progress, more to do

81

Active projects

\$112.2M

EECA co-investment

\$195.9M

Private funding

456.6K

Tonnes of CO2 avoided per year

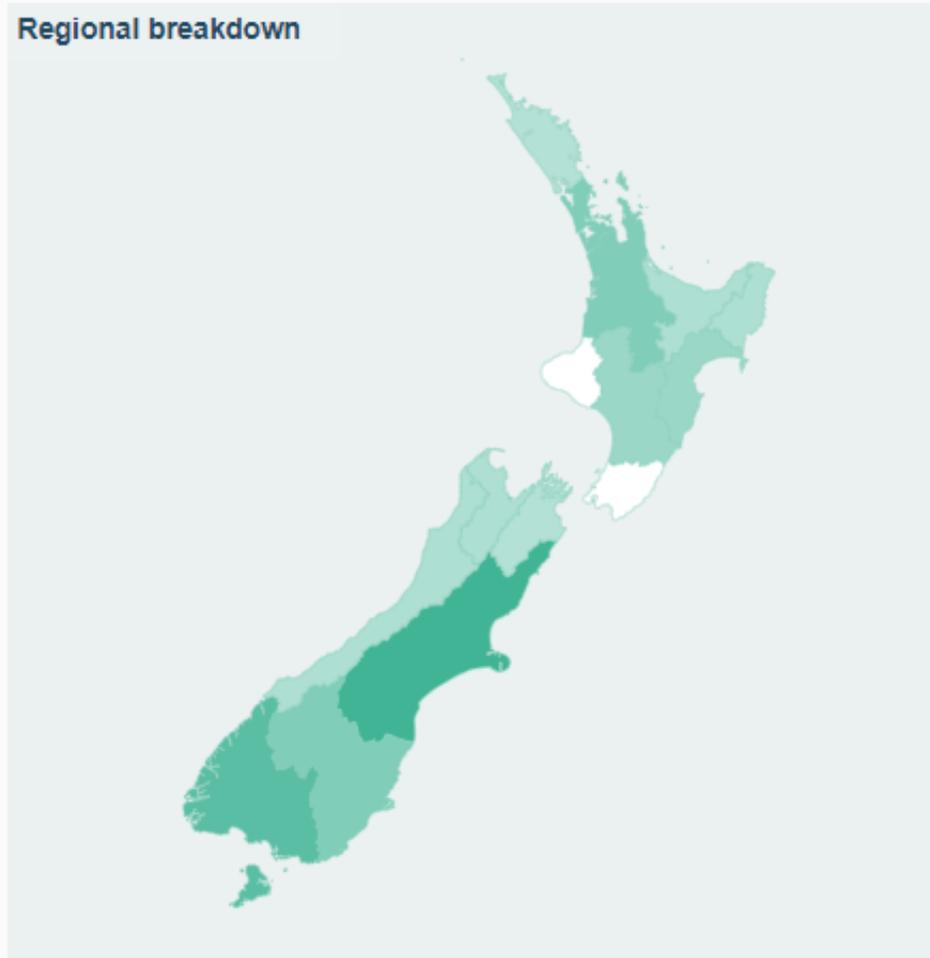
169.1K

Equivalent cars off the road

Project breakdown

GIDI: Industrial	April 2021
Projects	16
EECA co-investment	\$27,792,958
Estimated annual abatement	185,000
GIDI: Industrial	September 2021
Projects	21
EECA co-investment	\$27,839,769
Estimated annual abatement	139,700
GIDI: Industrial	April 2022
Projects	12
EECA co-investment	\$7,020,782
Estimated annual abatement	26,000
GIDI: Industrial	April 2023
Projects	15
EECA co-investment	\$16,233,326
Estimated annual abatement	38,300
GIDI: Industrial	August 2023
Projects	17
EECA co-investment	\$33,310,389
Estimated annual abatement	67,300

Regional breakdown



Region	No. of projects
Canterbury	19
Southland	15
Auckland	9
Otago	9
Waikato	9
Hawke's Bay	5
Manawatu-Wanganui	5
Bay of Plenty	2
Gisborne	2
Nelson	2
West Coast	2
Marlborough	1
Northland	1
Total	81

Note: Click on a date (i.e. April 2021, September 2021) on the tables to the left to filter the data on this page. Click on the date again to reset the filter.

*Projects updated as at September 2023

Business Support

New Zealand needs maintain momentum

- Paris commitments, international markets, and increasingly local consumers are expecting it
- First principles apply: Energy Efficiency first, energy/carbon productivity, strategic asset management – have a plan
- National Direction on industrial greenhouse gas emissions - fossil fuel combustion >500t CO₂ p,a,

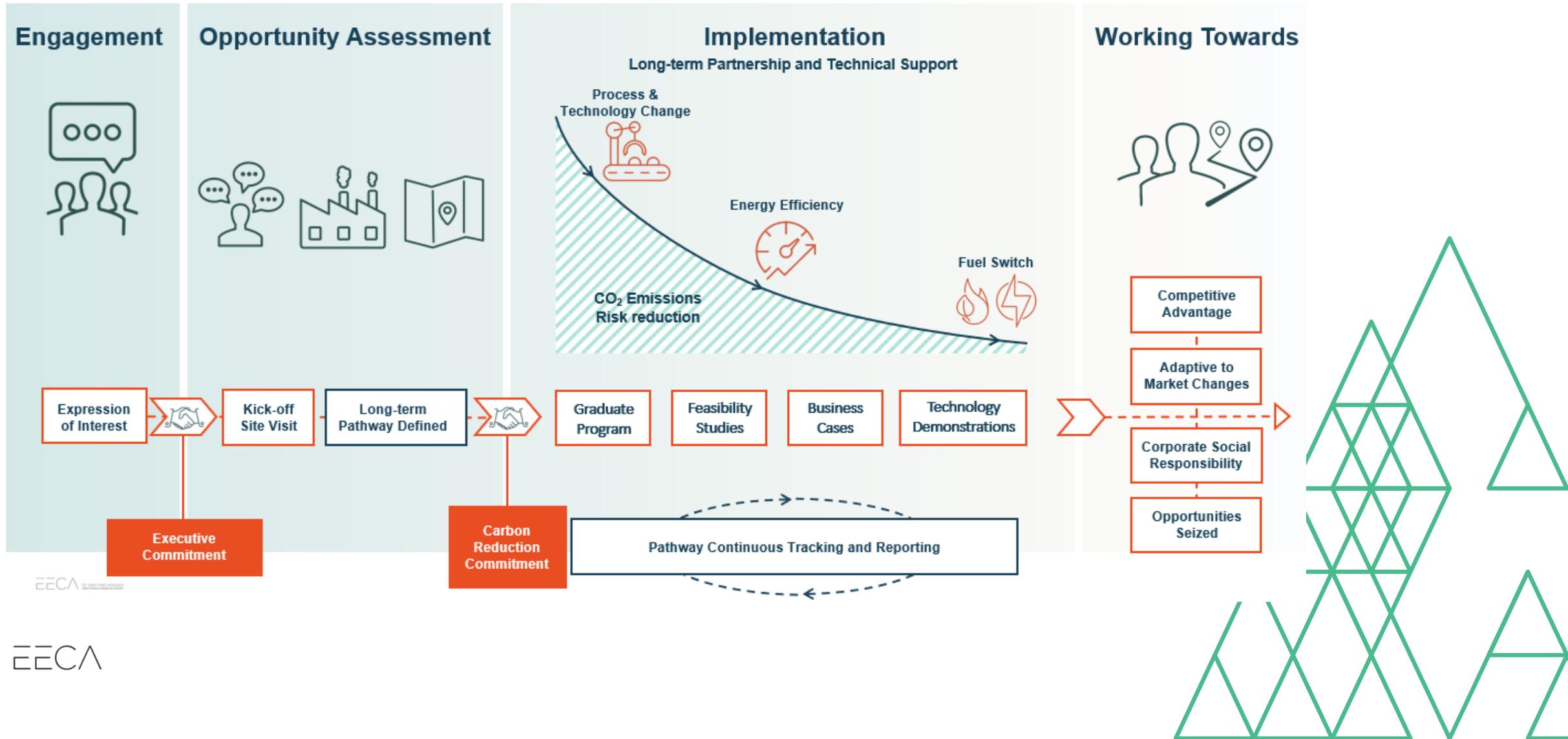
How EECA can help

- Energy Transition Programme – supporting business, regions and sectors decarbonise
- Sector Decarbonisation Programme – sector specific tools and resources for medium to small business
- Account Management support for large businesses
- Technology Demonstration Fund - Technology Innovation is a key priority
- Co-funding support for identification and optimisation
- Low Emissions Transport programmes

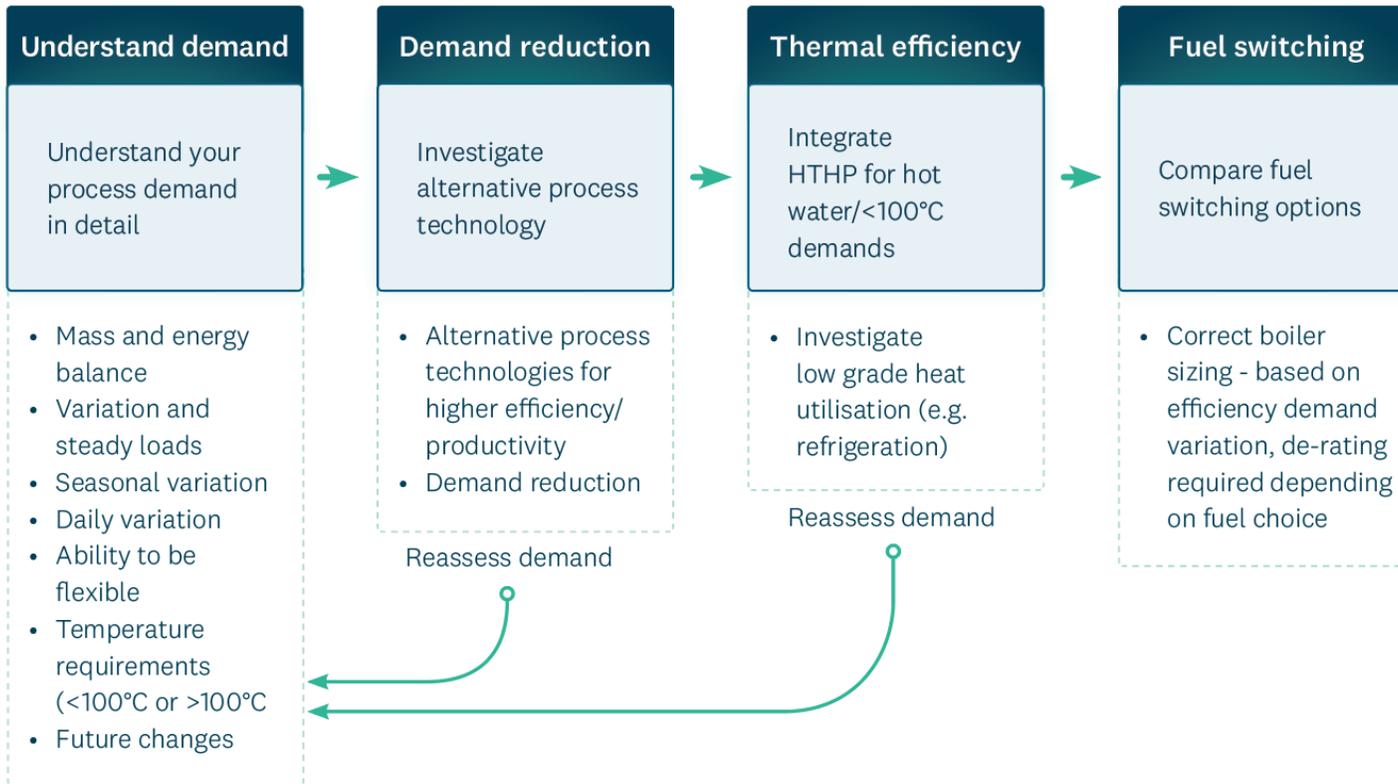
EECA



EECA's Energy Transition Accelerator is a powerful tool



We look at demand reduction and fuel switching



Electricity

- Electrode boiler
- Network capacity increase required?
- Ability to flex demand to minimise cost
- Electricity tariff

