Everything is ‘Flex’

New Zealand's Flexibility journey using openADR®

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openADR® | 2.0b CERTIFIED

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Key statistics

	New Zealand	United Kingdom
Area	268,021 Km^2	243,610 Km^2
Population	5.2 million	69 million
Electricity consumption (2023)	39.718 GWh	92.6 TWh
Peak demand (2023)	7.3 GW	48.3 GW
Total electricity connections	2.28 million ICPs	31.1 million MPAN
Solar connections	65,222 (0.470 GW)	1,178 million (14.0 GW)
EVs registered	110,000	2,029,000
% Renewable energy	85%	51.6% (2024)

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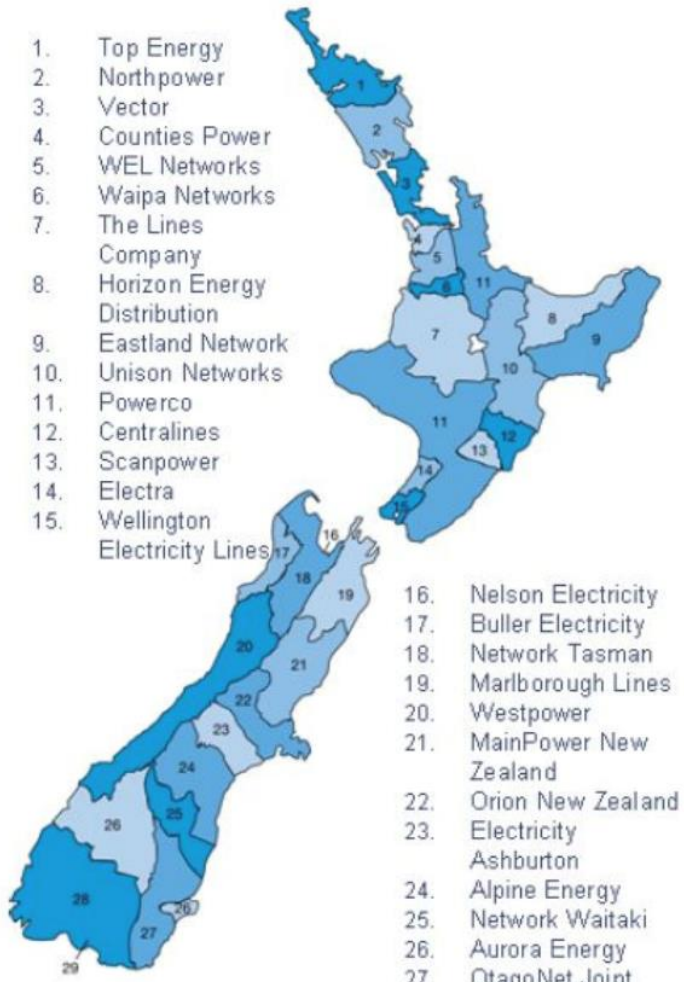
The Grid

The National Grid owner and System Operator

TRANSPOWER

There are currently 29 EDBs operating in New Zealand.



1. Top Energy
2. Northpower
3. Vector
4. Counties Power
5. WEL Networks
6. Waipa Networks
7. The Lines Company
8. Horizon Energy Distribution
9. Eastland Network
10. Unison Networks
11. Powerco
12. Centralines
13. Scanpower
14. Electra
15. Wellington Electricity Lines
16. Nelson Electricity
17. Buller Electricity
18. Network Tasman
19. Marlborough Lines
20. Westpower
21. MainPower New Zealand
22. Orion New Zealand
23. Electricity Ashburton
24. Alpine Energy
25. Network Waitaki
26. Aurora Energy
27. OtagoNet Joint Venture
28. The Power Company
29. Electricity Invercargill

Source: Electricity Networks Association

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In a nutshell - the slightly scary bit

We are electrifying the economy!

Transpower tells us New Zealand's electricity demand could increase by 68% to 92% by 2050. This translates to an additional 29-39 TWh of annual electricity generation.

The Boston Consulting Group advised that we must *spend $42 billion to provide the necessary generation and infrastructure.*

This includes ***$30.2 billion in Transmission and distribution spending.***

A smarter, more flexible electricity system will save around $10 billion on an NPV basis to 2050.

