Flex Day: Flexibility – Progress, Gaps, and Engaging Consumers

Workshop

9th September 2025

FLEXFORUM

eea Electricity Engineers' Association

EECA
TE TARI TIAKI PŪNGAO
ENERGY EFFICIENCY & CONSERVATION AUTHORITY

Welcome

MC Toby Stevenson

9.10am The state of play – Steve Batstone (FlexForum)

9.30am EECA update, Demand Flexibility Projects – Brian Fitzgerald (EECA)

9.45am DF Quick bite 1 – Keith Scoles (Alpine Energy)

10.00am DF Quick bite 2 – Simon Rycroft (Orion)

10.15am WBOP Project - Michael Richardson (Transpower) and Ryno Verster (Powerco)

10.35am DF Quick bite 3 – Matt Smith (Vector)

10.50am Morning Tea

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FlexForum – The State of Play

Steve Batstone – FlexForum / Whiteboard Energy

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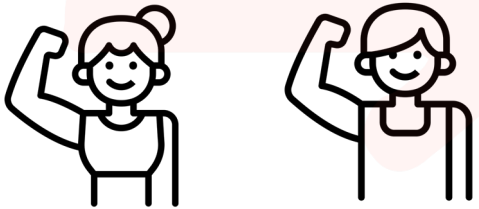
Flexibility state of play

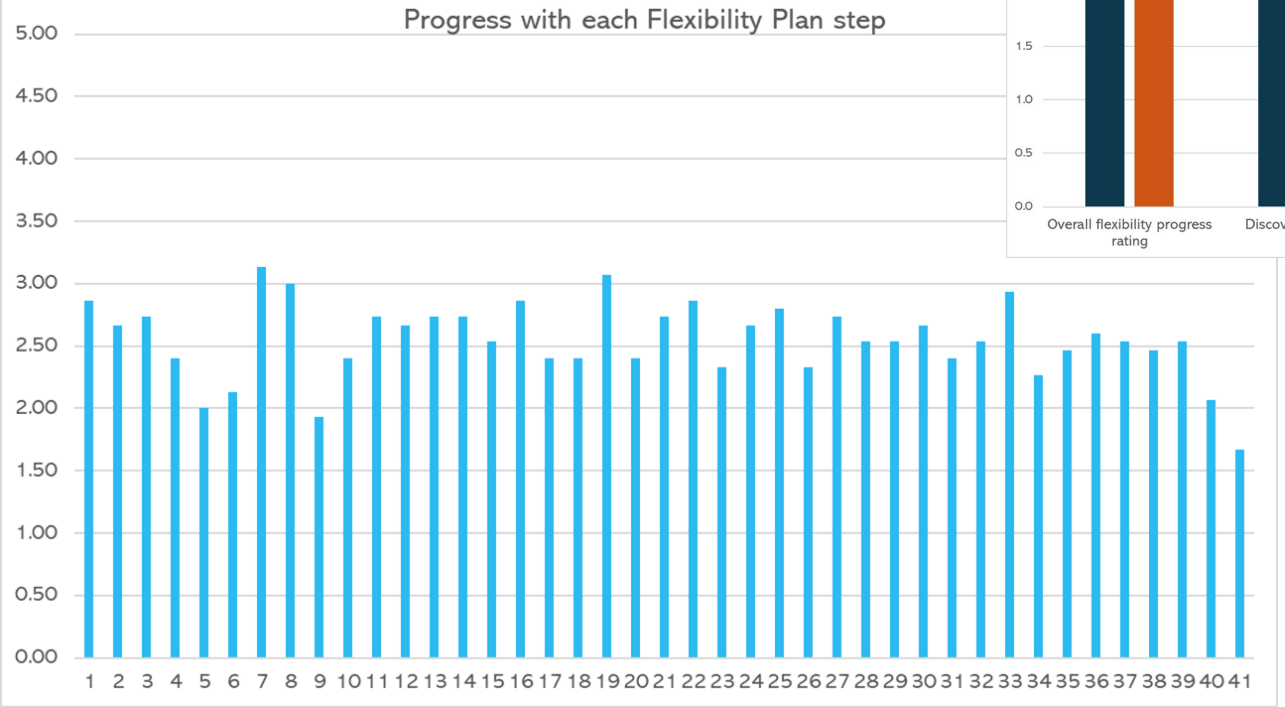
…flexibility progress in September 2025

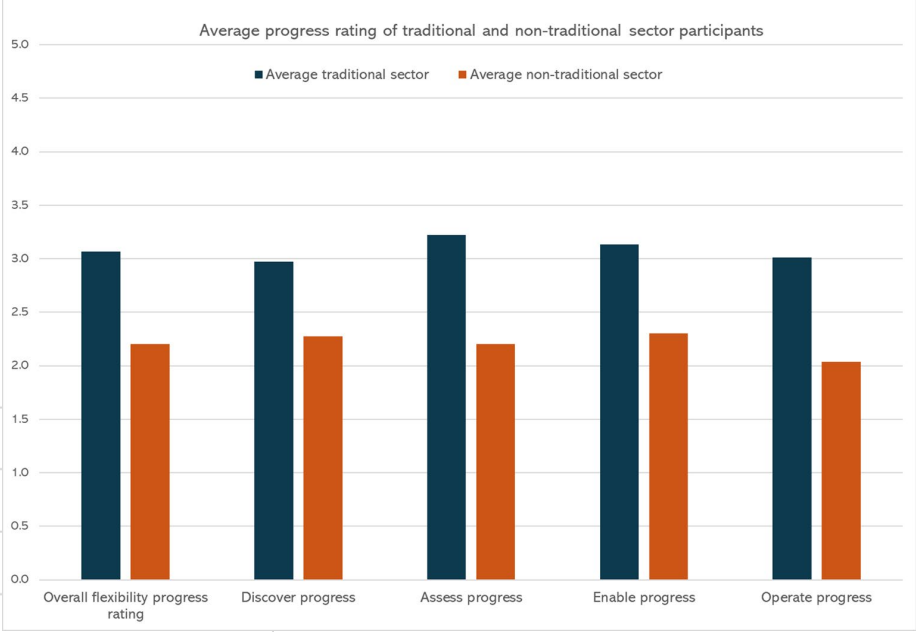
9 September 2025



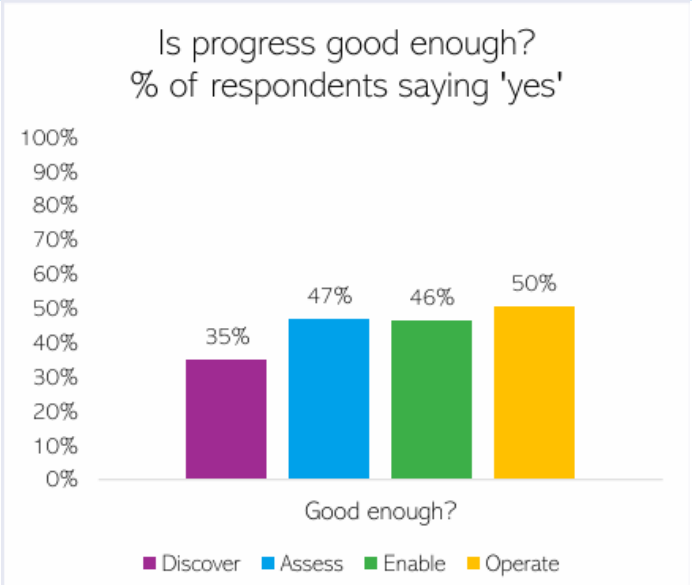
The flexibility customer journey - recap

Flexibility progress gets a pass mark

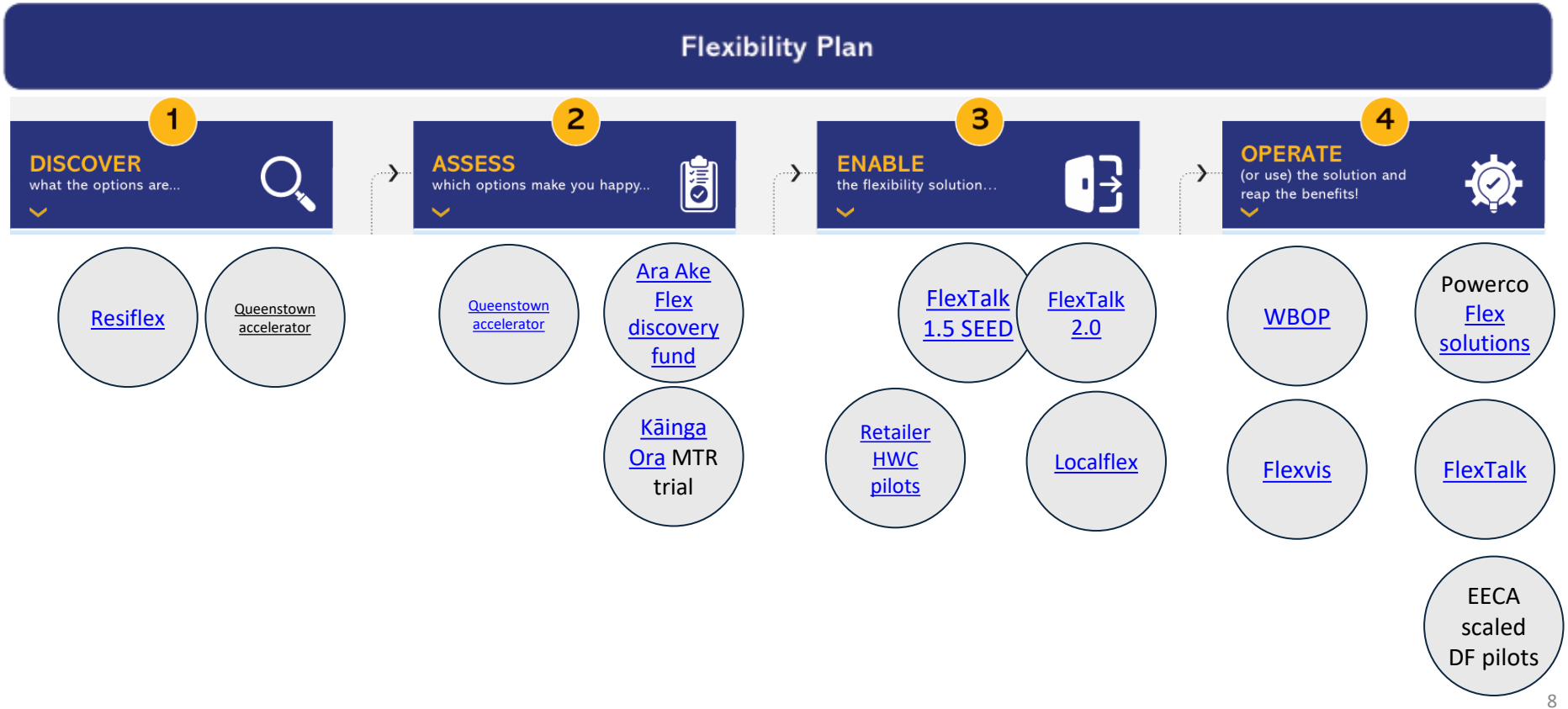




The flexibility customer journey – where are we focusing?

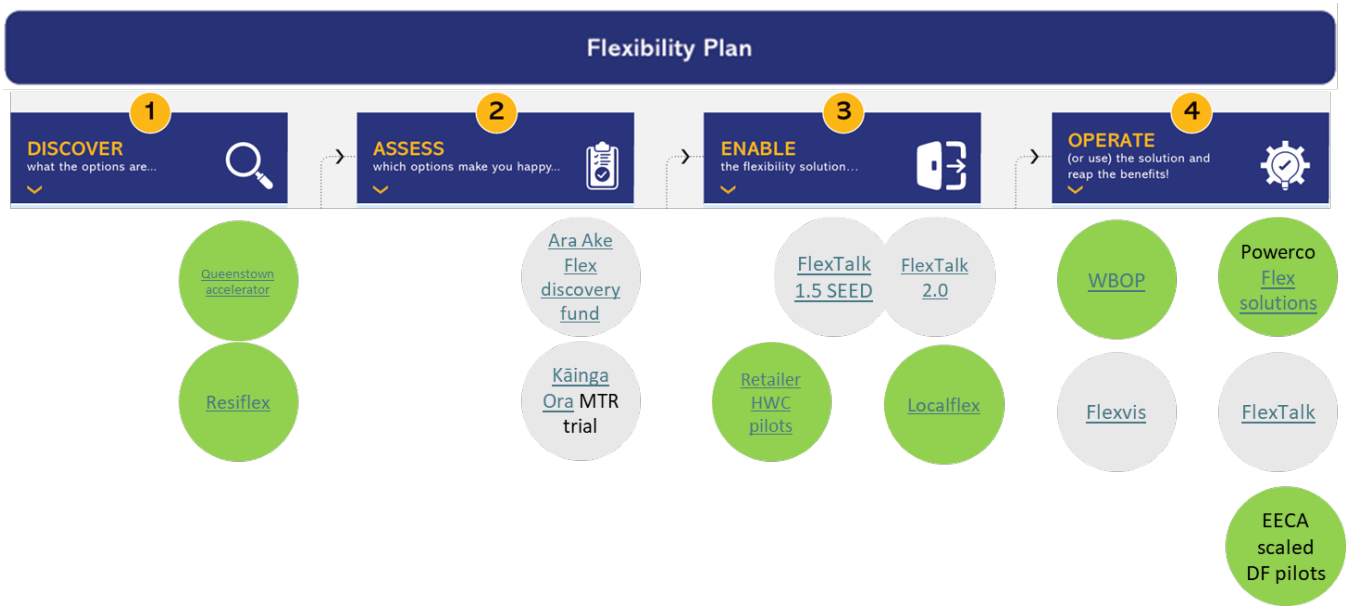


Learning-by-doing is increasing

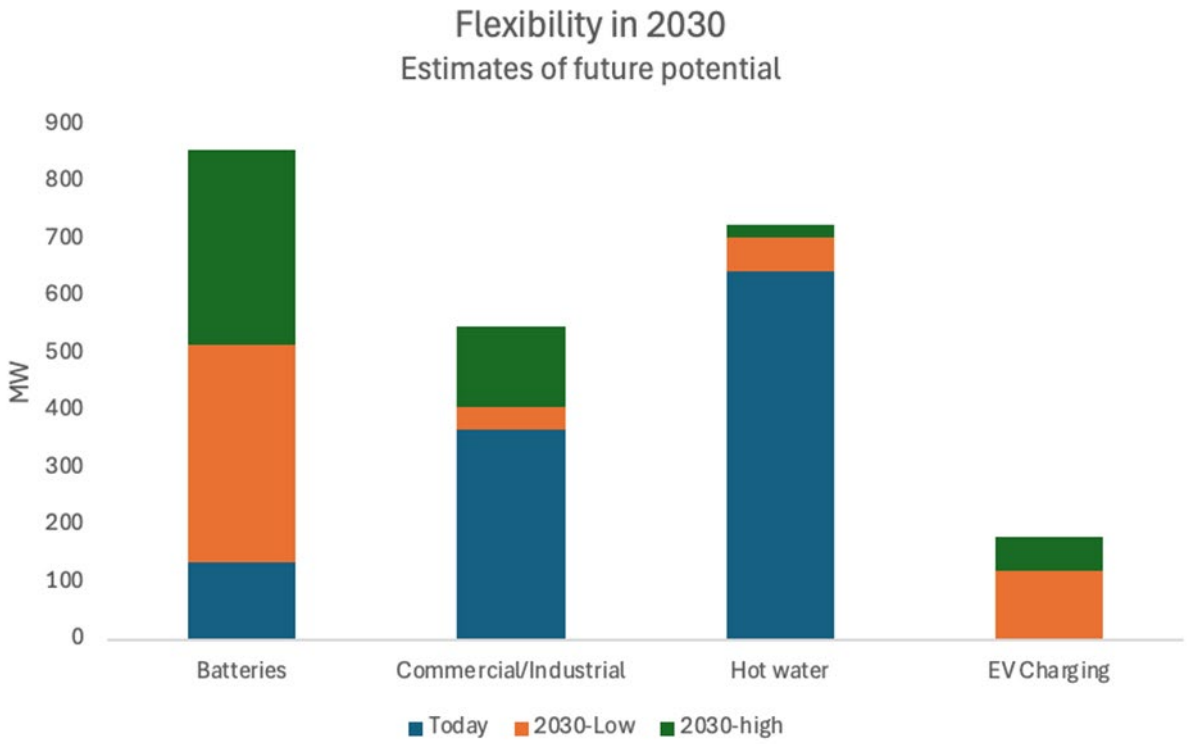


We have multiple trials, pilots and flex procurement underway

Several flexibility projects kicking off provides an opportunity to lay solid foundations for more flexibility propositions , eg, Local Flex, Western Bay of Plenty flexibility programme, Queenstown accelerator and the various EECA scale demand flexibility projects.