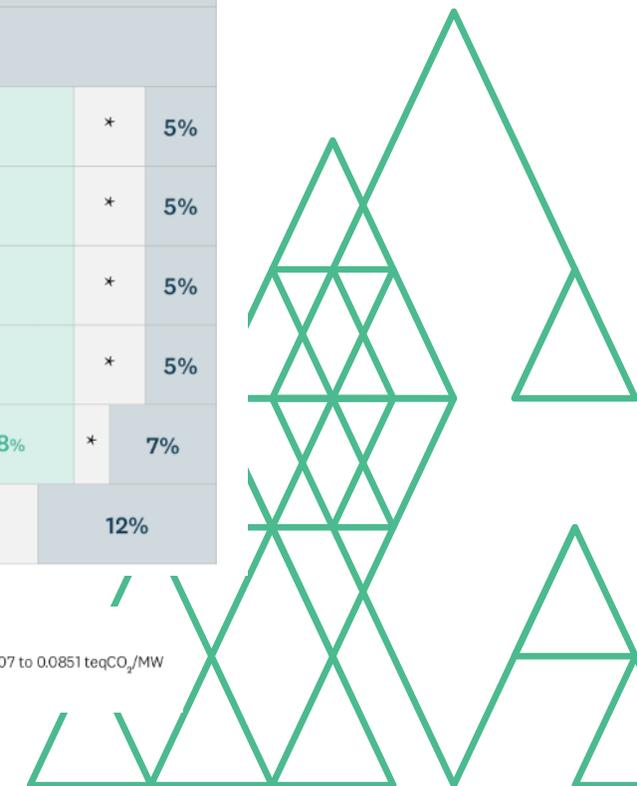
Biomass

- Age of boiler - conversion or new boiler?
- Fuel supply and price - pellets, chip, hog
- Operational requirements for different fuels
- Fuel storage requirements for different fuels



A visual pathway enhances transparency and compliance

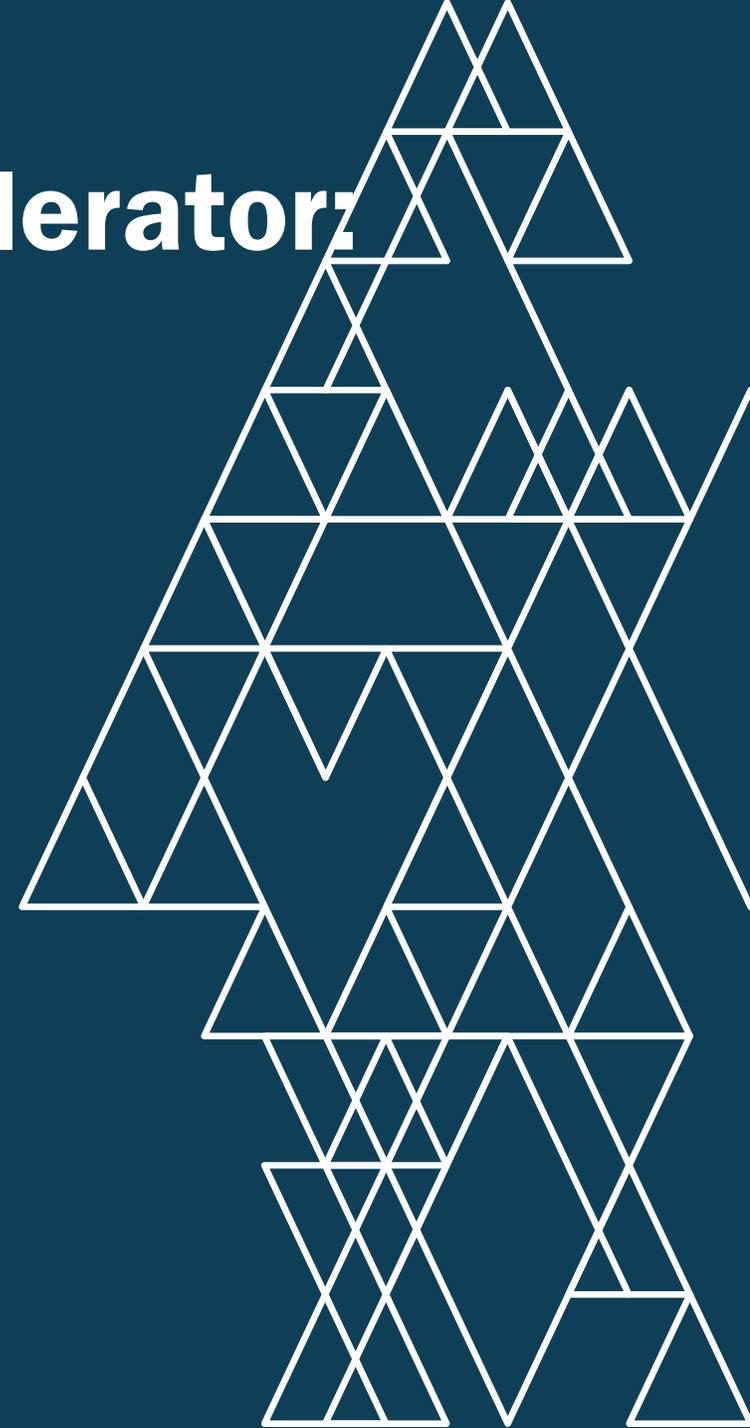
McCain transition pathway							
Actions		Projected emissions reduction					
Energy demand reduction	Pulsed electric field	15%	85%				
	Blancher heat recovery	8%	77%				
	Fryer heat recovery <i>(Mechanical vapour recompression technology)</i>	12%	65%				
	Steam network heat recovery <i>(flash steam, blowdown...)</i>	5%	60%				
Fuel switching	Option A: Boiler conversion to biomass		50%			*	5%
	Option B: Switch to biogas + <i>(biogas/biomass/electricity)</i>		25%	 		*	5%
	B1: Full biogas <i>(waste import from external sources)</i>		50%			*	5%
	B2: Biogas with internal waste only completed by biomass		25%	 25%		*	5%
	B3: Biogas to cover fryer and peeler steam/high temperature demand. Heat pumps to cover the rest		30%	 18%		*	7%
	Option C: Electrification		39%			*	12%



Regional Energy Transition Accelerator

A programme building a regional, systems view

Introduction to RETA programme



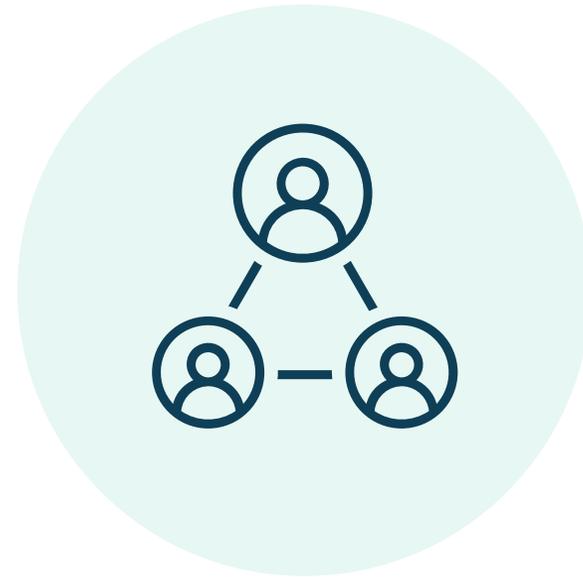
Because, information sharing and collaboration supports decision making and provides confidence

- The need to decarbonise is a **wholesale problem** – that will benefit from a **coordinated system approach**
- **Information and guidance is not readily available**
- Need to **understand energy demand** and ensure **sufficient supply**
- **Information sharing** would increase efficiency and optimise output, instead of businesses individually exploring decarbonisation
- **Coordination or shared visibility** is needed to overcome challenges (e.g. investment in shared infrastructure or new supply)



Workstreams provide a mix of skills and insight

- **Regional process heat demand assessment (Lumen)**
 - Process heat demand and demand characteristics
 - Process heat emission reduction opportunities with timeline
 - Demand load profiles and characteristics
- **Electricity availability assessment (Ergo)**
 - Spare electrical capacity
 - Work required and cost to electrify sites
- **Biomass availability and cost assessment (Ahika and Margules Groome)**
 - Quantify biomass that could potentially be utilised for bioenergy
 - Model costs for recovering and delivery of resource
- **Regional decarbonisation pathway modelling (Lumen, EECA, & Sapere)**
 - Electricity centric, biomass centric, optimal with approximate timings
- **Main report (Sapere)**