Boston Consulting Group THE FUTURE IS ELECTRIC - A Decarbonisation Roadmap forNew Zealand's Electricity Sector - October 2022

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The Flextalk Journey (so far)

EECA eea Electricity Engineers' Association

Flextalk 1.0

‘Seed’ Project

Flextalk 2.0 EMPOWER

Flexviz

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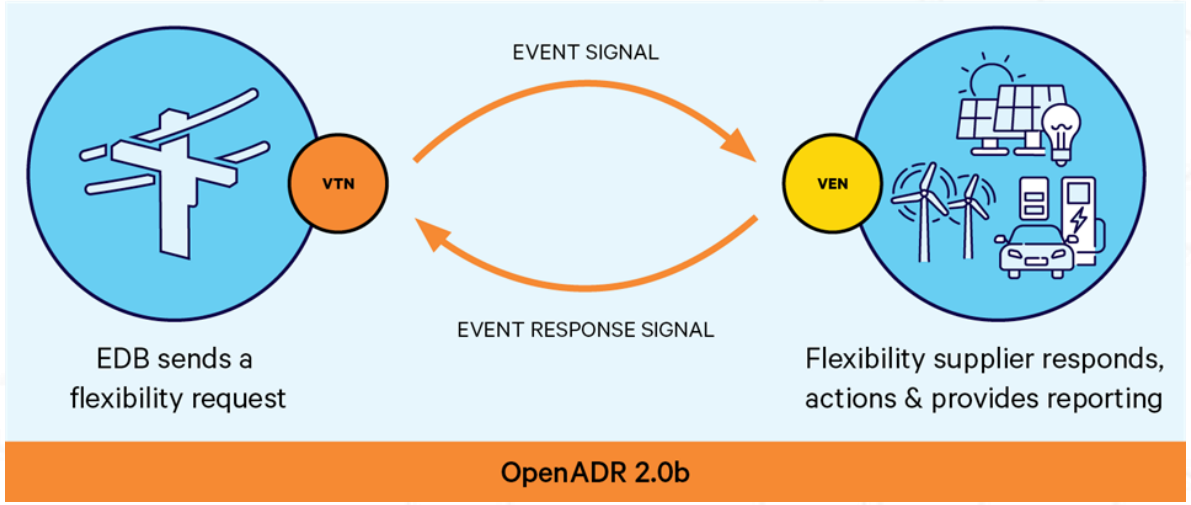
FlexTalk 1.0 Common Communications Protocol Project

- Evaluation of the processes that need to be in place to apply the OpenADR 2.0 (2.0a and or 2.0b) communication protocol to achieve active managed charging of electric vehicles (EVs)

- Enabling flexibility services to be utilised in the electricity sector in New Zealand.



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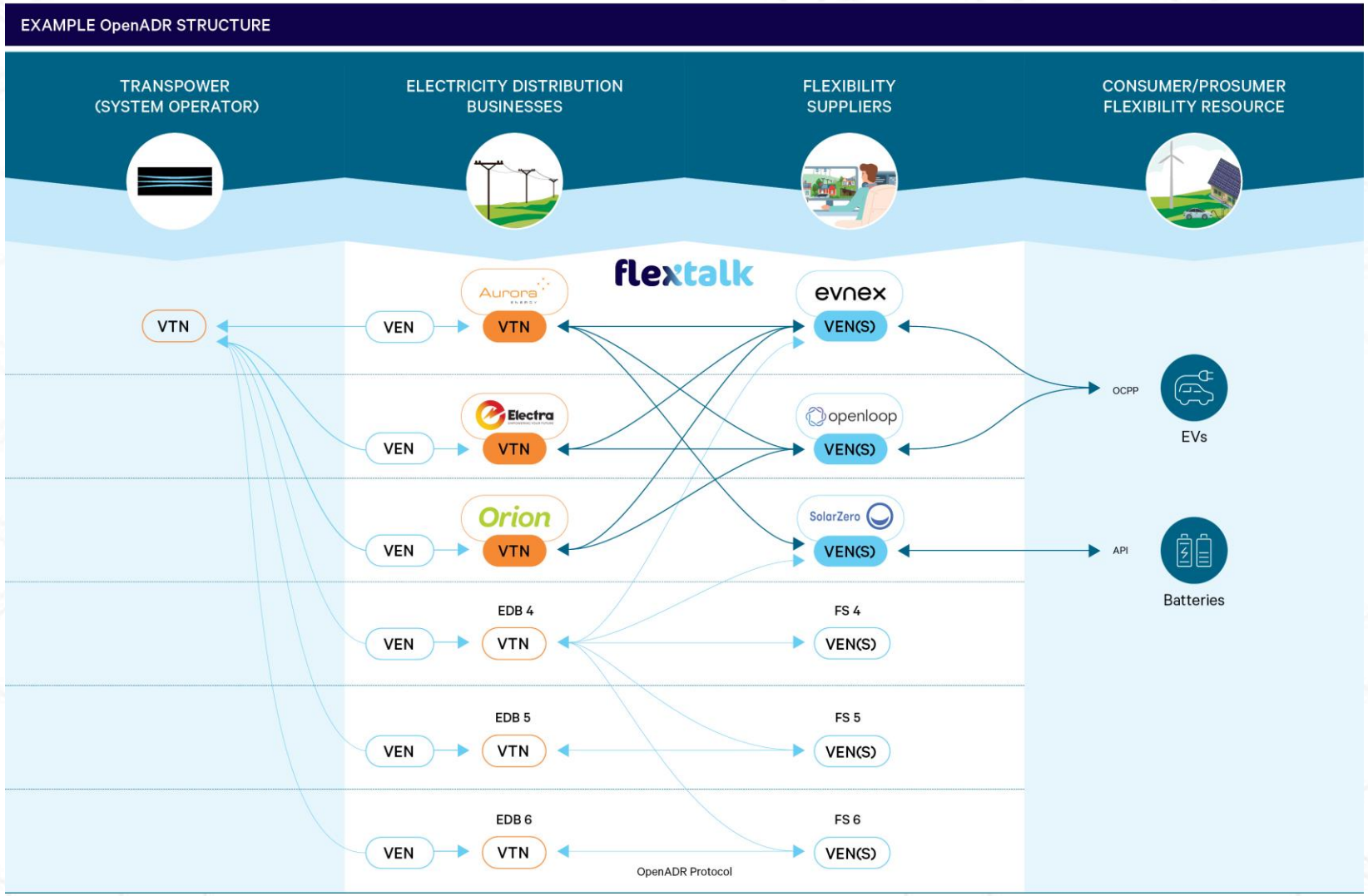
The set-up (3 EDBs & 3 Flex Suppliers)