Where's the puck going to be?



“If we knew what we were doing, it wouldn’t be called ~~research~~ a pilot, would it?”

– Albert Einstein

“We absolutely must leave room for doubt or there is no progress and no learning.”

– Richard Feynman

“If I could borrow the bits the other EDBs had already figured out, I'd know where to focus my pilot design.”

– GM Future Energy, New Zealand EDB.

Let's learn together

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EECA: Demand Flexibility Projects

Brian Fitzgerald - EECA

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Smart technology in a smart grid

EECA's role in delivering distributed flexibility at pace and scale

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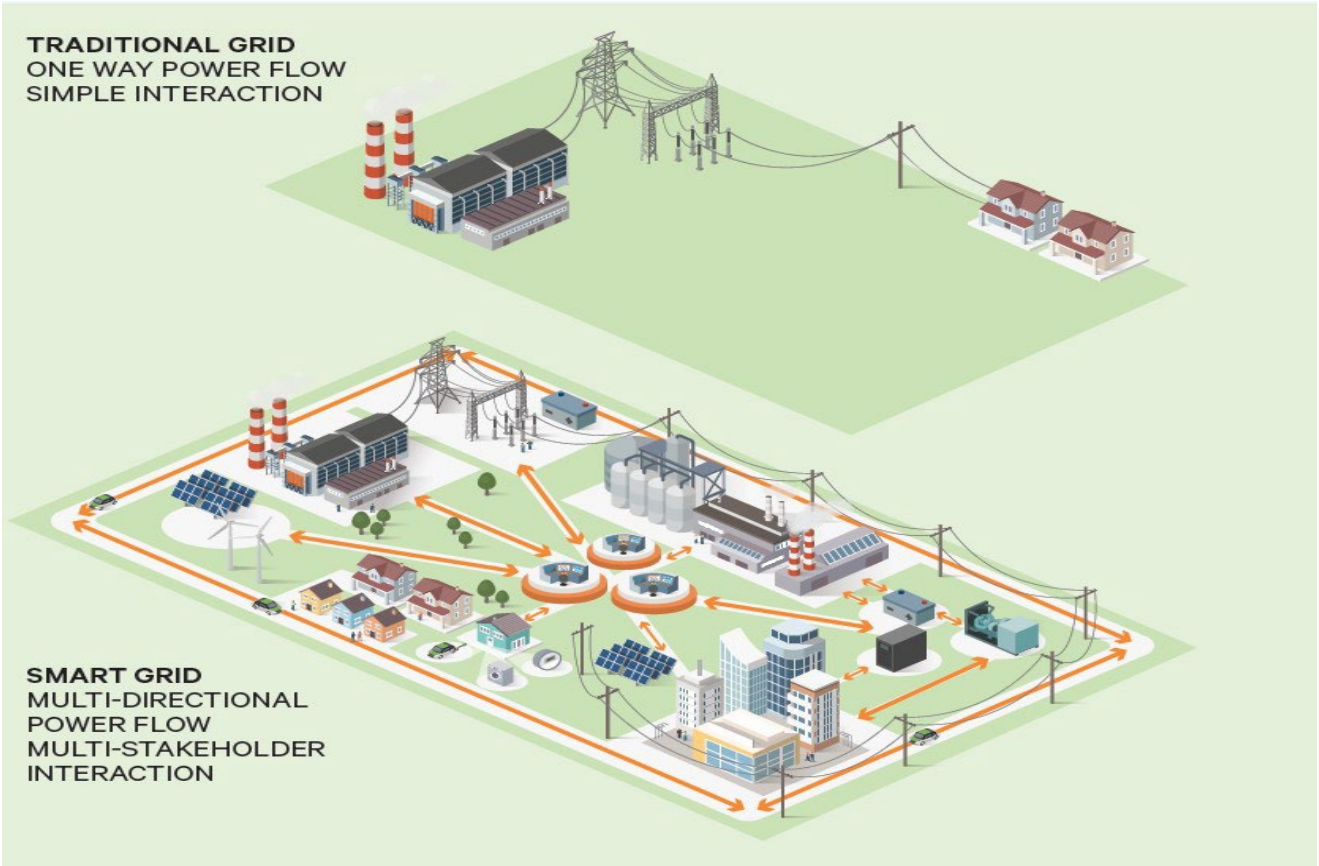
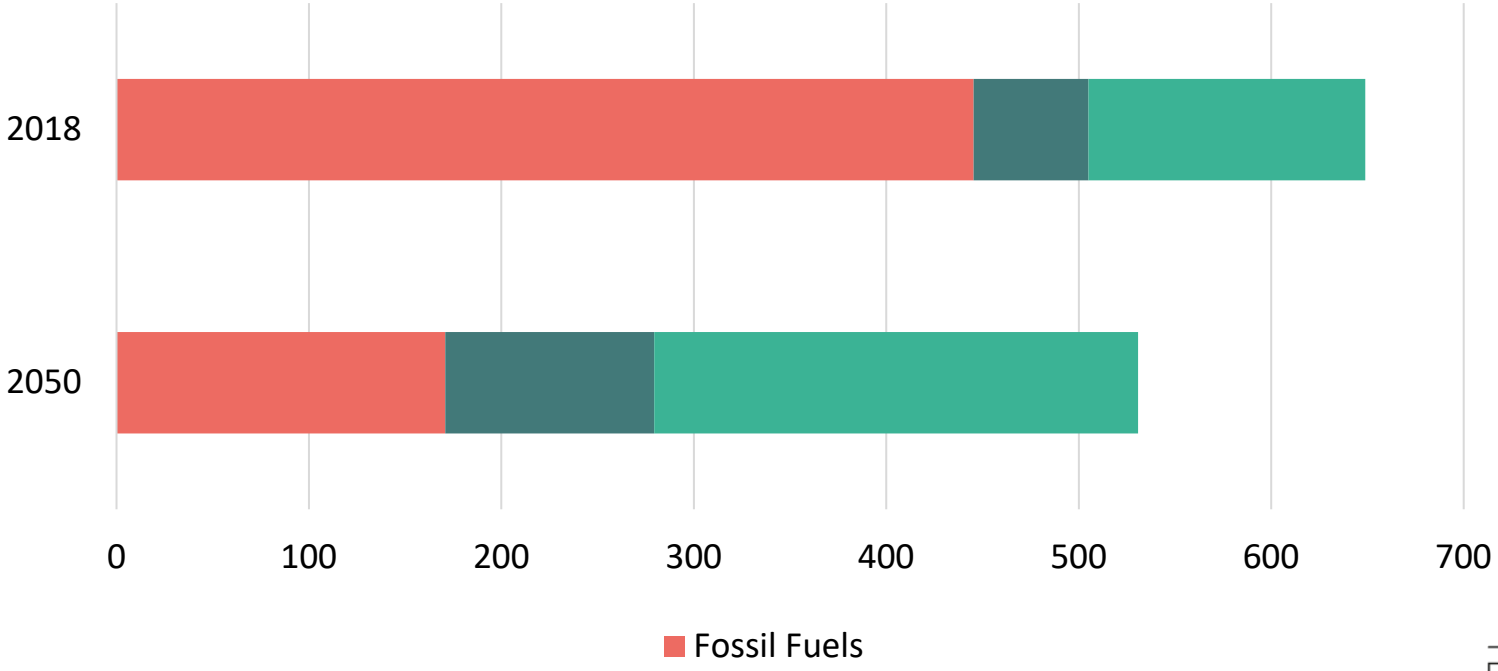

TRADITIONAL GRID
ONE WAY POWER FLOW
SIMPLE INTERACTION
SMART GRID
MULTI-DIRECTIONAL
POWER FLOW
MULTI-STAKEHOLDER
INTERACTION

The importance of electrification

End-use fuel consumption [PJ] in 2018 and 2050



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

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.

Distributed flexibility

Our goal

All energy users are:

Equipped to understand and manage their energy use

Adopting smart energy solutions

Able to operate within a secure and flexible electricity system

EECA

Distributed Flexibility

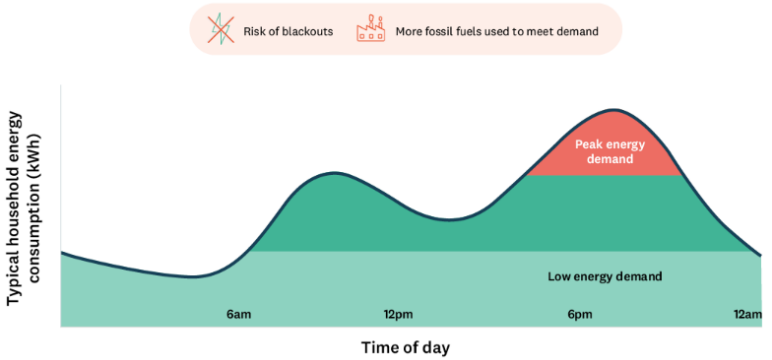
EECA's mission is to mobilise New Zealanders to be world leaders in clean and clever energy use

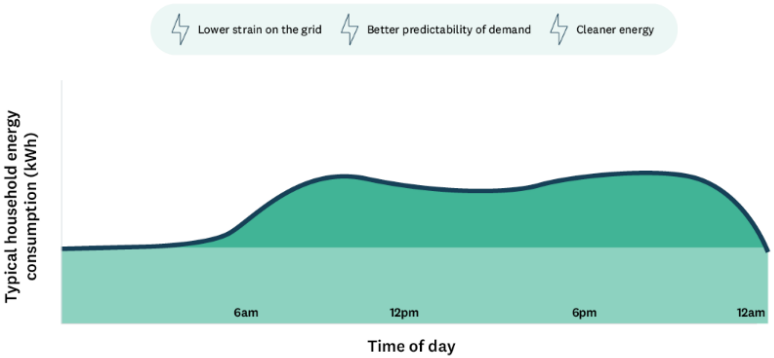
Electricity prices are set to increase

- Gross electricity demand is projected to increase 26% by 2035 and 65% by 2050.
- To electrify NZ's economy, the energy sector estimates $42 billion in electricity infrastructure investment is required by 2030.
- To help pay for this, household electricity bills are expected to increase by $120-$240 annually over the next 5 years.

What does Distributed Flexibility offer?

- Empower households & businesses to:
  - Save on their energy bills by optimising their energy use, reducing their peak electricity price exposure.
  - Lessen their reliance on the grid by generating, storing and using their own renewable electricity.
- Enable electrification & renewable energy generation by relieving intermittent supply and peak demand challenges at the grid level.
- Defer or reduces significant expensive infrastructure upgrades by optimising existing electricity network demand capacity.
- Transpower estimates every GW of peak demand avoided could save consumers approximately $1.5 billion. By 2050, a smarter, more flexible electricity system is estimated to be able to save ~$10 billion.





What is demand/distributed flexibility?

Definition the ability of consumers users to adjust electricity consumption in response to grid conditions, energy prices, or sustainability goals.

Key components

Load Shifting	moving energy-intensive activity to off-peak times
Peak Shaving	reducing demand during peak price periods
Demand Flex (DF)	participating in programs where consumers get paid to reduce load
Storage & On-Site Generation	using batteries or alternative generation to optimize costs

Why is distributed flexibility important?

1. Cost reductions

- Smart technology able to be seen (and with explicit consent) controlled, can steer load outside of peak periods
- Demand side load can be orchestrated to optimise efficiency and relieve network congestion - reducing infrastructure overinvestment and keeping downward pressure on electricity pricing

2. Improve grid stability = improved resilience

- As NZ transitions to **100% renewable electricity**, demand-side flexibility helps avoid supply challenges in dry years or during low wind and/or sunshine periods

3. Revenue streams

- A New Zealand's demand flex market will allow consumers to earn money by reducing demand during peak times (ToU tariffs) and supplying stored electricity back into the grid at peak times

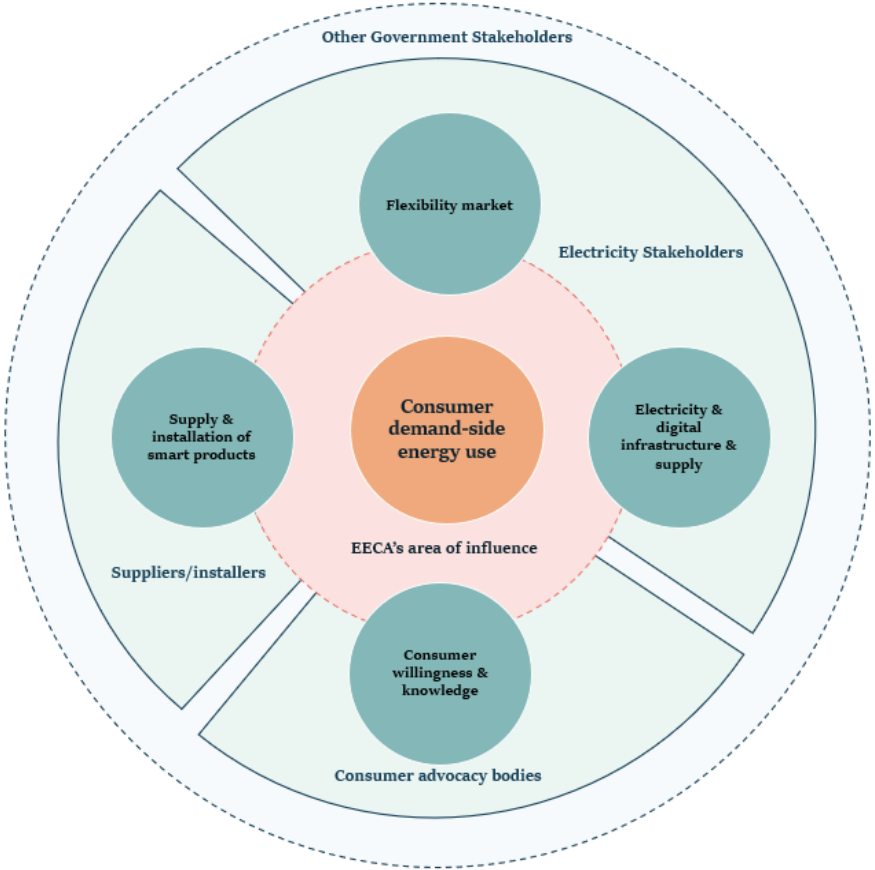
Demand Flexibility in NZ –size of the prize

Jacobs/EECA research will be presented during the EEA conference

Initial indications are that up to 2,500 GWh (~6% of total electricity use) of potentially useful demand flexibility is available in NZ

Current intra-day industrial potential has been recently estimated at 170 MW, along with 600-700 MW of residential hot water

The economically deployable amount is less than this, and depends on both the cost of flexibility, and the compensation available.