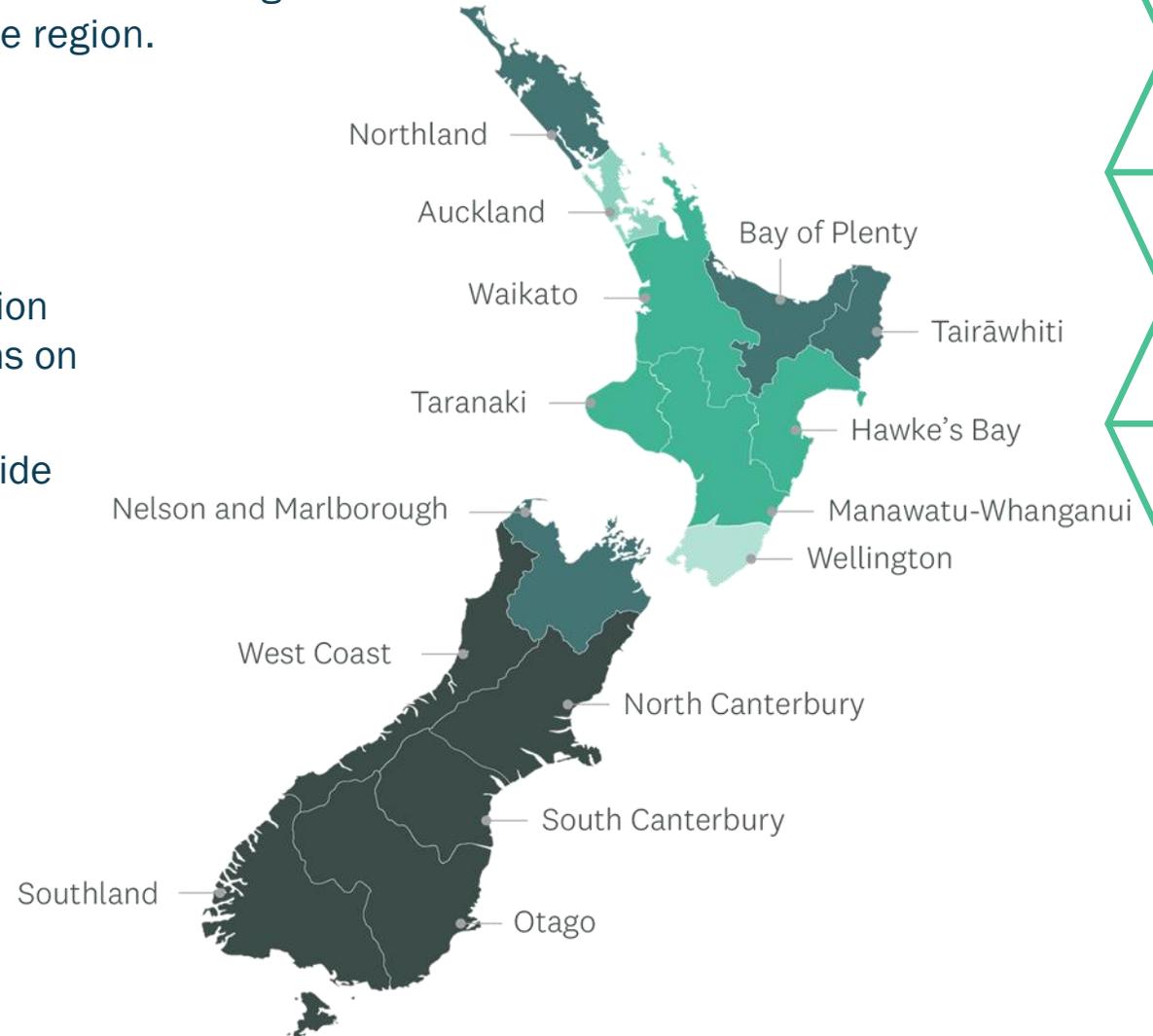


RETAs are underway across the country

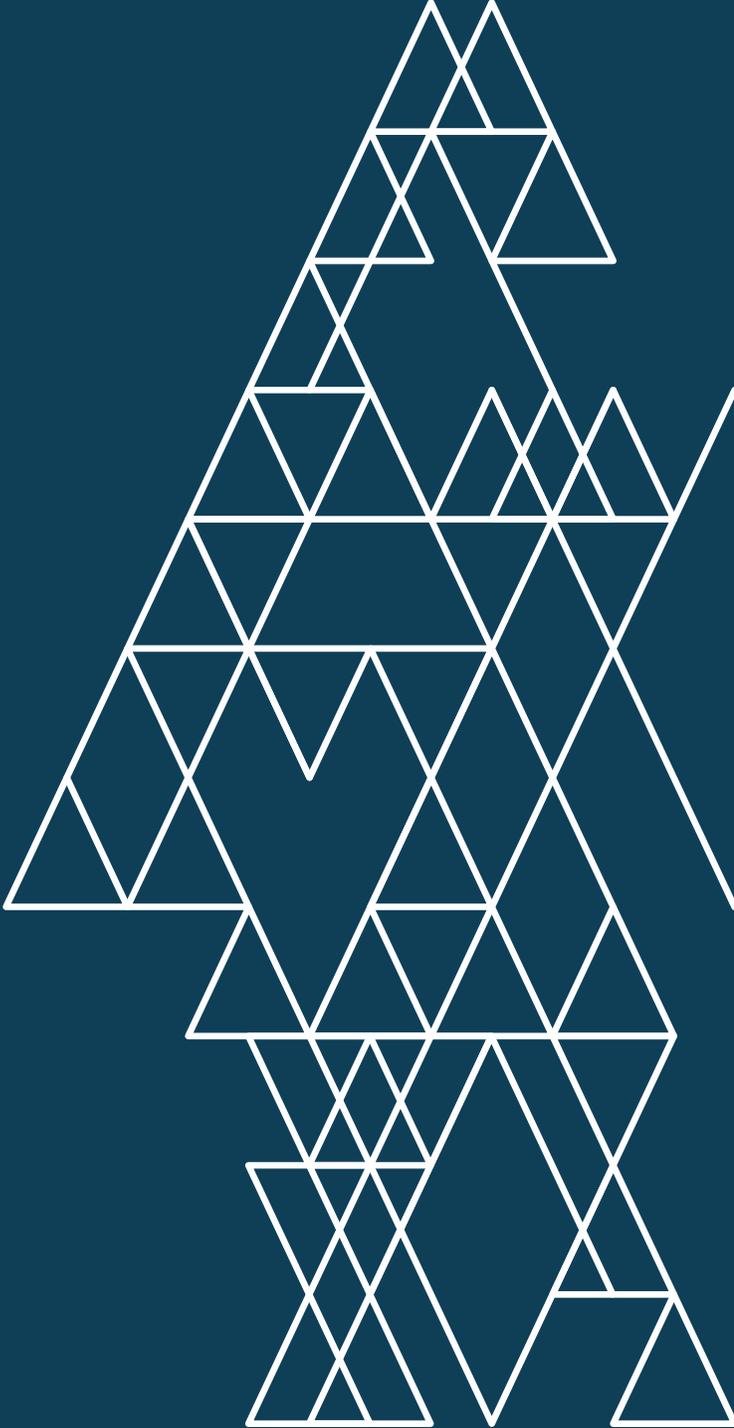
RETA – a programme designed to develop, and share, an understanding of what is needed to decarbonise process heat use in the region.

The planning stage results in a report to:

- Provide process heat users with coordinated information specific to the region to make more informed decisions on fuel choice and timing;
- Improve fuel supplier confidence to invest on supply side infrastructure, and;
- Surface issues, opportunities and recommendations.

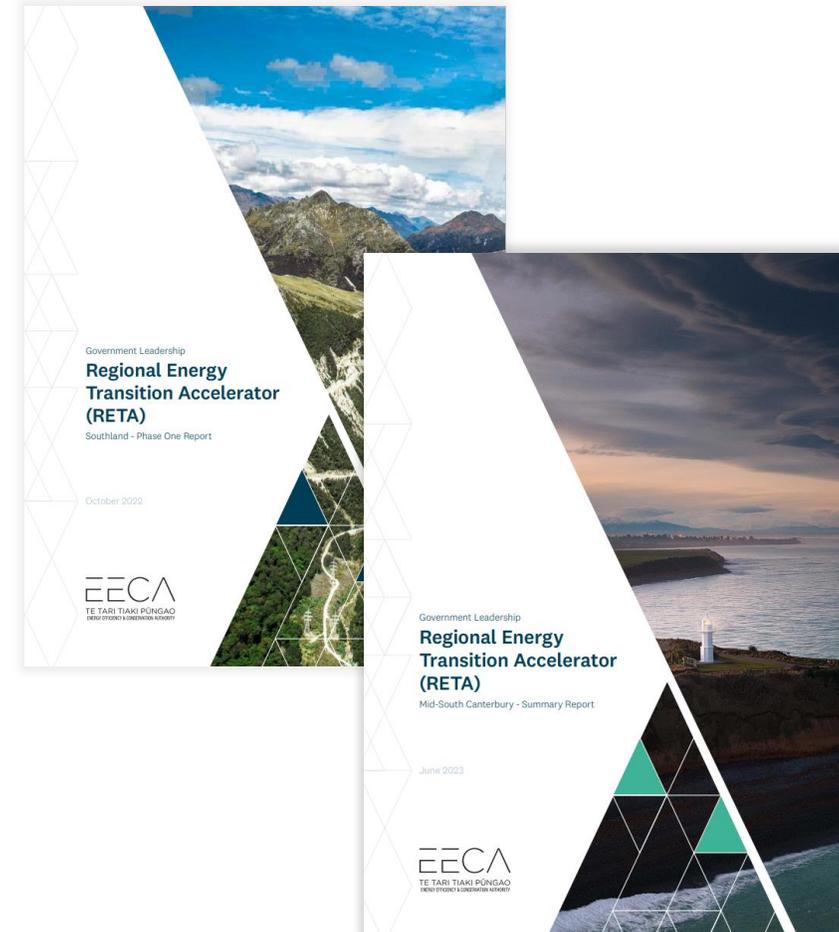


RETA learnings to date



RETA report for each region

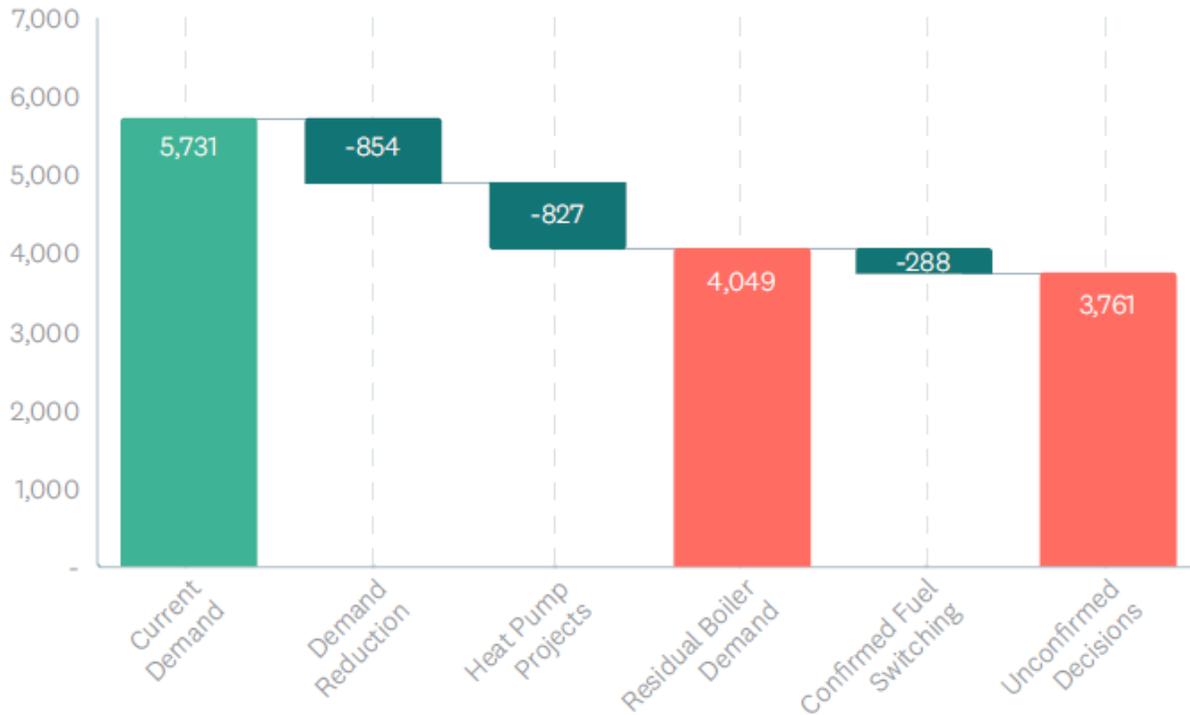
- List of significant process heat sites
- Projected timing and fuel needed for transition
- Electrification infrastructure availability, costs and timing
- Various decarbonisation scenarios:
 - ‘Electricity centric’
 - ‘Biomass centric’
 - ‘MAC optimal’
- Forecast of potential bioenergy availability and accounting for known demands for the resource
- Where additional bioenergy could come from (e.g. in forest, KIS, processor residues)
- Actions needed to unlock it
- Information about cost / price
- Recommendations