Other Government Stakeholders
Flexibility market
Electricity Stakeholders
Supply & installation of smart products
Consumer demand-side energy use
Electricity & digital infrastructure & supply
EECA's area of influence
Suppliers/installers
Consumer willingness & knowledge
Consumer advocacy bodies

FlexTalk 2.0 Overview

Our partners & customers

the lines company

Cortexo
Everything Connected

ivoryegg.

flextalk

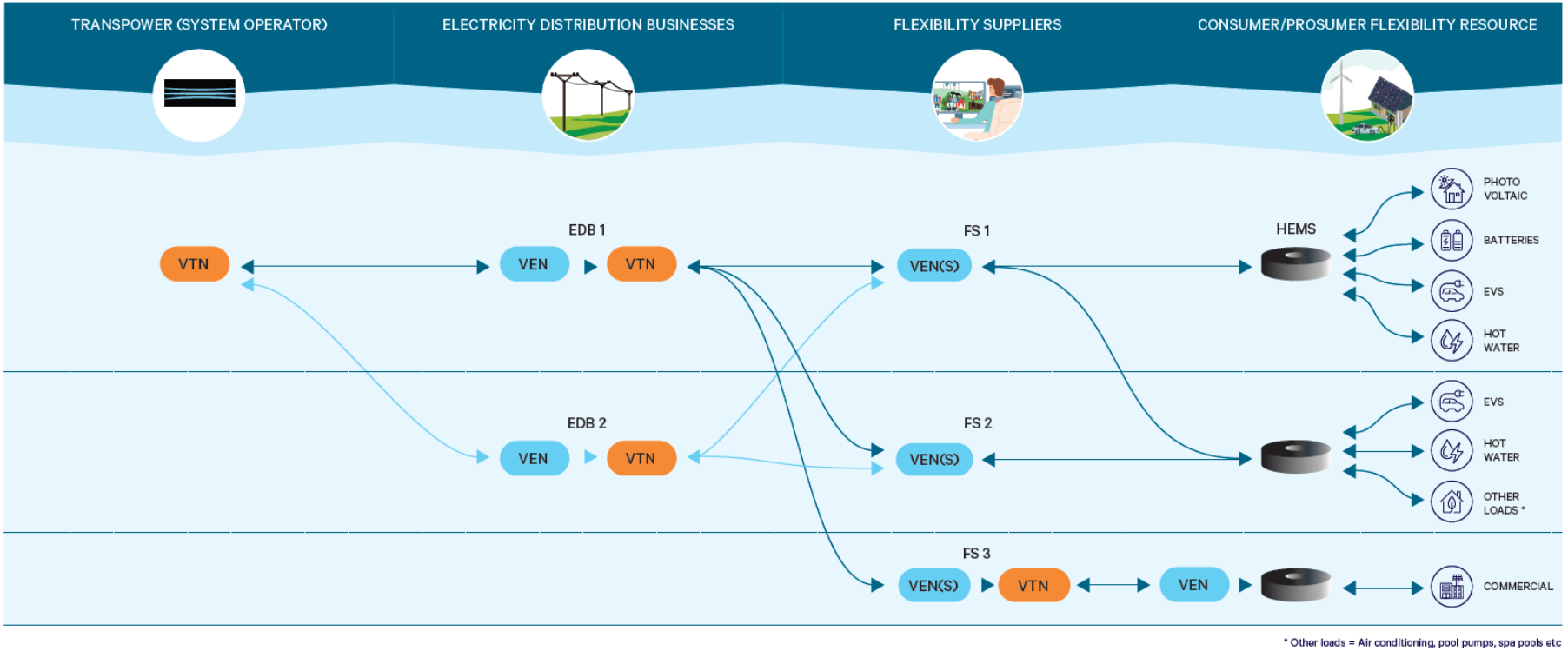
EECAs Approach

Building the foundation – FlexTalk 1.0
Demand Flexibility common communications protocols project (EDB to flex supplier)

Small scale test FlexTalk 1.5
Seed Project (Supplier to device)

Scaling up FlexTalk 2.0 Smart Energy Use
Retrofitting 140 homes with smart devices, installing standardised connectivity and testing interoperability

OpenADR Tree Structure



* Other loads = Air conditioning, pool pumps, spa pools etc

flextalk

Scaled Distributed Flexibility (DF) Pilots 2025-2028

- **Building on evidence from FlexTalk ‘proof of concept’ trials – moving to market based scaled pilots**
- **5-6 pilots around NZ targeting 500 household cohorts, commercial and industrial**
- **Provide evidence to electricity supply businesses that DF solutions can be used to defer, delay or avoid network upgrades**
- **Use the electricity demand reduction obtained to improve security of supply**
- **Provide evidence to consumers that DF can significantly reduce their energy costs, and they should be looking for retailers or DF service providers who offer DF services**
- **Ongoing focus on retrofitting ‘smart’ connectivity capability to existing homes to scale the DF opportunity as quickly as possible - but lessons learned will also inform longer term regulatory work post EEC Act amendment**
- **Technologies for deployment include home batteries (for homes with solar fitted), V2G EV chargers, community level batteries, smart appliances (retrofitted water and space heating) and for in home device orchestration home energy management systems**

DF Scaled Pilot – Alpine Energy

Keith Scoles

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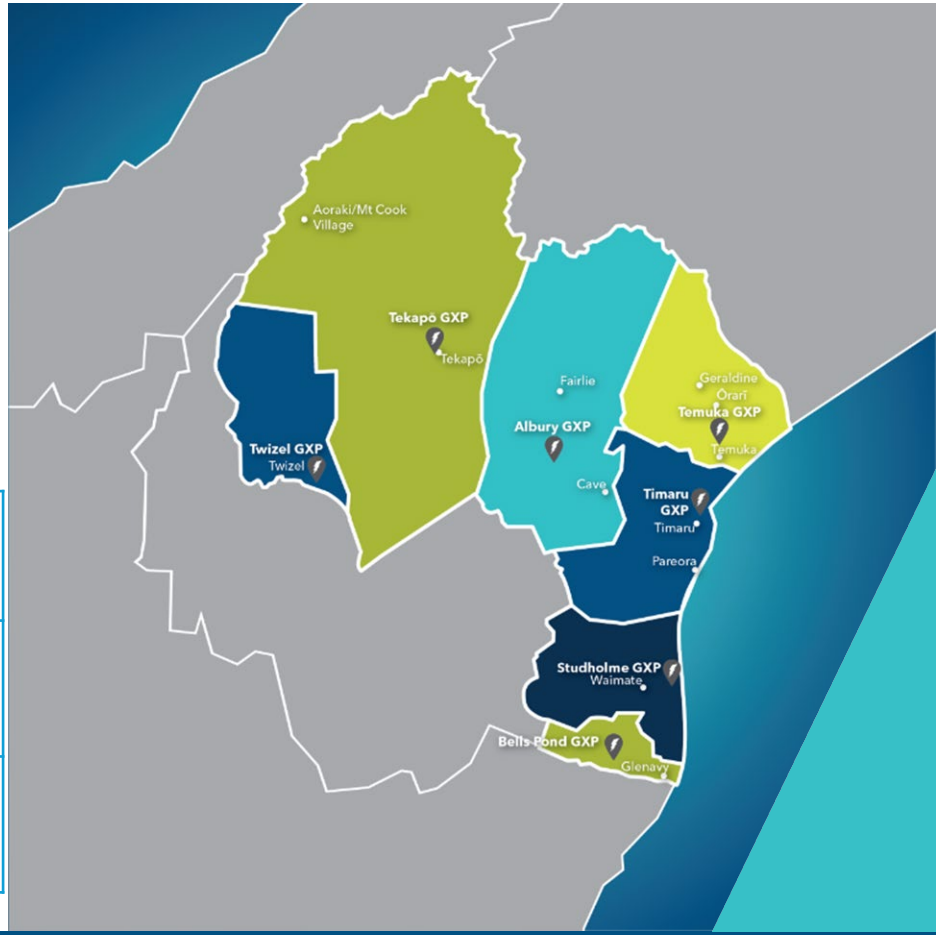
Alpine Energy Network

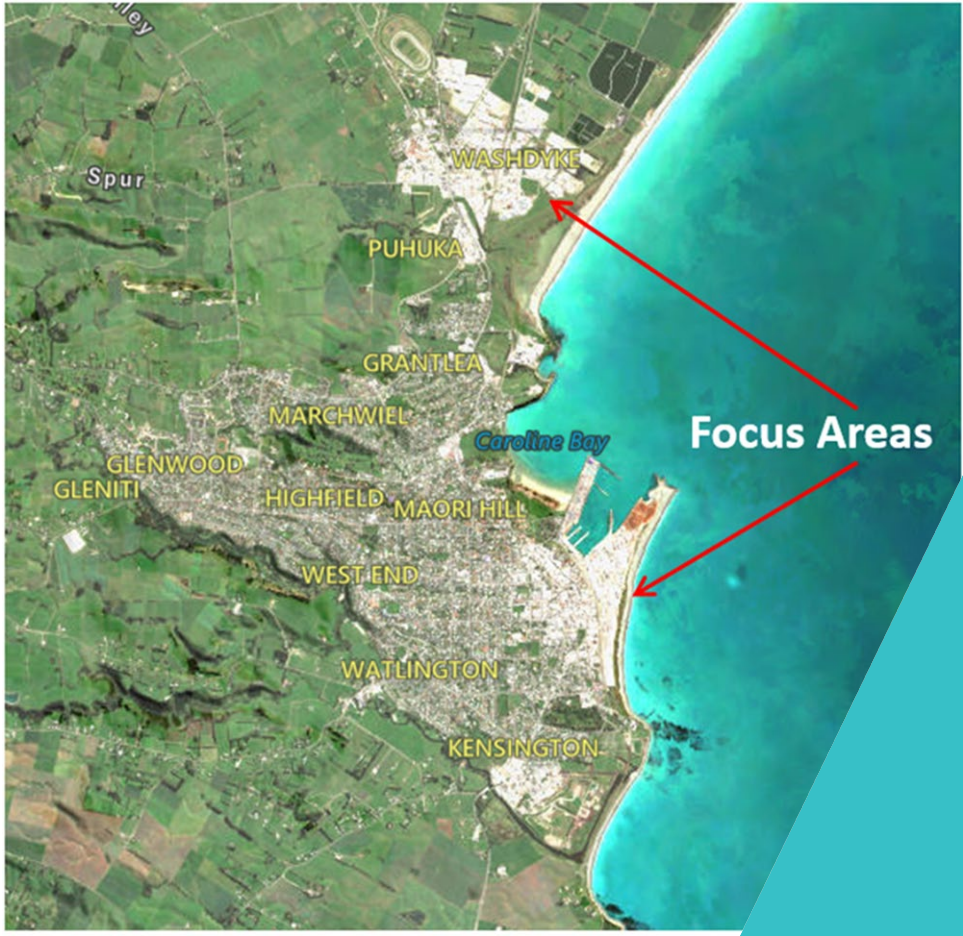
- 34,000 customers
- 150MW peak load, 860GWh pa
- 7 x GXPs
- 1 x local large scale generator

	% Annual Energy	% Customers	Larger industrial loads causing
Timaru Port Area	4%	0.3%	Causing upstream substation capacity to exceed limits
Washdyke Area	12%	1.1%	Localised Feeder capacity being exceeded

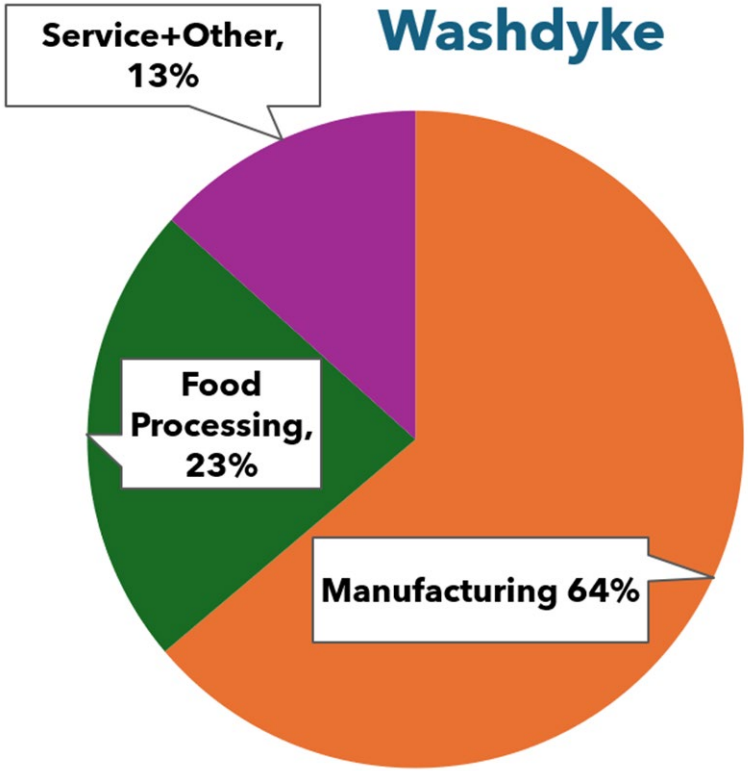


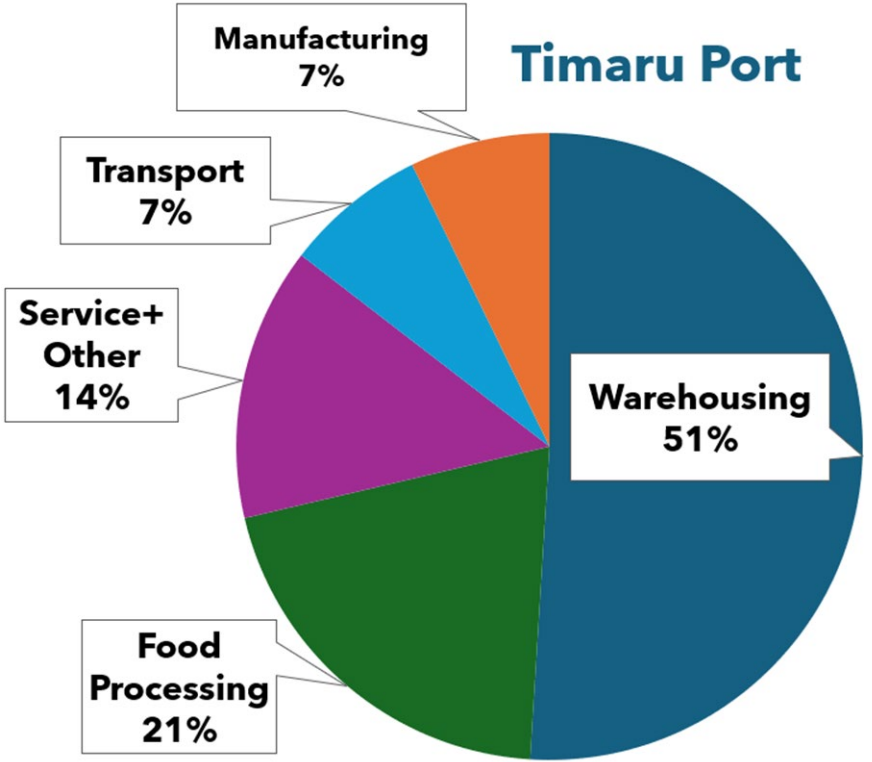
Overview

- Purpose: explore role of coordinated industrial flexibility to support network planning and operation (= cost and reliability)
- Washdyke and port with capacity constraints and/or aged assets
- A limited and targeted set of industrial customers with unknown flex capability in their business
- Whole of system thinking needed



Customer Energy Demand - Washdyke and Port





Approach

1. Discovery (into 2026)
   - Flex audits with customers
   - Match against network needs
   - Options development and assessment

2. Implementation (2026-2029)
   - Solution options are an outcome step 1 – no expectations
   - Nature and scale of solutions not pre-defined

DF Scaled Pilot - Orion

Simon Rycroft

FLEXFORUM

eea Electricity Engineers' Association

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Proposed Orion-EECA Scaled Flexibility Pilot | **High-level objectives**

- Test DSF as an **alternative to network upgrades**
- Explore **open market models** for flexibility
- See how participants respond to **live network signals**
- **Understand value stacking** across markets and services
- Capture key learnings to **prepare for a distributed future**

We propose to test market arrangements that reward for the *network* value of DSF, and **observe how customers, retailers, and the network interact**.

KEY STAKEHOLDERS

Orion

Signalling and incentivising flex when needed for the network; disseminating pilot learnings

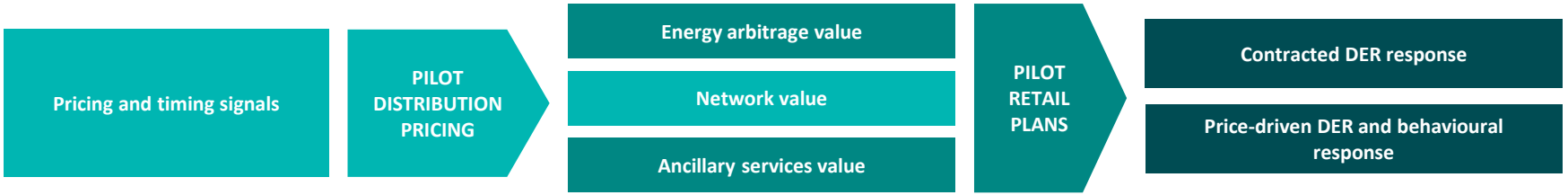
Retailers

Engaging consumers with products that incentivise DER and behavioural demand response across the value stack

Community

Co-investing in DER; participating in demand response; providing data and insight

COMMERCIAL MECHANISMS



We propose to stimulate DER uptake in the pilot area with support from EECA

ELEGIBLE DER TYPES

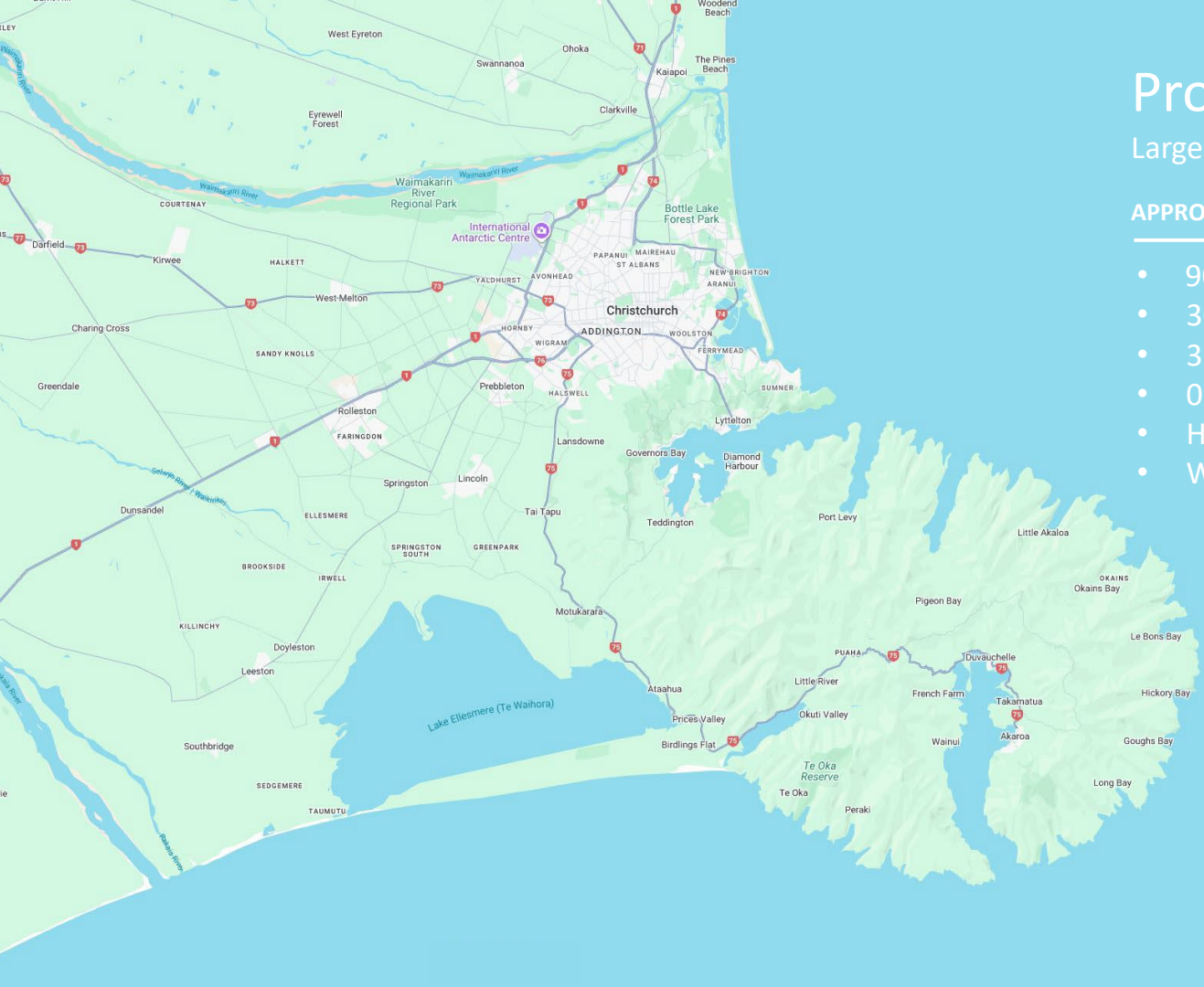
- ✓ **Home batteries** (with or without solar)
- ✓ **Community level batteries**
- ✓ **Smart EV chargers**
- ✓ **HEMS retrofits / smart heat pump control**
- ✓ **Hot water cylinder smart control devices***

Target: **Up to 1.66MW of aggregated flexible capacity**

*limited to previously uncontrolled (by Orion) or new HWC / gas conversion

EXAMPLE DER FUNDING PRINCIPLES

- Ownership sits with customer
- Communicating HHR smart meter
- Meets technical criteria (potential to align across pilots)
- Supports open protocols



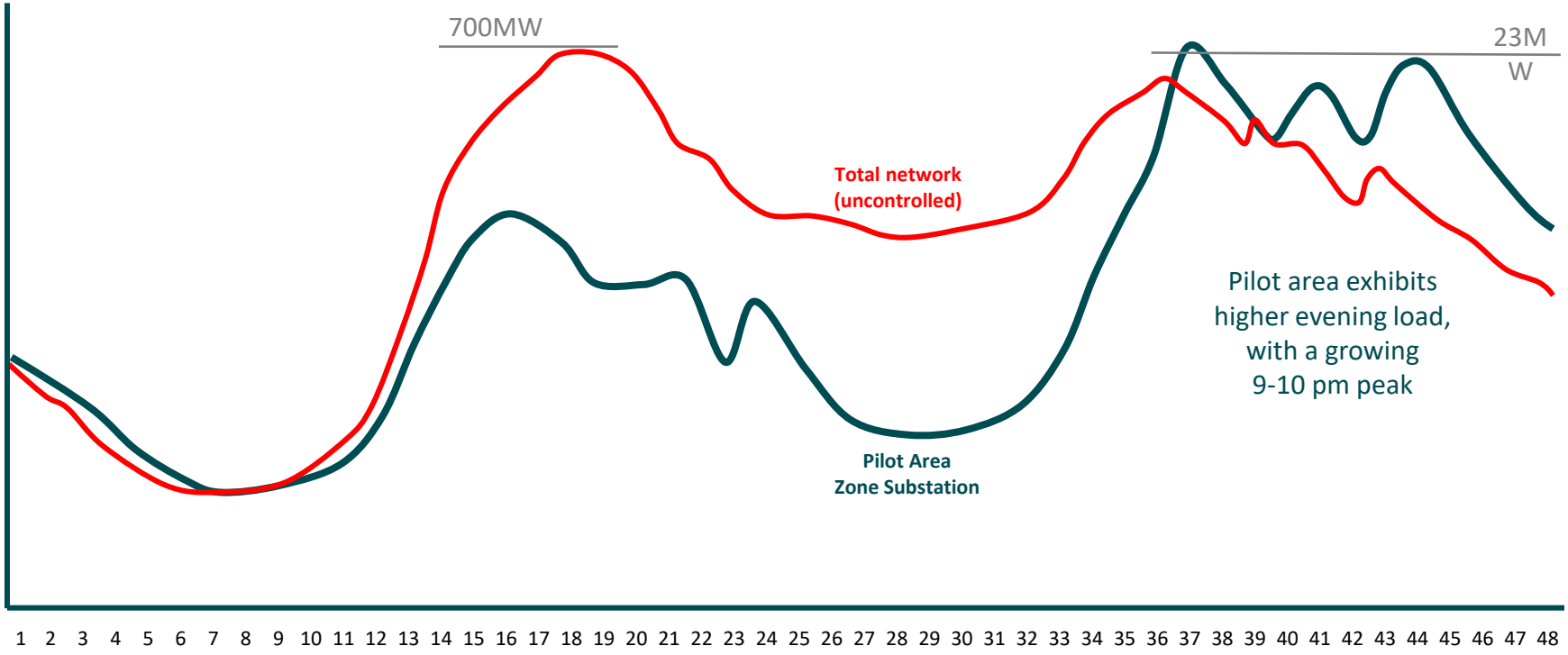
Proposed pilot area

Large Christchurch suburb

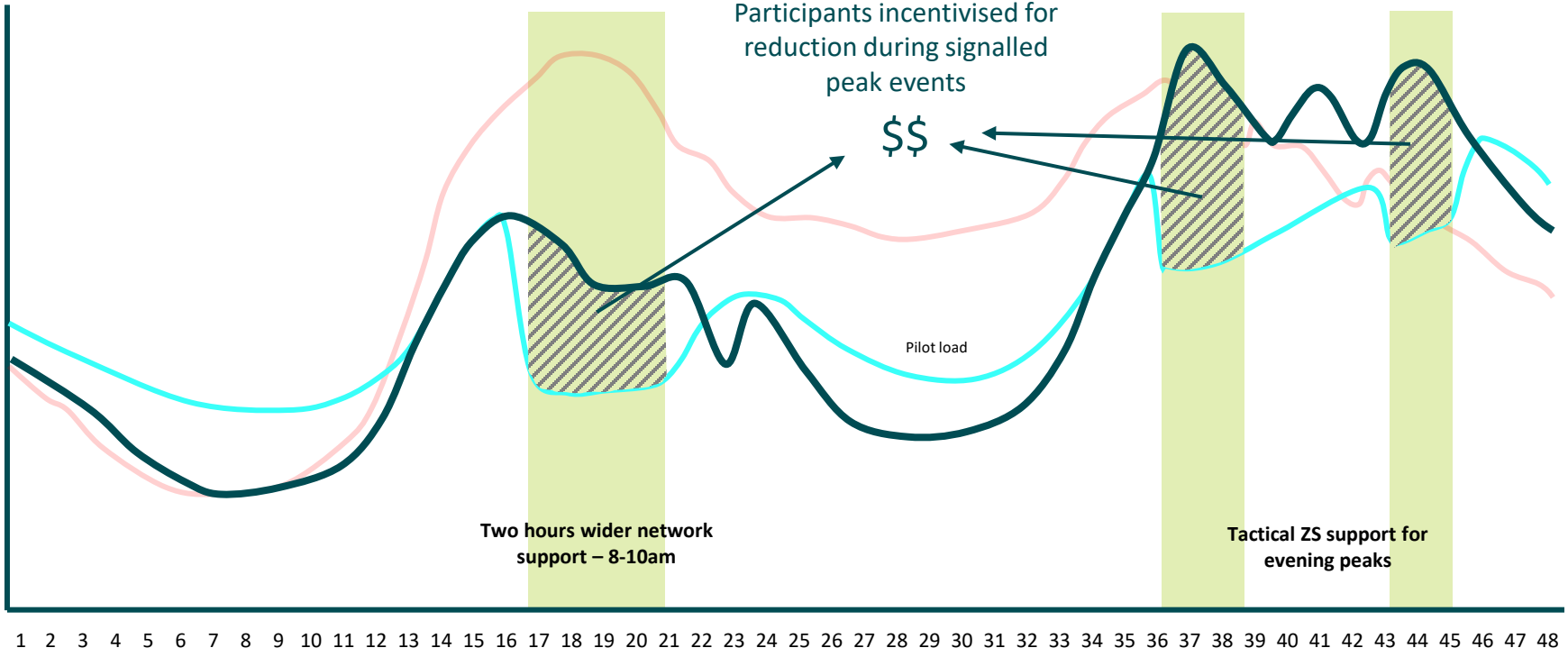
APPROXIMATE NUMBERS

- 9000 ICPs
- 300 non-residential ICPs
- 3.2 % with solar
- 0.4% with battery
- High proportion of newer homes
- Wide socio-economic range

Typical high load day, winter 2025



When Orion might call for flex (example only)



Phase 1: Discover and Define

How do we set up an environment where residential DER adoption is **Desirable, Viable and Feasible**?