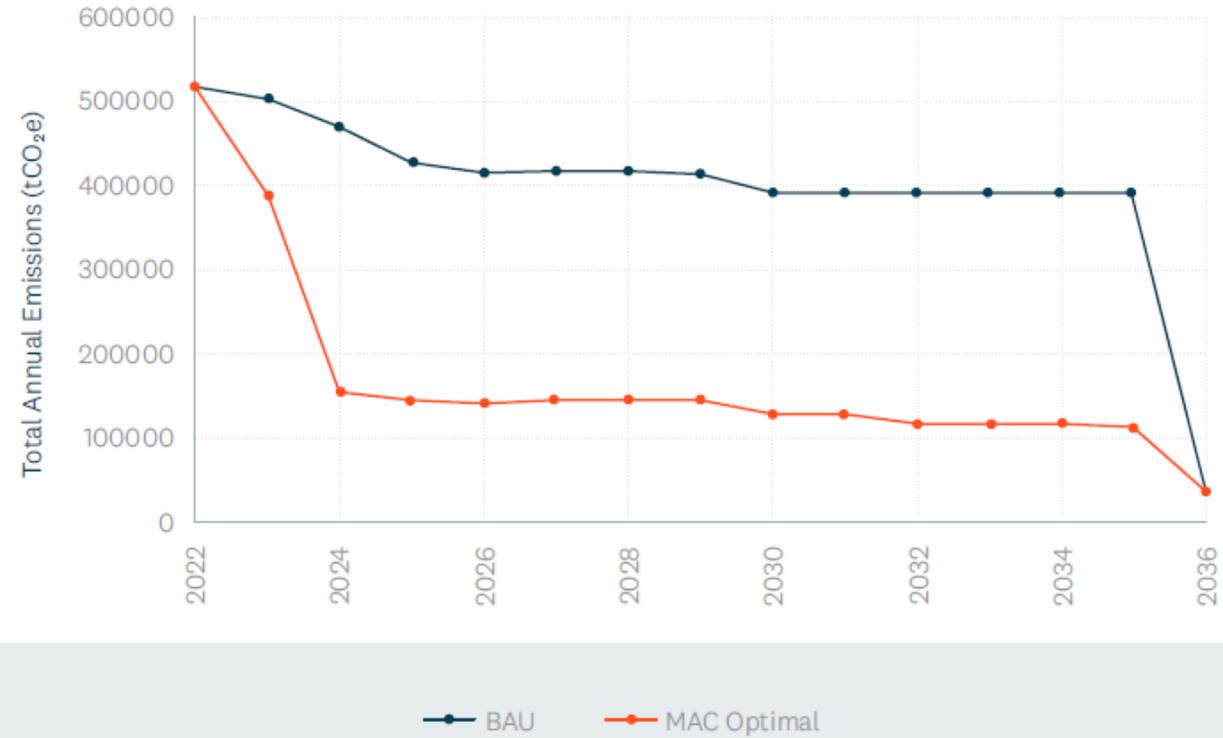
Getting process heat emissions down

Mid-South Canterbury example

Potential renewable process heat energy requirements in Mid-South Canterbury
How RETA projects impact demand for fuels (TJ per annum)



Mid-South Canterbury simulated emissions reduction pathways



Future needs are central to the information shared

Mid-South Canterbury example

- Sites renewable energy requirements and likely renewable option
- Regional energy requirements
 - Biomass availability estimated to be 140,000 'green' tonnes per annum (1,000TJ) average over the next 15 years
 - **58%** of future energy needs supplied by electricity - 2,000 TJ p.a. (209 MW peak demand)
- Regional energy availability
 - Demand for biomass may exceed supply from within the region, so volumes may come from other regions
 - Greater than \$80 Million investment for new connection assets

Site Name	Industry	Project Status	Bioenergy Required in TJ ('000t)	Electricity Peak Demand (MW)
McCain Foods (NZ) Ltd, Timaru	Manufacturing	Confirmed	175 (24.3)	N/A
Makikihi Fries	Manufacturing	Confirmed	13 (1.8)	N/A
Ashburton College	Education	Confirmed	2 (0.3)	N/A
Waitaki Boys	Education	Confirmed	2 (0.2)	N/A
Oamaru Intermediate	Education	Confirmed	1 (0.1)	N/A
Timaru Girls High School	Education	Confirmed	1 (0.1)	N/A
Woolworks NZ, Washdyke	Manufacturing	Confirmed	N/A	9
Canterbury Spinners Ltd, Oamaru	Manufacturing	Confirmed	N/A	3
Fonterra, Clandeboye - Boiler 1	Dairy	Unconfirmed	674 (93.8)	40
Fonterra, Clandeboye - Boiler 2	Dairy	Unconfirmed	556 (77.4)	33
Oceania Dairy Ltd, Oamaru ⁵	Dairy	Unconfirmed	342 (47.5)	26
Fonterra, Clandeboye - Boiler 3	Dairy	Unconfirmed	337 (46.9)	20
Fonterra, Clandeboye - Boiler 4	Dairy	Unconfirmed	337 (46.9)	20
Talleys, Ashburton	Manufacturing	Unconfirmed	221 (30.7)	14
Fonterra, Studholme	Dairy	Unconfirmed	194 (27.1)	16
South Canterbury By Products, Washdyke	Manufacturing	Unconfirmed	141 (19.6)	7
ANZCO Canterbury	Meat	Unconfirmed	133 (18.5)	10
Silver Fern Farms, Pareora	Meat	Unconfirmed	74 (10.3)	8
Alliance Group Ltd, Pukeuri ⁷	Meat	Unconfirmed	71 (N/A ⁶)	8.8

Solutions needed to support electrification are varied

Southland example

Site	Transpower GXP	Network	Peak site demand (MW)	Total cost (\$m) ⁶⁵	Timing
Alliance Mataura	GOR	TPC	4	\$0.12	2-4 months
Ascot Park Motels	INV	EIL	1.6	\$0.57	3-6 months
Balclutha swimming pool	BAL	OJV	0.6	\$0.20	3-4 months
Blue Sky Meats	EDN	TPC	4.1	\$3.70	12-18 months
Downers Roding Invercargill	INV	EIL	1.4	\$0.40	3-6 months
Fiordland Hotel	NMA	TPC	0.13	\$0.08	2-4 months
Great Southern Invercargill	INV	EIL	0.9	\$1.08	3-6 months
Great Southern Milton	BAL	OJV	0.9	\$0.20	3-4 months
ILT Stadium Southland	INV	EIL	0.9	\$0.99	12-18 months
Invercargill Prison	INV	EIL	1.3	\$0.40	3-6 months
Fonterra Edendale	EDN	TPC	85	\$54.50	36-48 months
Silver Fern Farms Finegand	BAL	OJV	8	\$12.65	24-36 months