Orion

Discover and Define | **Community engagement**

EECA – Orion Scaled Flexibility Pilot Community Engagement Report Outline

A diverse group of 30 residents within the proposed pilot area took part in a community charrette, with insights gained to guide pilot design and deepen Orion and partners' understanding of the pilot community.

Community engagement | Example insights

MOTIVATIONS FOR INCLUSION

Personal savings

*"It's about **saving money for me and my family**. That's it"*

Collective benefit

*"If I store more power than I can use, I would like to **gift it to local households that I know are struggling**. Is that possible?"*

Future focused and curious

*"I've got an [app] and 'look, **I can see what it's generating, I can see what my house is pulling**'…that's the sort of thing I want to do."*

PERCEIVED BARRIERS TO INCLUSION

Financial barriers

*"This is still **a lot of money for families to invest**, particularly when you've got groceries and everything else all going up too."*

*"This isn't our forever home. So, **is this going to increase my (home's) value?** Probably not, but I've still paid out."*

Complexity

*"This is hard. **This is a complex topic**, and it's hard to wrap our heads around"*

*"**I don't want people coming into my home**, without very clear communication about why this is necessary."*

Trust issues

*"We don't think retailers have our best interests at heart. **They are interested in profit.**"*

*"I feel it is important to know what is happening **even if somebody else controls it**."*

Batteries unsustainable, risky

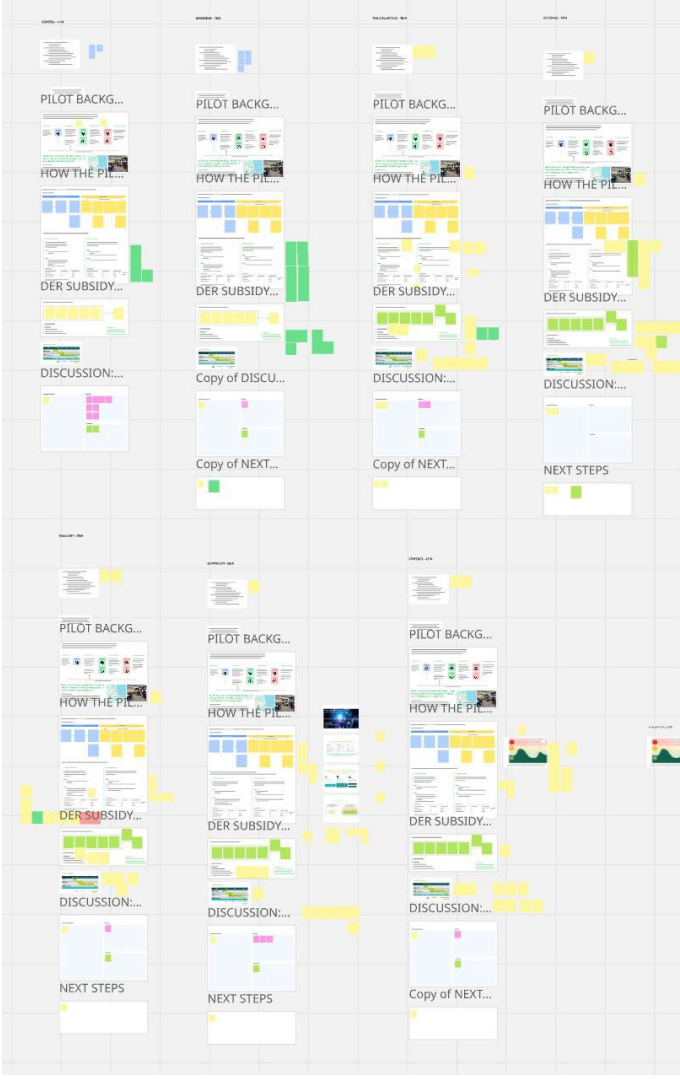
*"Where do the batteries come from and what is going to happen to them at the end of life? **I'd need to know before I would sign up**."*

*"**How long do they last? How safe are they?** Do they release any chemicals or radiation?"*

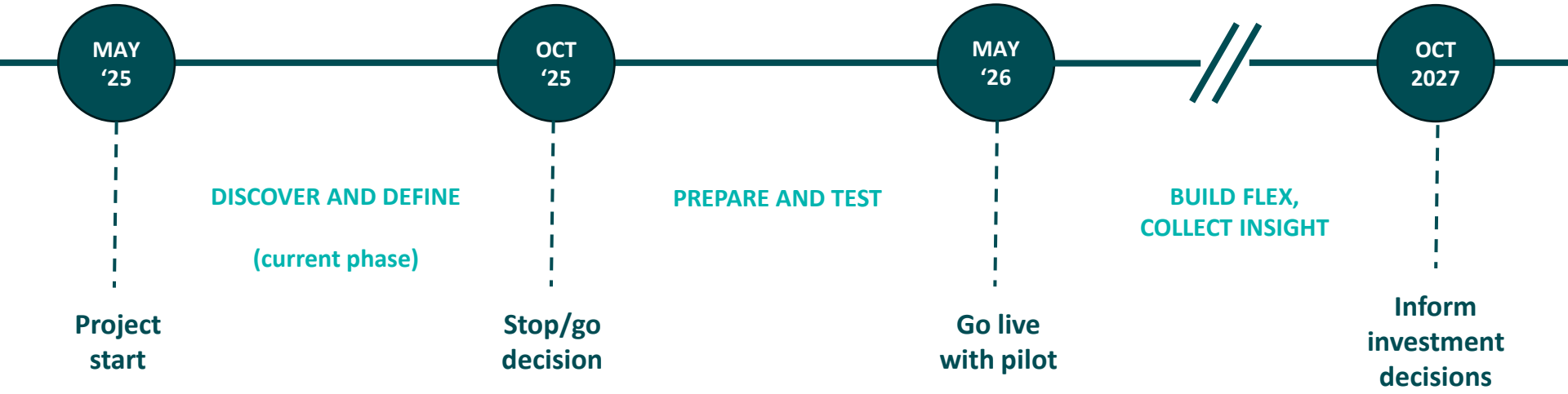
Discover and Define | **Retailer engagement**

HIGH-LEVEL THEMES

- **Resource constrained, with billing systems in flux**
- **Strategic value and learnings key for retailers**
- **Onboarding and DER installation**
- **DER transferability important**
- **Alignment across flexibility pilots a must**



Project critical pathway



WBOP – Transpower and Powerco

Michael Richardson

Ryno Verster

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TRANSPOWER

Flex Day 2025
Western Bay of Plenty MCP

Non-Transmission Solution (NTS)

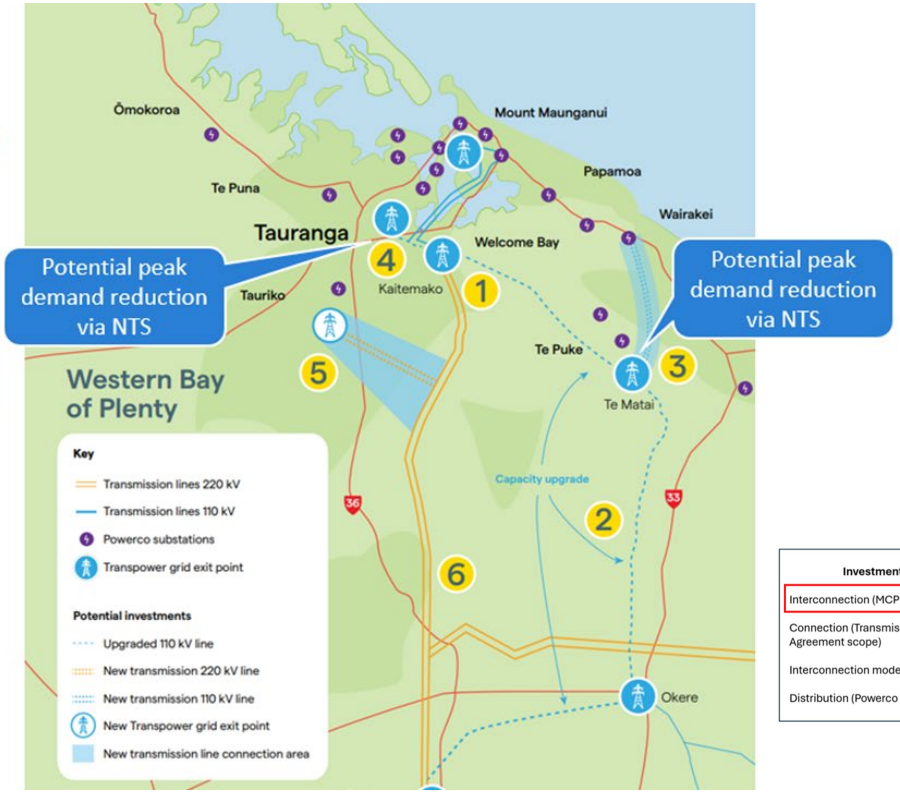
Michael Richardson

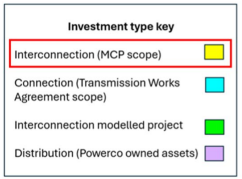
September 2025

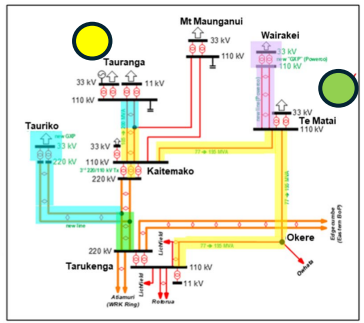
Finding Our True North - WBoP NTS

Western Bay of Plenty Regional Development Plan

Project (see numbers in yellow circles on map)		Organisation
1	Install an additional high voltage transformer at Kaitemako	Transpower
2	Replace the conductor (wires) on the 110 kV lines in the region with a larger conductor	Transpower
3	Upgrade the 110kV network out of the Te Matai substation and into Tauranga	Powerco
4	Upgrade the distribution network out of the Tauranga substation	Powerco/ Transpower
5	Construct a new Grid Exit Point (GXP) and a connecting 220kv transmission line[5]	Transpower
6	Upgrade the 220kV line from Tarukenga to where it branches off to the new substation	Transpower



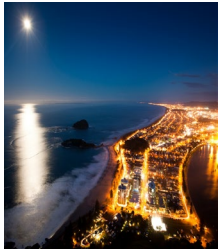




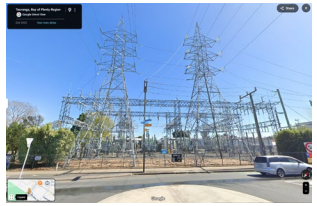
Transpower Transmission Investments Aiming to Defer

MCP Scope

Planned commissioning year	Investment	Expected cost (real 2024 $m)	Type of investment: Connection (C) Interconnection (I)
2026	Upgrade 110/33 kV transformer capacity at Te Matai	5.0	C
2030	Upgrade 220/110 kV transformer capacity at Kaitemako	13.8	I
2031	Upgrade 110 kV line from Kaitemako to Tauranga	11.0[19]	I & C
2031	Upgrade 110 kV line from Okere to Te Matai	17.8	I
2031	Upgrade 110 kV line from Okere to Tarukenga	15.8	I
2032	Upgrade 110 kV line from Kaitemako to Te Matai	13.0	I
2032	Substation upgrades after reconductoring (Kaitemako, Okere, Te Matai, Tarukenga)	0.9	I
2035	New GXP in the Tauriko area	26.4	C
2035	New 220 kV line connecting the new Tauriko GXP to the existing Kaitemako–Tarukenga line	24.0	C
2035	Enabling works at the Te Matai substation for Powerco's proposed new 110 kV line to Wairakei	9.6	C
2044	Upgrade 220 kV line between Tarukenga and Tauriko tee point	28.5	I (modelled project)
	Investigation cost	1.5	I
	Total	**167.2**	
	Interconnection[20]	**67.0**	
	Modelled project[21]	**28.5**	
	Connection	**71.8**	



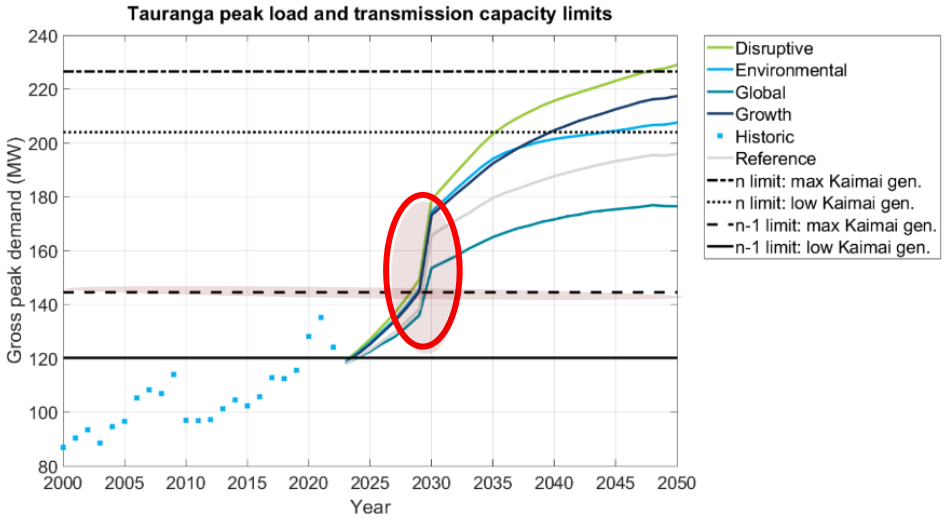
Tauranga GXP



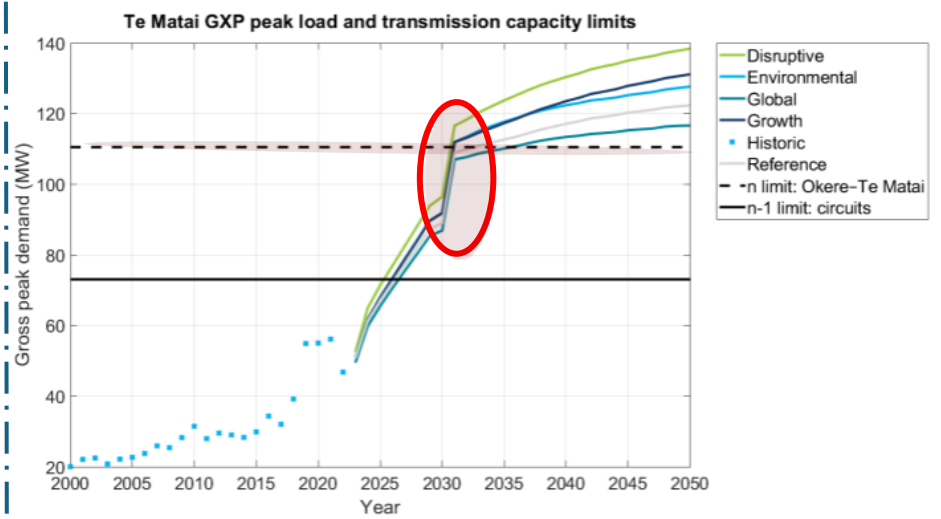
Te Matai GXP

Current Regional Peak Load Forecast & Capacity Limits

Tauranga GXP



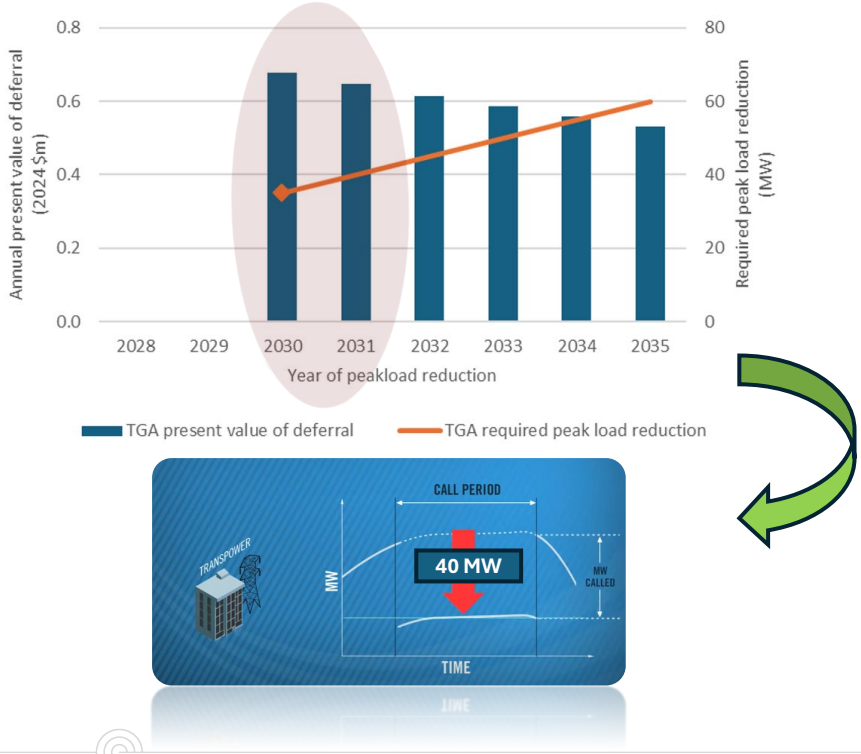
Te Matai GXP



Demand Response Required for Tauranga & Te Matai GXPs

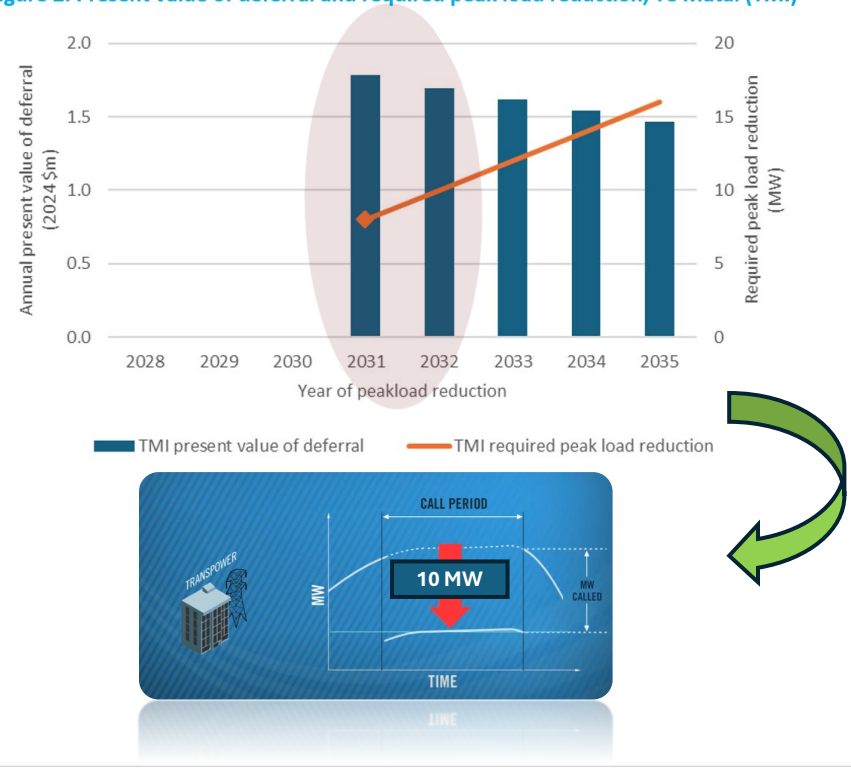
Tauranga GXP

Figure 1: Present value of deferral and required peak load reduction, Tauranga (TGA)



Te Matai GXP

Figure 2: Present value of deferral and required peak load reduction, Te Matai (TMI)



Peak Demand Heatmaps for Tauranga & Te Matai GXPs

Tauranga GXP

Maximum demand per month and hour of the day (TGA 2030, Growth scenario, in MW)

hour\month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	79	80	80	87	100	109	108	109	100	89	79	77
1	72	72	73	83	93	100	101	100	94	81	72	70
2	69	70	70	75	86	92	92	91	86	78	70	67
3	69	69	69	72	82	89	88	87	83	76	69	66
4	72	71	72	72	82	87	87	87	83	79	71	69
5	80	79	82	75	84	91	90	91	87	90	82	77
6	97	96	106	97	95	108	107	109	110	117	108	98
7	111	111	124	116	129	142	**145**	**149**	135	138	125	113
8	115	113	127	123	**150**	**166**	**172**	**172**	**155**	142	126	116
9	116	114	128	126	**150**	**166**	**170**	**168**	**155**	139	122	115
10	115	112	127	124	**148**	**163**	**166**	**167**	**148**	135	119	113
11	114	112	124	119	141	**153**	**158**	**161**	140	127	118	111
12	113	113	123	117	139	**149**	**151**	**148**	141	127	116	110
13	115	116	124	116	143	**150**	**149**	**146**	139	127	117	111
14	115	114	121	117	144	**149**	**148**	**147**	139	123	115	109
15	116	115	119	115	135	**149**	144	**145**	**145**	125	117	109
16	116	118	119	116	139	**160**	**148**	**151**	143	127	120	111
17	115	117	120	122	**151**	**170**	**163**	**162**	**152**	135	124	112
18	114	116	119	131	**165**	**173**	**170**	**171**	**160**	138	122	111
19	109	112	118	133	**162**	**171**	**168**	**169**	**164**	137	118	107
20	106	108	114	125	**155**	**163**	**165**	**168**	**160**	129	114	104
21	104	105	105	116	**147**	**153**	**154**	**160**	**150**	118	108	100
22	94	94	93	106	131	140	136	141	135	105	94	91
23	86	85	86	95	118	124	121	120	116	95	85	83

Te Matai GXP

Maximum demand per month and hour of the day (TMI 2031, Growth scenario, in MW)

hour\month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	50	50	58	68	78	82	77	74	72	64	53	46
1	47	47	55	66	75	80	73	71	70	62	51	44
2	46	46	54	64	73	77	71	69	68	61	50	42
3	46	46	54	63	73	77	71	68	67	61	51	42
4	50	50	58	63	73	77	71	69	66	66	56	46
5	59	60	69	68	77	80	77	74	74	79	69	56
6	69	65	83	78	85	91	90	90	88	91	82	67
7	72	68	88	89	100	105	106	107	100	97	86	71
8	72	68	88	92	104	**111**	**111**	**112**	104	97	85	71
9	71	67	87	92	104	**112**	**110**	**110**	103	95	84	69
10	70	65	86	91	103	**111**	108	106	101	94	83	68
11	70	65	86	91	102	107	106	103	98	93	83	66
12	70	65	87	90	101	107	104	103	97	92	82	66
13	70	65	87	91	101	107	104	101	96	91	81	66
14	71	65	86	90	101	106	103	100	96	91	81	66
15	71	65	86	91	101	107	102	100	97	93	82	67
16	71	67	85	90	101	110	105	105	98	92	81	68
17	68	66	81	91	105	**112**	108	107	99	89	78	65
18	68	67	79	91	105	**111**	108	107	98	88	76	64
19	65	65	79	91	104	**110**	108	106	98	86	74	62
20	65	65	77	86	99	106	102	102	95	83	73	61
21	63	61	71	83	95	108	97	96	89	77	67	59
22	58	57	66	77	88	96	89	88	82	72	62	54
23	54	53	62	72	81	87	82	80	76	67	57	49

- Peak demand reduction would be required predominantly during winter months (Jun-Aug)
- Morning (8-10am) and evening peaks (5-8pm)
- Likely some shoulder periods

WBoP Play Book for Flexibility Programme(s)

Tauranga

Tauranga (TGA) - 2030	
Transmission Capacity Limit **(Control Below this Threshold)**	140MW
Required Peak Load Reduction	40MW *
Likelihood of Flexibility Events Occurring	May through Sept. **(peak periods 8-10am / 5 – 8pm)**
Flexibility Programme Length	1yr. **(Capturing shoulder periods)**

Te Matai

Te Matai GXP (TMI) – 2031	
Transmission Capacity Limit **(Control Below this Threshold)**	110MW
Required Peak Load Reduction	10MW *
Likelihood of Flexibility Events Occurring	May through Sept. **(peak periods 8 -10am / 5 – 8pm)**
Flexibility Programme Length	1yr. **(Capturing shoulder periods)**

* - The flexibility NTS programme(s) will aim to procure over this minimum required load reduction amount

Scenarios We Are Expecting - Option #1
(Single Flex Service Provider (Powerco) with Local Flex Market)

Flexibility Services Purchaser

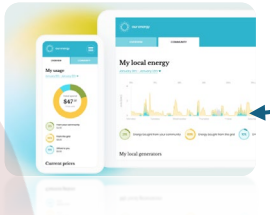
TRANSPOWER

Flexibility Service Provider (FSP)

POWERCO

Flexibility Market Technology Provider

our energy



Local Flexibility Market

POWERCO

TRANSPOWER

TGA

TMI

EDB/DSO

Zone Substation

Zone Substation

Zone Substation

Zone Substation

Distribution Substation

DER / CER

Scenarios We Are Expecting Cont. – Option #2 (Multi-Flex Service Providers with Local Flex Market)

Flexibility Services Purchaser

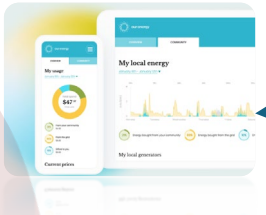
TRANSPOWER

Flexibility Service Provider (FSP)

POWERco

Flexibility Market Technology Provider

our energy



Local Flexibility Market

POWERco

TRANSPOWER

TGA

TMI

Zone Substation

Zone Substation

Zone Substation

Zone Substation

EDB/DSO

Large Commercial / Industrial

Distribution Substation

DER / CER

(FSP)

Simply Energy

Scenarios We Are Expecting Cont. – Option #3 (Multi-Flex Service Providers with Local Flex Market & Retailers)

Flexibility Services Purchaser

TRANSPOWER

Flexibility Service Provider (FSP)

POWERco

Flexibility Market Technology Provider

our energy

Local Flexibility Market

POWERco

TRANSPOWER

TGA

TMI

EDB/DSO

Zone Substation

Zone Substation

Zone Substation

Zone Substation

Large Commercial / Industrial

Distribution Substation

DER / CER

Simply Energy

(FSP)

(FSP)

octopus energy

Meter Equipment Providers – Source of Truth

BLUE CURRENT (MEP)

Meter Equipment Provider (FSP)
M&V

Flexibility Services Purchaser

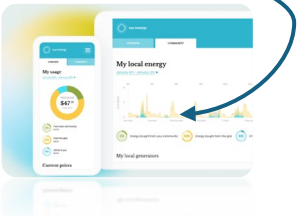
TRANSPOWER

Flexibility Service Provider (FSP)

POWERco

Flexibility Market Technology Provider

our energy



Local Flexibility Market

POWERco

TRANSPOWER

TGA

TMI

EDB/DSO

Zone Substation

Zone Substation

Zone Substation

Zone Substation

Large Commercial / Industrial

Distribution Substation

DER / CER

(FSP)

Simply Energy

(FSP)

octopus energy

Questions to Table to Flex Forum Members

- Dual, programme participation could be likely (non-price responsive / secure and price responsive / choice based)
  - What type of penalties should be applied for participants who underperform (Non-price responsive / secure programme type)? VoLL seems high. Could be a % proportion that has been paid out, paid back?
- Should there be a max/min flex threshold requirement for potential FSPs? If so, what level of flex should that be set at?
- Traditional RFI/RFP vs online application (portal) approach?
- Bonus for performance & participation?