EnergyLink retail electricity price forecast

Annual average prices; Real \$2022

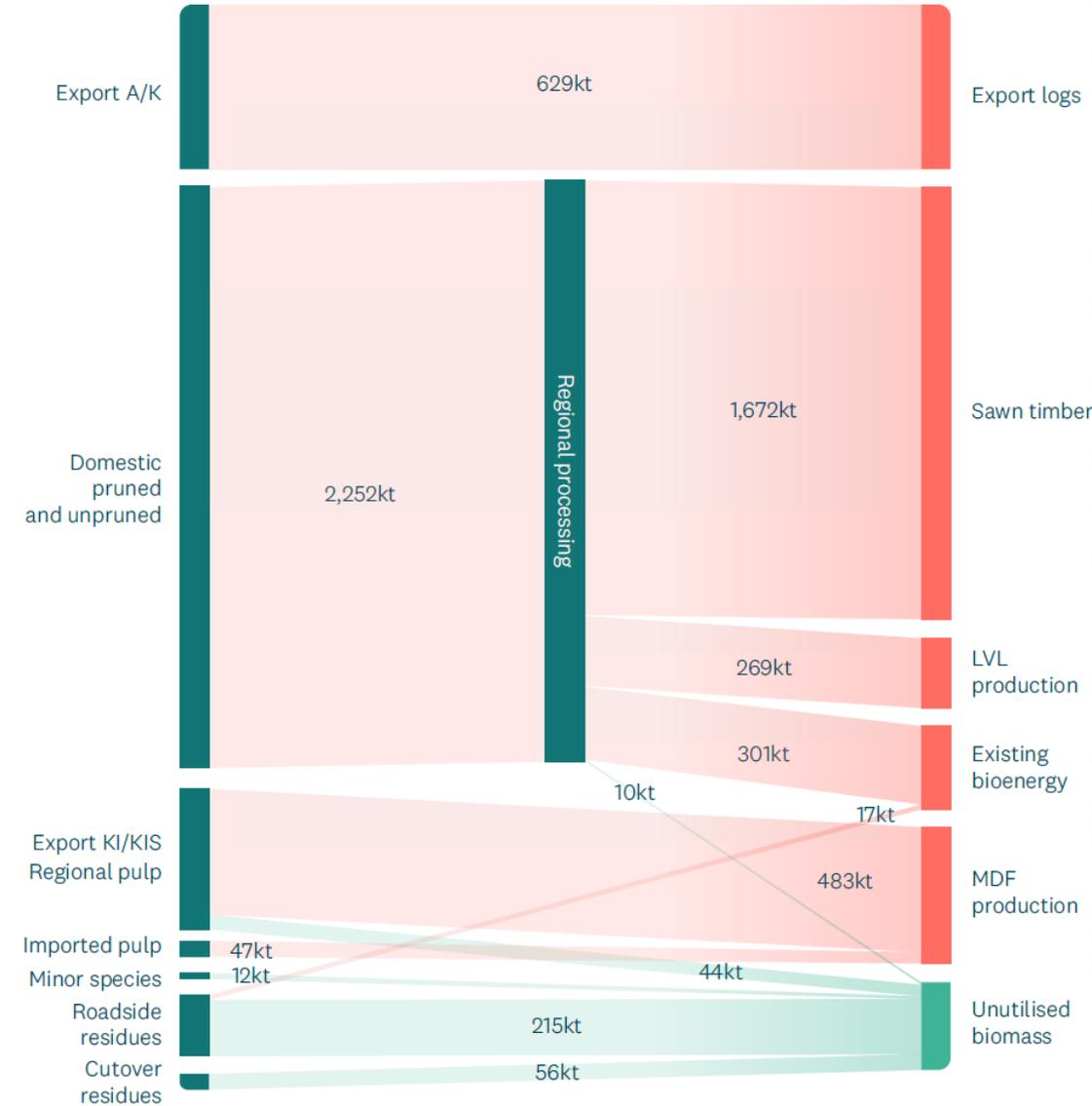
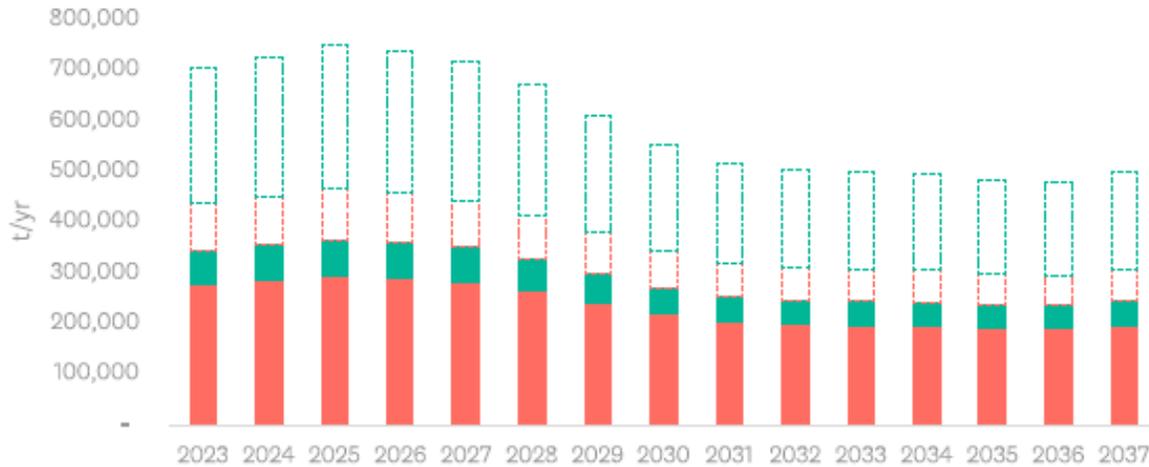


Assessing realistic biomass availability

Nelson, Marlborough, Tasman example

Estimated in-forest residues

Green tonnes per year

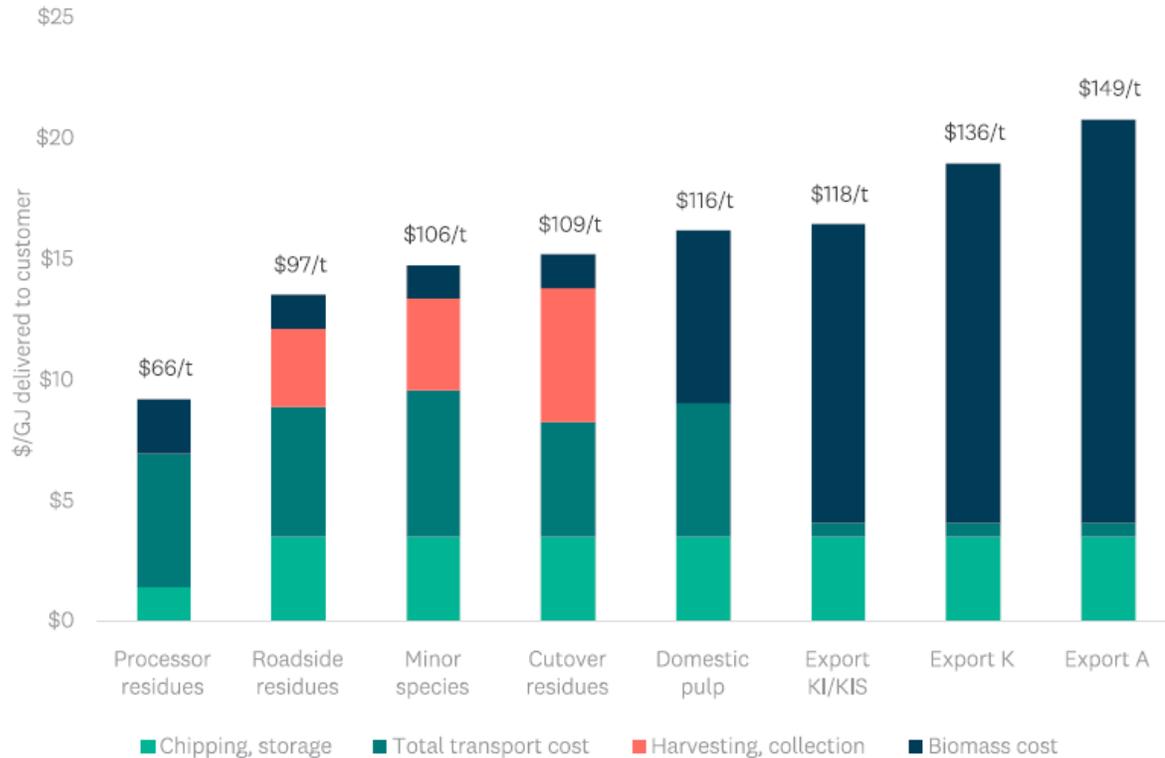


Cost of biomass sources

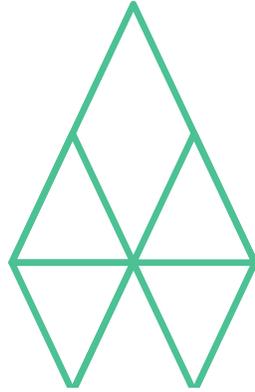
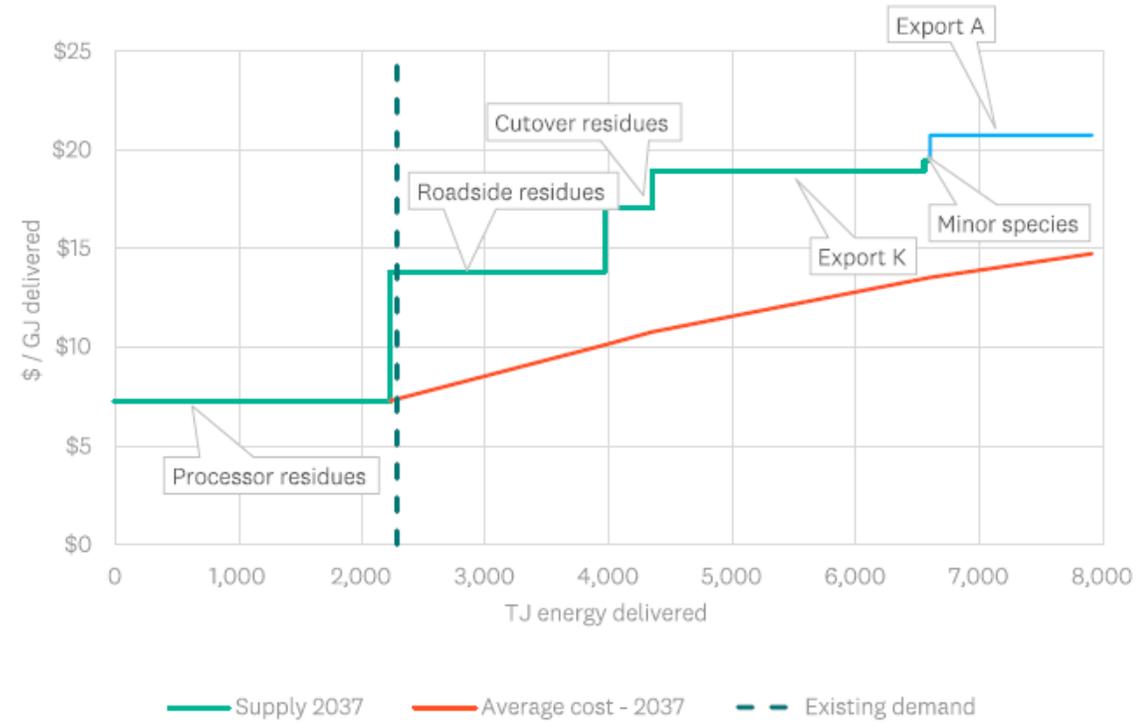
Nelson, Marlborough, Tasman example

Estimated delivered cost of potential bioenergy sources

\$/GJ (\$/green tonne in labels)