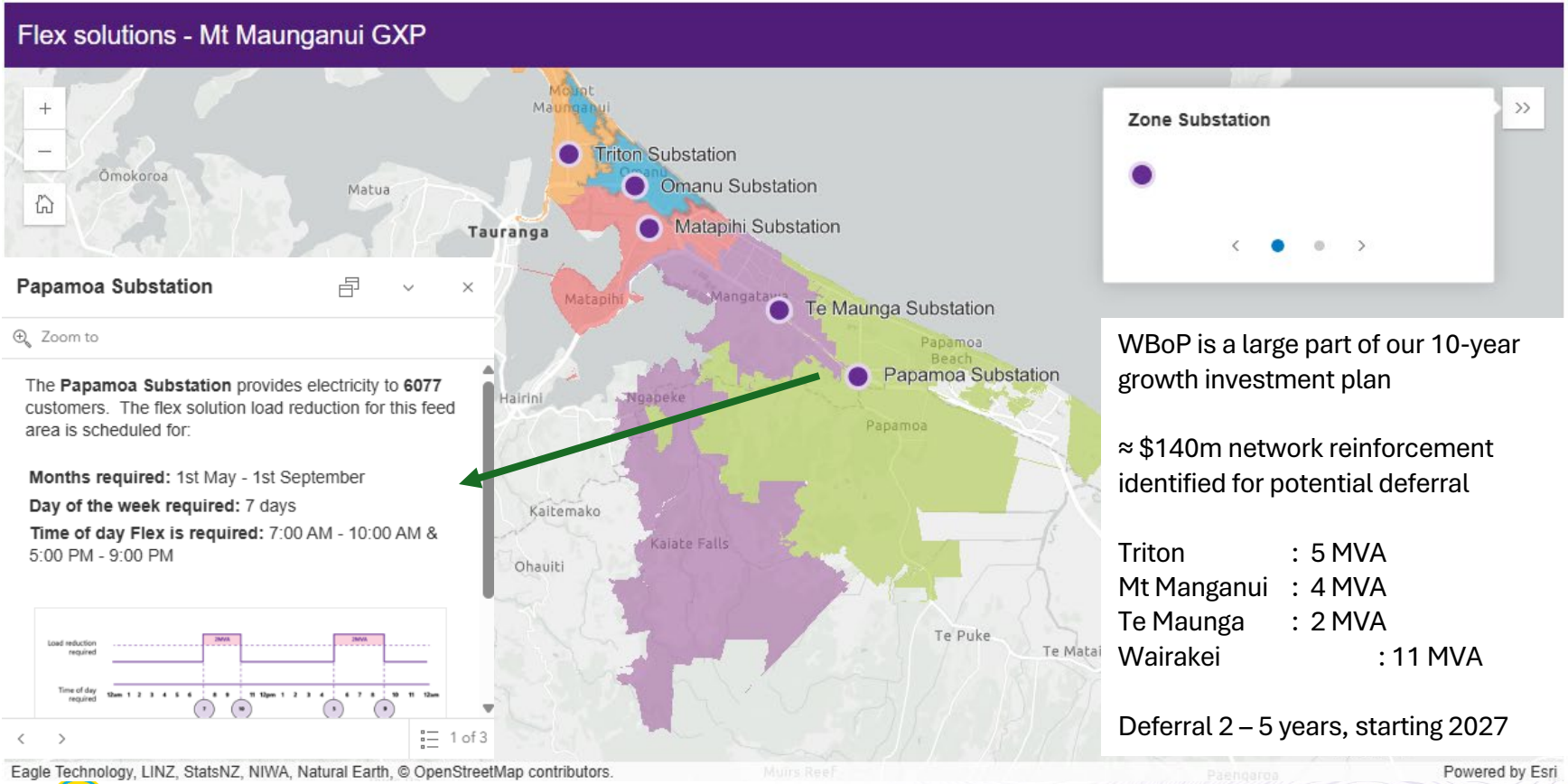
Flex Day 2025

Western Bay of Plenty Capacity Upgrades

Non-traditional solutions

9 September 2025

Distribution network perspective on WBoP capacity requirements



WBoP is a large part of our 10-year growth investment plan

≈ $140m network reinforcement identified for potential deferral

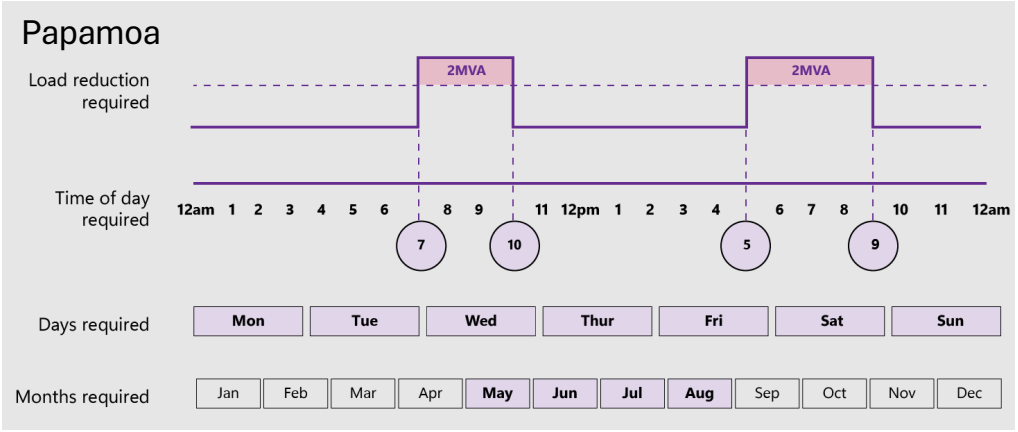
Triton : 5 MVA
Mt Manganui : 4 MVA
Te Maunga : 2 MVA
Wairakei : 11 MVA

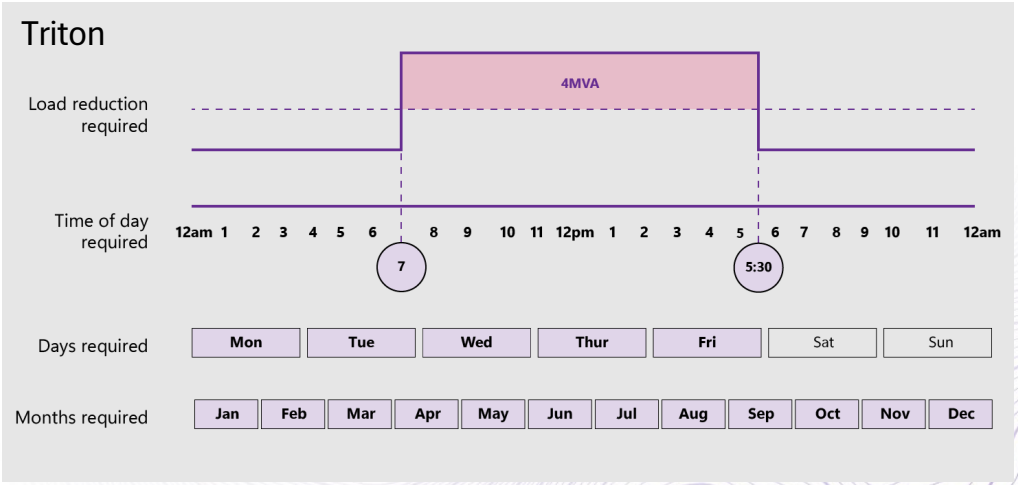
Deferral 2 – 5 years, starting 2027

POWERCO

Seeking flexibility solutions : Process to date

- Deferral candidate projects identified from AMP
- Expressions of interest issued
  - Website, press and through direct contact
  - Open to all offers >500 kVA
- Responses reviewed and shortlisted
  - Very positive - wide interest, mature offers!
  - Potentially oversubscribed
- Determining the best matches for our needs, the value of deferment and the offers received
- Now embarking on the contractual phase
  - Leave flex providers 2 – 3 years to develop their offers
- Internal changes to follow (control room, planning, etc.)





POWERCO

We're learning fast about flex – so many issues to work through!

- How do you value flexibility? (It's much more complicated than we thought!)
  - Location-specific
  - Time-specific
  - Peak or energy reduction?
- What are the flex provider expectations
  - How much time to develop offering?
  - How to cover upfront costs (well ahead of flex actually provided)?
  - Always on call, or scheduled availability?
  - Penalties for non-compliance?
- Building up a flex portfolio from multiple offers
  - Do we create a priority stack? (Based on price or availability?)
- Day-ahead flex scheduling, hours-ahead or immediate? (Combination?)

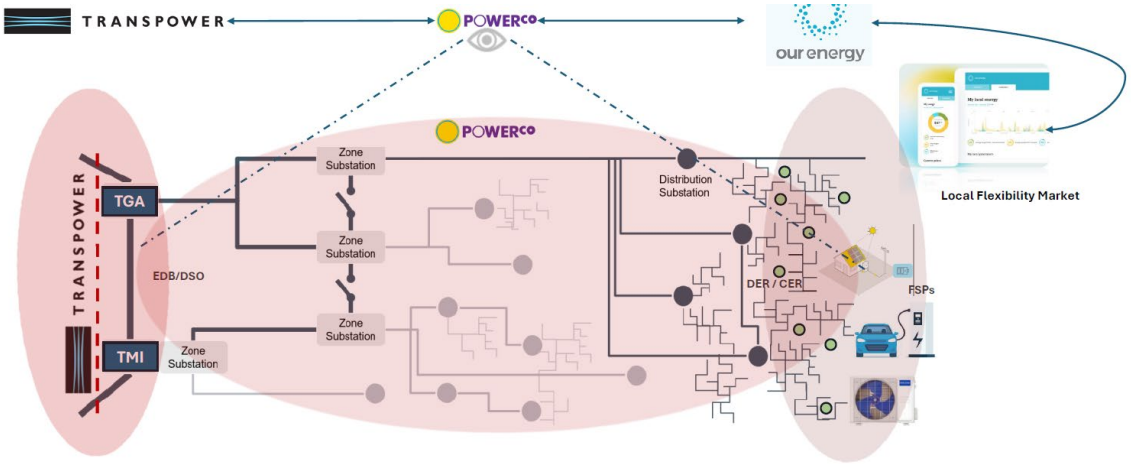
But the prize is significant!

- NPV of these deferrals ≈ $15m (distribution component), plus
  - Value from possible further deferment
  - Flex provider value
  - Transmission component
- Much improved understanding of what network constraints and value actually mean
  - Identified some projects for deferral just through deep reflection – no flex required
- Principles to be applied throughout the network
- Can delay investment until we have more certainty on demand growth or future types of energy use

By jumping in and doing this work, we've progressed in a few months way beyond what a detailed, theoretical planning approach would have achieved in a year!

Transmission and distribution collaboration on non-traditional solutions – still early on, but it's working

What would this actually mean?



Powerco and Transpower's need for flex mostly corresponds well.

- Can we "stack" the benefits for consumers?
- Should Transpower share in the cost of flex Powerco is already procuring?
- What should our contractual relationship look like? Penalties for non-compliance?
- When do system needs take precedence over distribution needs?

And what about those periods where our needs do not fully coincide?

- If Transpower needs flex, outside Powerco's need, how should we contract for this?
- Communications protocols
- Differentiating advance or immediate needs

POWERCO

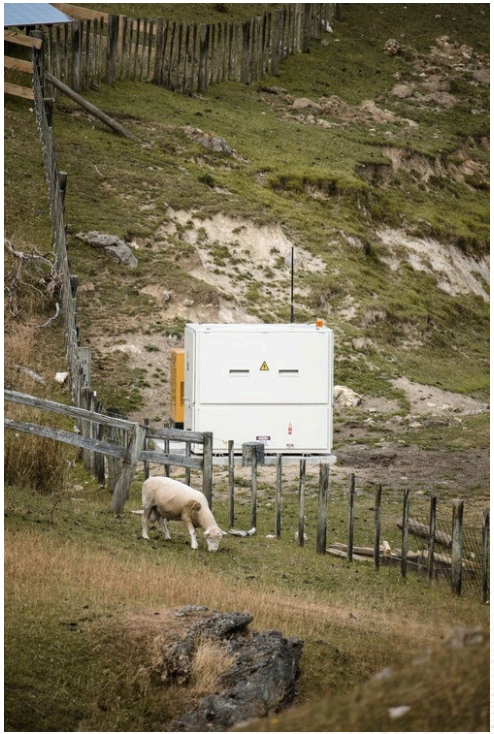
And some other non-traditional solutions in the region…


Greerton trial


Whangamata

We're trialling other non-traditional solutions, including batteries – small and large

However, we do not necessarily want to own these, other than for pure network applications or as a flex supplier of last resort. (If no third party is interested.)


Off-gridding solutions (although not in Tauranga itself!)

Questions

POWERCO

DF Scaled Pilot – Vector

Matt Smith

FLEXFORUM

eea Electricity Engineers' Association

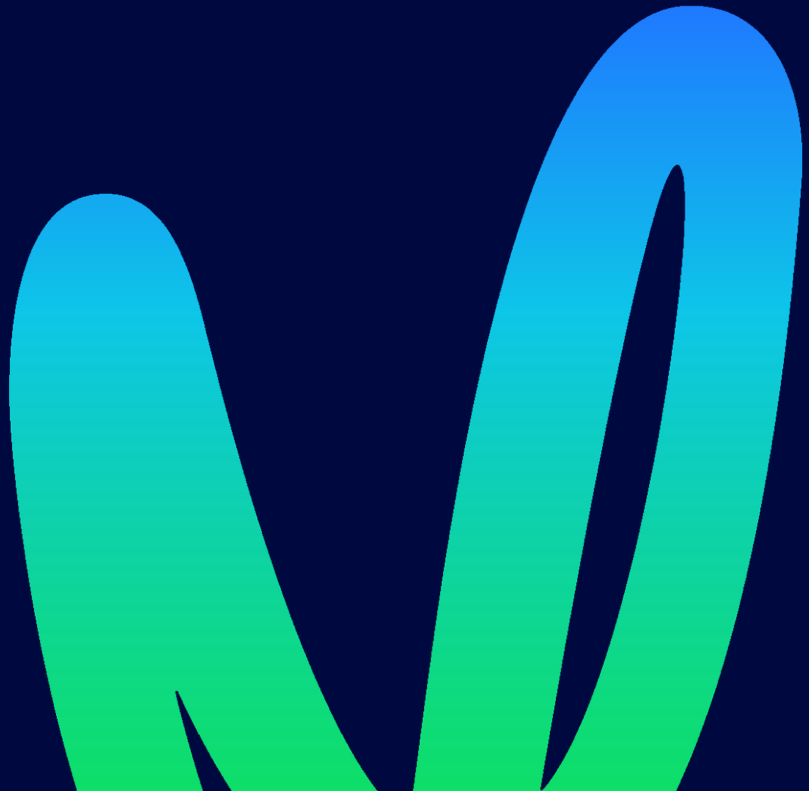
EECA TE TARI TIAKI PŪNGAO ENERGY EFFICIENCY & CONSERVATION AUTHORITY

Scaled Demand Flexibility Trial at Vector

Matt Smith

EEA FlexDay Presentation

9 September 2025



vector

What might 2035 look like?

As we rely on a higher share of intermittent sources of energy, supply will likely increase the value of flexible demand

In the energy transition a “typical” residential property will be more electric, displacing other types of energy used:

People will be looking for cost savings, comfort and convenience (and maybe resilience)

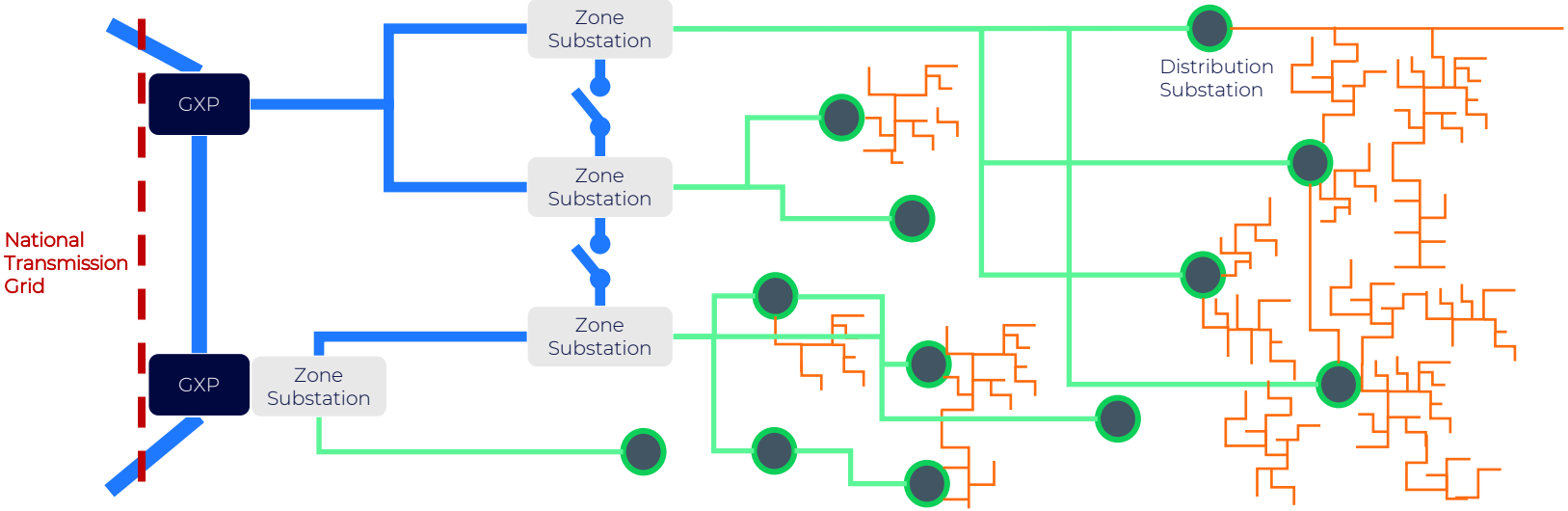
Some areas will change faster than others, by 2035 we may see areas of our network where every house has at least 1 EV

What does this mean for Vector's Distribution Network

Sub-Transmission
- 15 GXPs connecting Auckland's network to the national grid
- ~200 circuits
- ~1,000km lines/cables

High Voltage Distribution
- 114 Zone Substations
- ~1,000 feeders
- ~7,500km lines/cables

Low Voltage Distribution
- ~22,000 Distribution Substations
- ~35,000 feeders
- ~11,200km lines/cables



Multiple pathways for power to flow across the grid
High Load Diversity

Single pathway for power to flow across the grid
Low Load Diversity

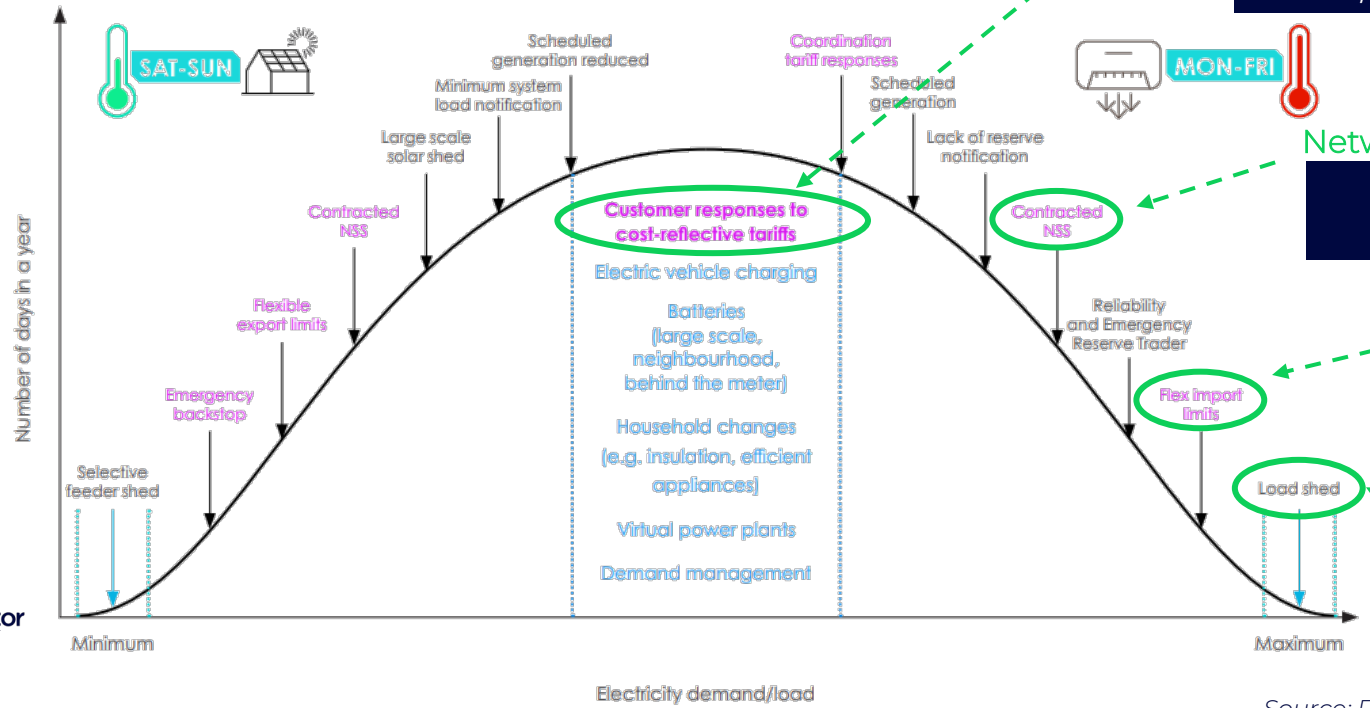
Adapted from NERA Report – *"Promoting Efficient and Affordable Infrastructure to enable electrified transport"*, 2023


“Diversity destruction” is a real risk
Synchronisation (“herding”)
Diversity

There is a range of orchestration mechanisms to test

(before there are widespread network security issues at LV)

Figure 8 | Range of available measures for managing minimum demand from peak PV exports, and maximum demand event[59]



Network pricing

Dynamic pricing, control tariffs, flexible connections

Network support services

Warkworth ROI & Flexibility Services

Operating limits

AT Bus Depots

Emergency orchestration / Network protection

LMP

Source: Fig 8, Project Edge Final Report

Goal: A test-bed of the future with high electrification and demand flexibility to demonstrate efficient use of LV network headroom across multiple 3rd parties

Who

- Vector
- Retailers / Aggregators
- Customers
- EECA

What

- High DER penetration on LV (e.g. distribution substations)
- Network with enhanced visibility, analytics, and protection
- Real-time coordination of headroom with multiple 3rd party device managers
- Develop and test static and dynamic orchestration mechanisms such as pricing and operating limits

Where

- Neighbourhood(s) with flat load growth
- An area likely to achieve high DER penetration with EECA support
- Future HV/MV network deferral opportunity

Why

- Confidence in coordination as we reach headroom limits and during emergencies
- Developing capability to communicate network limits and for partners to operate within those limits
- Demonstrate efficient use of headroom and discover the triggers for investment in additional headroom (making the investments at the right time)

What's next?

Location, location, location

Area with future opportunity

Customer demographics matching customer proposition

Project Partners

Retailers / Aggregators

Installers / Manufacturers

Project Co-design

EECA

Other EDBs working with EECA

Project Partners

vector

Session 2

MC Toby Stevenson

11.15am What causes consumers to say yes to flex and delighting the customer – Lynne Gallagher (Australian Energy Regulator)

11.45am Round table exercise – Facilitated by Connie Dunbar (EEA), Craig Evans (FlexForum), Stuart Johnston (EEA)

12.10pm Round table share back - Facilitated by Connie Dunbar (EEA)

12.40pm Flex fund update and what's next – Briony Bennett (Ara Ake)

12.50pm Closing remarks - Stuart Johnston, EEA

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What causes customers to say yes to flex?

Lynne Gallagher – Australian Energy Regulator

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ENERGY EFFICIENCY & CONSERVATION AUTHORITY

Discussion Time

1. Get into groups of 5 (1/2 table)

2. We want each group to list...

- Your top 3 questions that need to be answered about the topic, eg, how, who, why etc. And the reason you have the question.
- Your experiences, if any.
- Your observations, eg, this is a tough one to answer, or ‘this needs to involve X and Y’.
- Your view on what success looks like.

Write stuff down so it is on the record.

3. Each table will have 2-3 minutes to share their key insights...

- the 1 question which most intrigued/exercised the group
- a perspective on what success looks like to the group, including any contrasting views.

Make sure you pick a speaker!

Theme: Involving customers and successfully asking people to say yes to flex.

What **questions** need to be answered to achieve this outcome? Some prompts... • How do people say yes to flex? • Who asks people to say yes? • Do people respond when the network needs their flex? • What information and tools do people need to make decisions about demand flexibility? • What approaches do distributors/Transpower want to use to 'recruit' flex?	What is the reason for the question(s), including why it is critical to success? Some prompts... • "People like simplicity..." Success requires flex propositions which simplify the market complexity • "People don't trust giving control to the electricity industry, eg, many people installing solar remove the ripple relay..." Success – by having more flex in the system – requires people to confidently say yes to flex • Successfully asking people to say yes to flex should result in ...more flexibility propositions in the market, ...more flexibility events (ie, flexibility is used to do something), ...increasing volumes of flexibility in an official flexibility record
Name:	

Flex Fund, Opportunities and what’s next

Briony Bennett – Ara Ake

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National Flex Discovery Fund

Ara Ake
Future Energy Development

September 2025

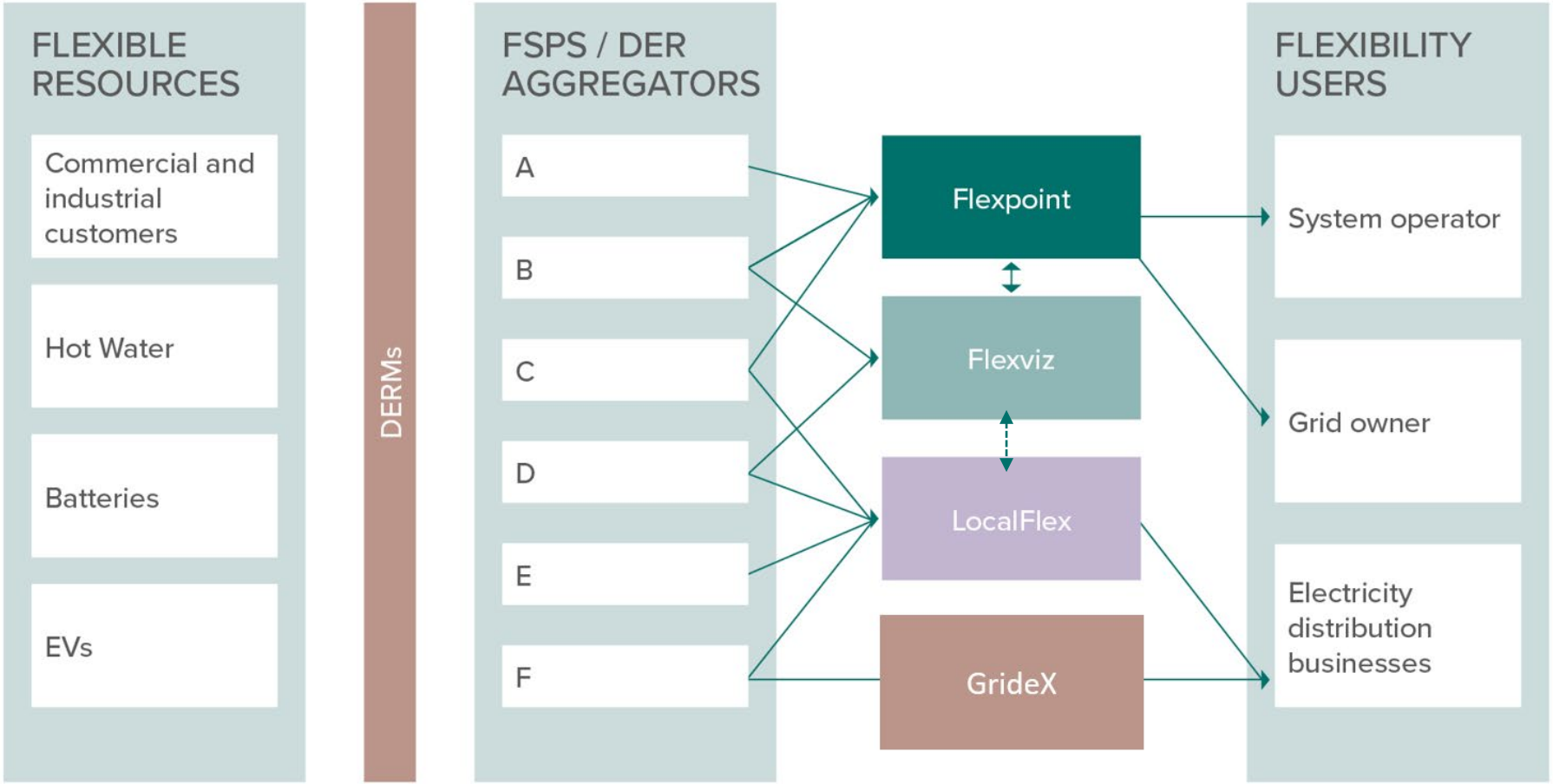
Briony Bennett

Senior Energy Innovation Manager

National Flex Discovery Fund results

- 160% oversubscribed
- 20 applicants
- 14 awarded based on $ per kilowatt and greatest number connected to platforms
- New connections to GrideX, Flexviz, Flexpoint, Localflex platforms by end of 2025
- Track 2 funds will deliver five projects across diverse technologies: hot water controls, home energy management systems, remote, smart and fast EV charging, and commercial and industrial load by winter 2026.
- Total allocation $640,000

Ara Ake
Future Energy Development


FLEXIBLE RESOURCES
Commercial and industrial customers
Hot Water
Batteries
EVs
DERMs
FSPS / DER AGGREGATORS
A
B
C
D
E
F
Flexpoint
Flexviz
LocalFlex
GrideX
FLEXIBILITY USERS
System operator
Grid owner
Electricity distribution businesses

National Flex Discovery Fund results

1) SUPA Energy
2) Octopus Energy
3) Flex-Able
4) PowerHub
5) Gridsmart, Rinnai NZ
6) Ecotricity
7) EWI Energy
8) Daikin New Zealand
9) Evnex
10) Lastmyle
11) Cortexo
12) Counties Energy
13) Simply Energy

Ara Ake
Future Energy Development

Next steps

- Ara Ake is exploring ‘digitalisation’ opportunities in flexibility and how the different platforms will evolve and work together
- A critical mass of players and volume on the platforms by next winter will help accelerate flexibility market development and uptake from potential buyers
- We remain open to collaborating on your innovative flexibility proposals

Ara Ake
Future Energy Development

Closing Remarks

Stuart Johnston – EEA

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