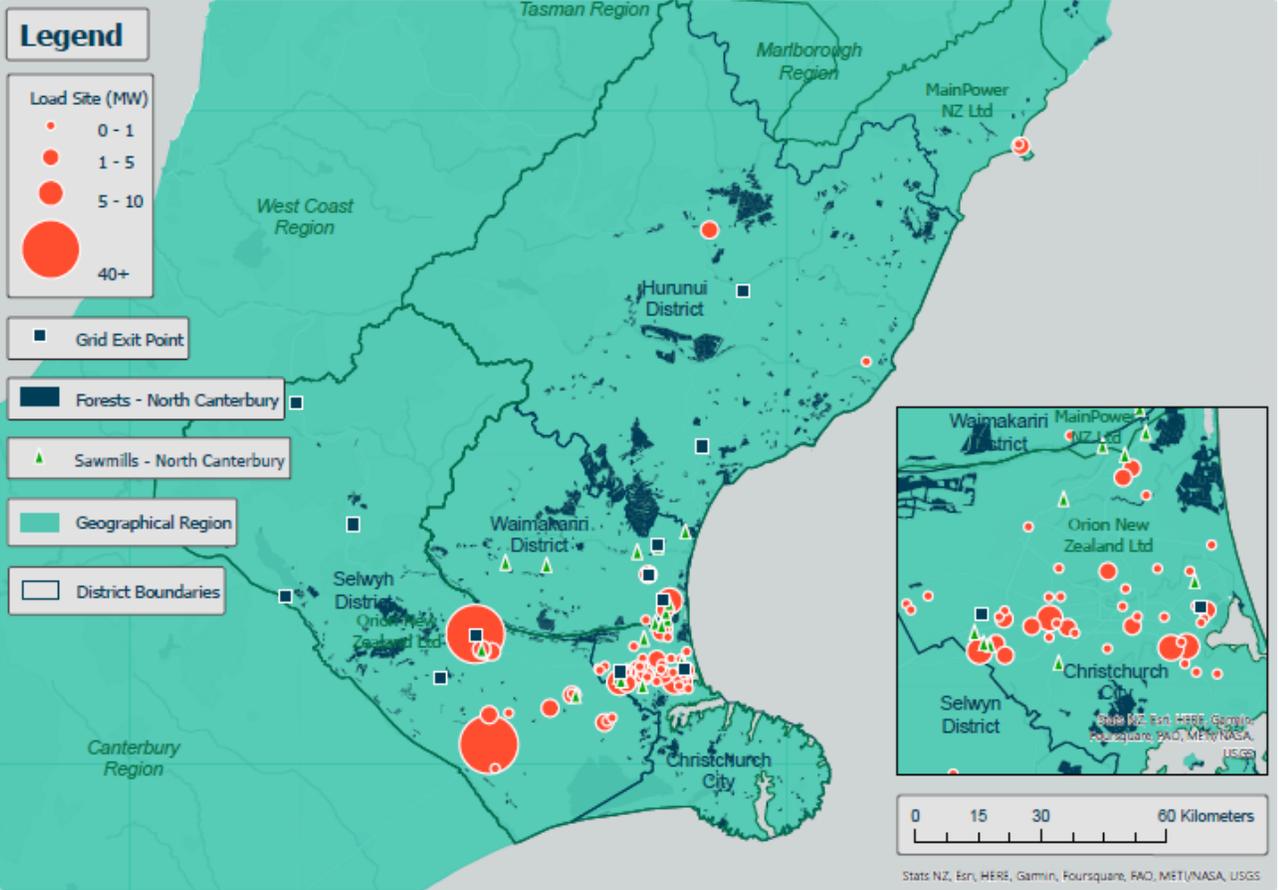


Biomass supply curve - 2037



Sizeable opportunity for biomass

North Canterbury example



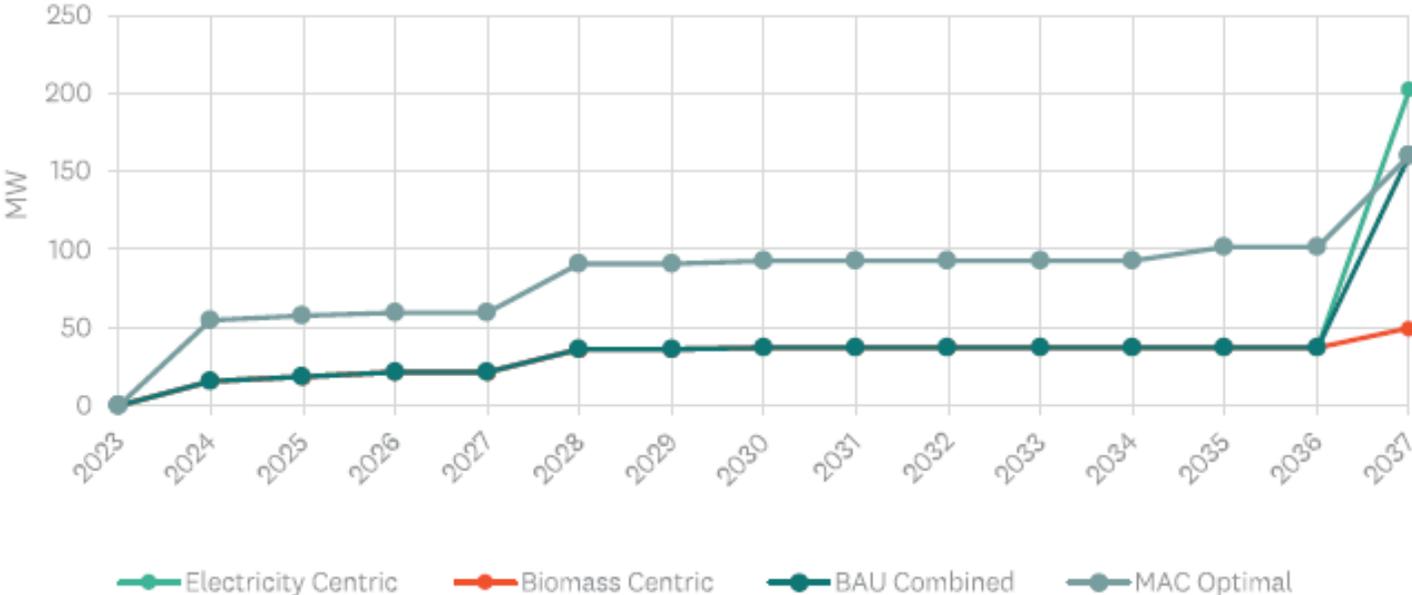
- 150,000 tonnes per year (MAC optimal)
- 400,000 tonnes per year (biomass centric)



Significant growth in electricity demand

North Canterbury example

North Canterbury pathways - additional peak electricity demand
MW



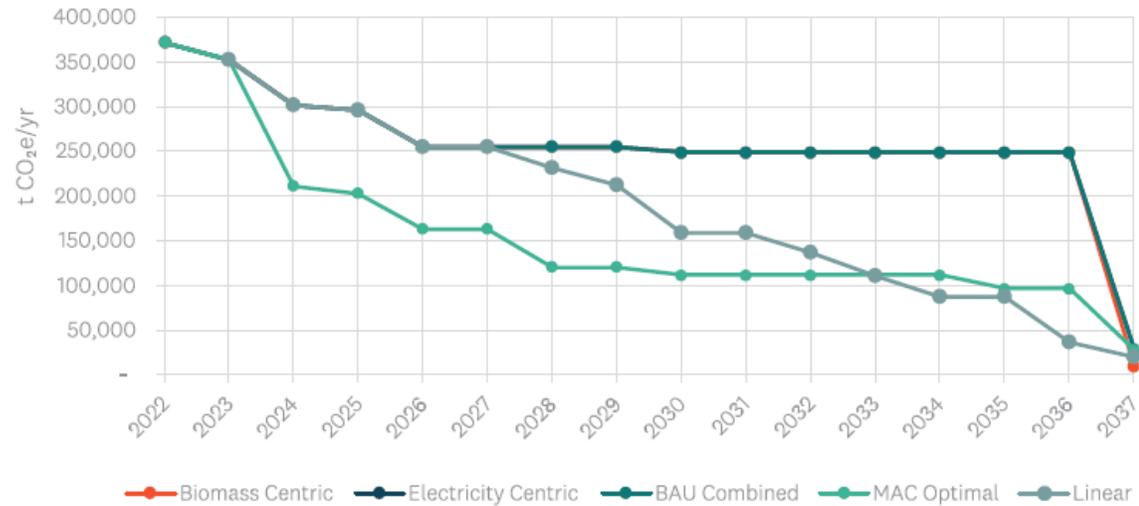
- Up to **+200 MW** network demand (electricity centric); **+26%** increase in coincident maximum demand
- **+500 GWh p.a.** electricity consumption; **+12%** current regional consumption



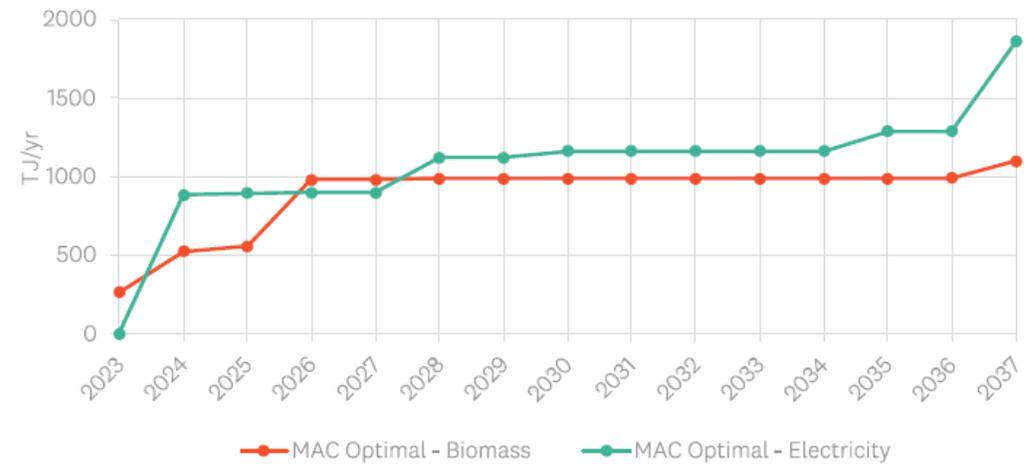
Better information can accelerate decarbonisation

North Canterbury example

North Canterbury pathways – process heat emissions reductions
t CO₂e per year

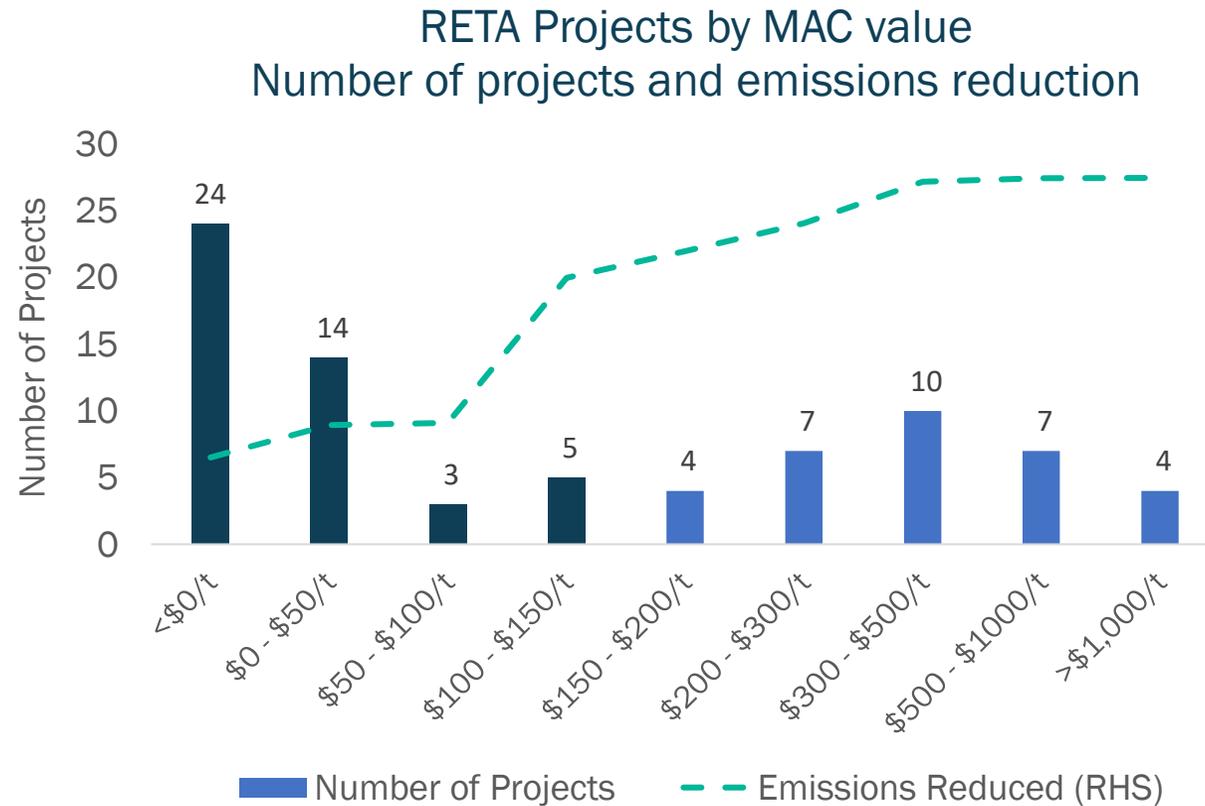


North Canterbury pathways – electricity vs biomass demand
t CO₂e per year

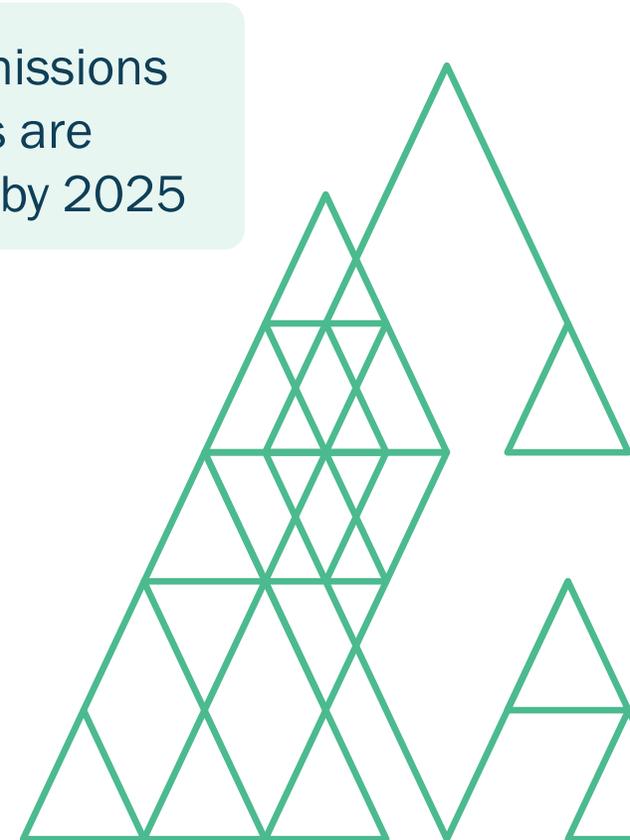


Project economics highlights the opportunity

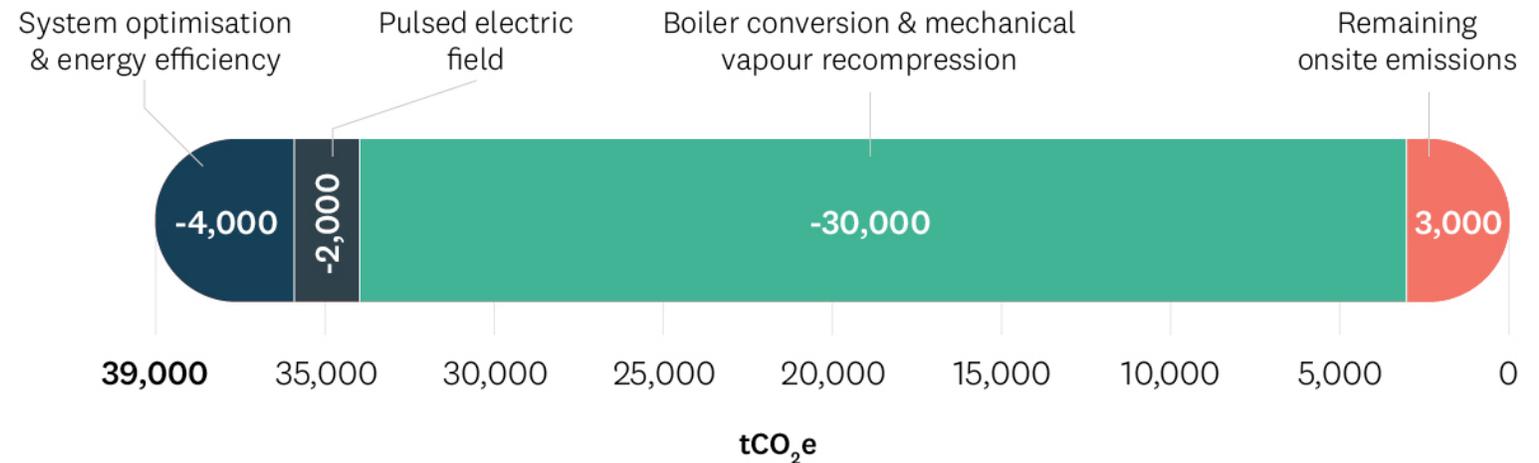
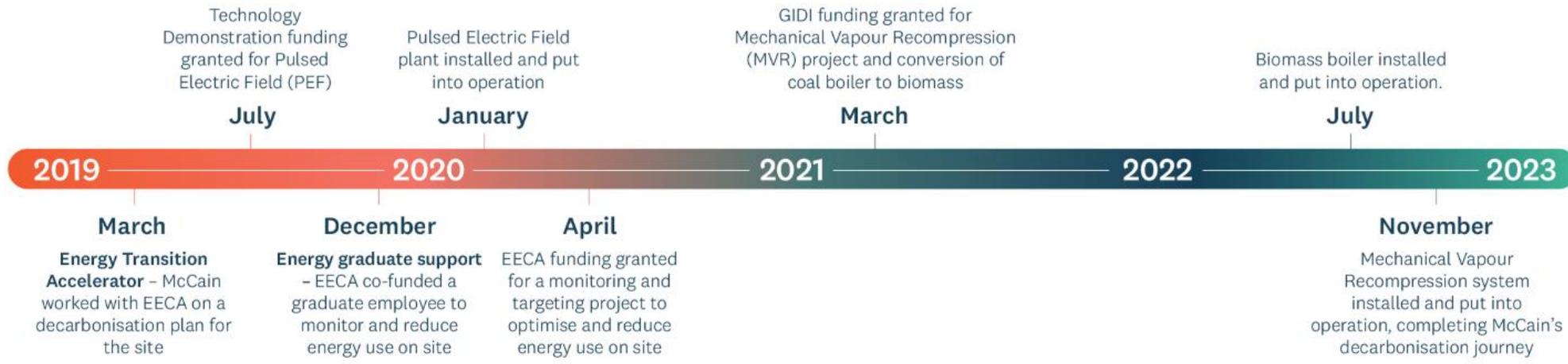
North Canterbury example



75% of emissions reductions are economic by 2025

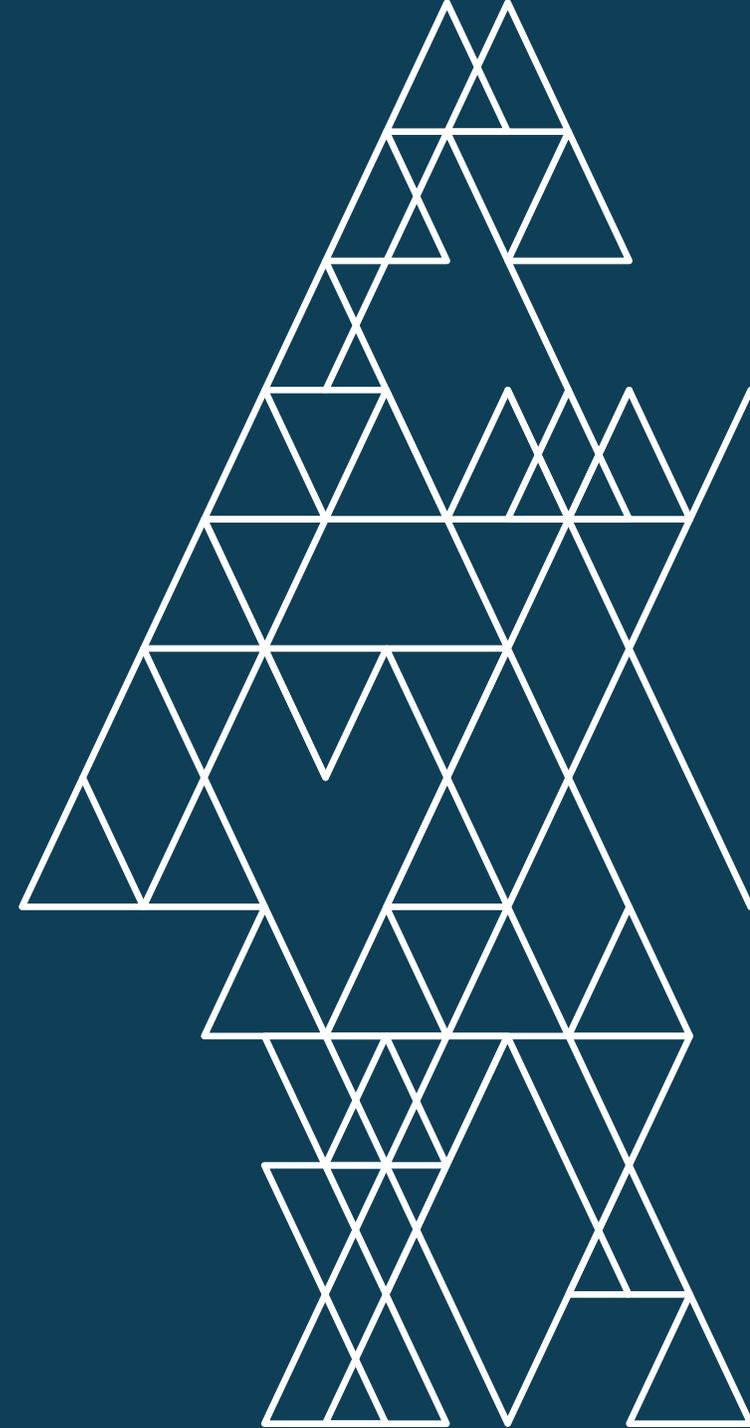


McCain's journey demonstrated the successful implementation of a strategic pathway



Waikato Stationary Heat:

Early look at what we know

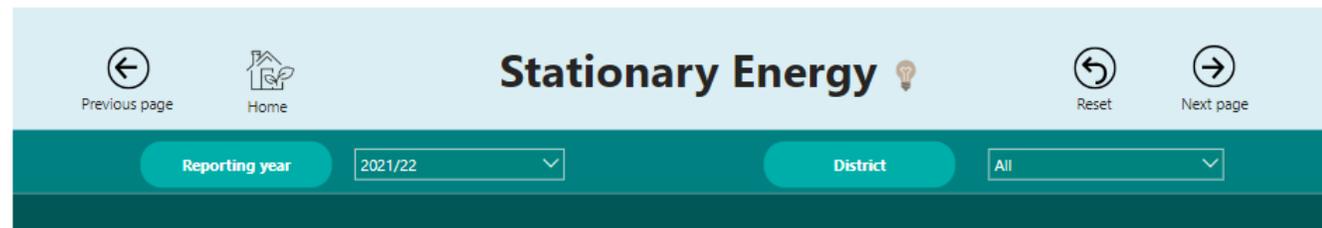


Stationary energy 15% of regional gross emissions[^]

WRC inventory, ~900 kt CO₂-e emissions from “industry”; of this ~600 kt CO₂-e is from burning of fossil fuels.

RETA will address the large sources of fossil fuelled stationary heat, which will be within the areas highlighted here

Waikato Region Greenhouse Gas Inventory Dashboard



Stationary Energy

Reporting year: 2021/22 | District: All

Total Emissions

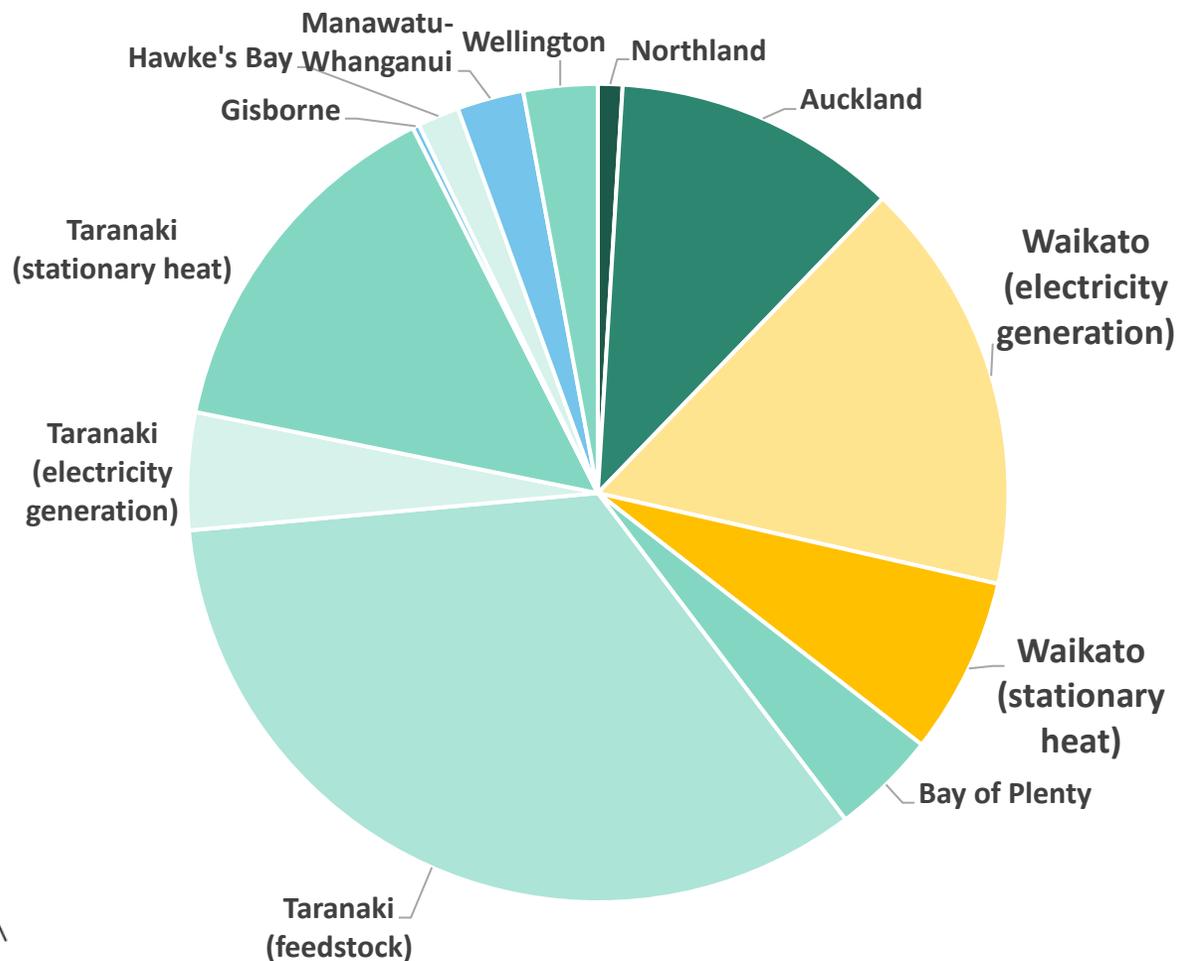
1,514,506 t CO₂ equivalent

Total Emissions Summarised

Total GDC Consumption	-	435,381	t CO ₂ equivalent
Total Transmission and Distribution	-	35,751	t CO ₂ equivalent
Total Electricity Consumption	-	471,132	t CO ₂ equivalent
Residential Total	-	68,627	t CO ₂ equivalent
Commercial Total	-	77,356	t CO ₂ equivalent
Industrial Total	-	897,392	t CO ₂ equivalent

Waikato 23% NZ's piped gas demand

~9,400 TJs p.a. for stationary heat (excluding electricity generation)



Waikato RETA fossil fuelled sites - indicative

- ~90 sites
- ~600 kt CO₂-e p.a. emissions
- ~700 MW installed capacity
- ~11,000 TJs (3,000 GWh p.a.) stationary heat fossil fuel consumption
- Piped gas main fossil fuel source
- Plenty of recent & planned decarbonisation projects:
 - Open Country Dairy Waharoa, conversion to biomass
 - Fonterra Te Awamutu, Waitoa, and Hautapu, conversion to biomass
 - Donelly Sawmillers, biomass boiler
 - AFFCO Horotiu, biomass boiler
 - Hautapu Pine, conversion to biomass
 - Lilies Limited, hot water heat pumps
 - *Others??*



Now we want to hear from you all!



Regional perspectives on decarbonising stationary heat

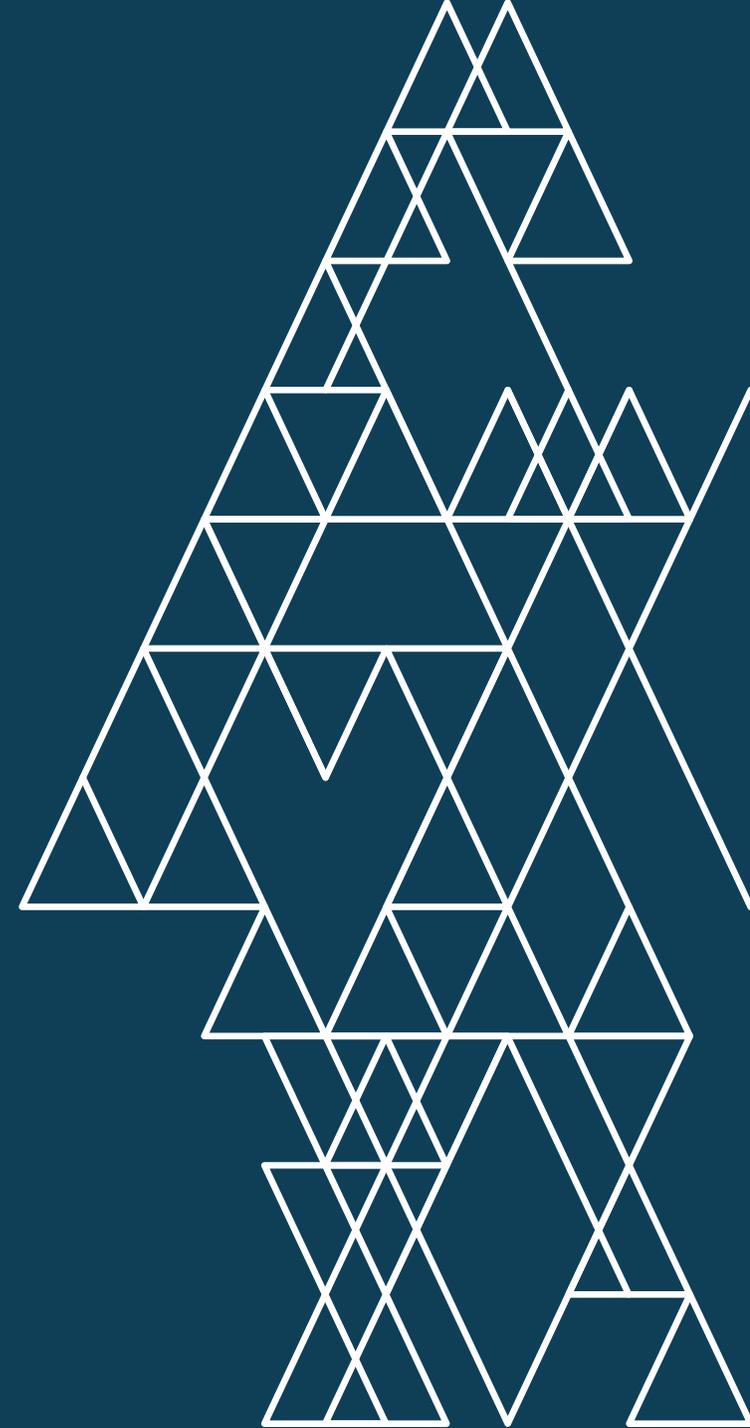
Part one: amongst your table

- Introduce yourself: name and organisation
- Demand side, supply side, or other interest?
- Progress made on decarbonisation; where are you at on the journey?
- Opportunities? Barriers?
- What help / information do you need?
- Any information you want to give to the people in the room?
- Nominate a scribe to report back

Part two: report back on the themes from your table



Closing remarks and next steps



Waikato indicative timing

- Workstream analysis for Waikato is underway, to be completed around July
- Second stakeholder workshop presenting insights from the workstreams around July / August
- Integrated report published publicly around September / October



The EECA team would love to hear from you

Further information, questions, concerns, comments:

RETA Programme:

- Oliver Howitt – RETA Programme Lead
oliver.howitt@eeca.govt.nz

Biomass / bioenergy:

- Rob McBrearty – Biomass Industry Development Lead
rob.mcbrearty@eeca.govt.nz

Small to medium business support:

- Ben Pitt – SME Account Manager
ben.pitt@eeca.govt.nz

Ngā mihi