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The programs

Program Name	Signal Name	Signal Type	Payload
In Advance	Load_Dispatch	delta	powerReal kW
Dynamic	Load_Dispatch	delta	powerReal kW
Emergency	Simple	Level	0, 1, 2, 3
PR Bid	Load_Dispatch	delta	powerReal kW
	Electricity_Price	price	$/kWh
PR Discovery	Load_Dispatch	delta	powerReal kW
	Electricity_Price	price	$/kWh
Dynamic Operating Envelope	x-Import_upper_limit		
	x-Export_lower_limit		
Battery	Load_dispatch	setpoint	powerReal kW

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Key Findings

- **Proven interoperability** between EDB, flexibility supplier and end devices demonstrated by actively managed charging of Electric vehicles and batteries connected to solar arrays
- Open communication standards / protocols are a **key enabler** of flexibility
- Agreed industry standardisation of protocols will provide **enhanced interoperability**, real-time data exchange, improved flexibility and scalability
- The two most mature open communication protocols are **OpenADR and IEEE 2030.5**, each have advantages specific to their intended use case
- International adoption of standard protocols vary due to individual needs and context
- While **simple APIs** allow industry to participate in flexibility, they **are short-term solutions** and will hinder long-term participation, interoperability, scalability and security.
- Assessment of OpenADR within FlexTalk met all defined assessment criteria for “least-regrets” functionality to enable flexibility

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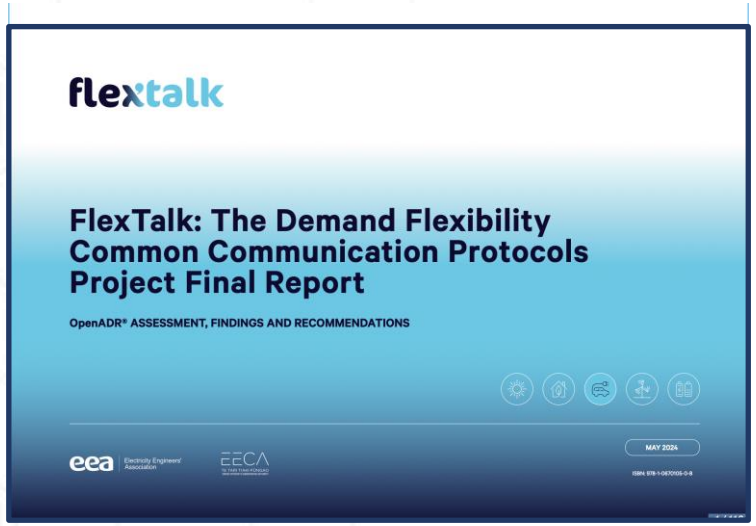
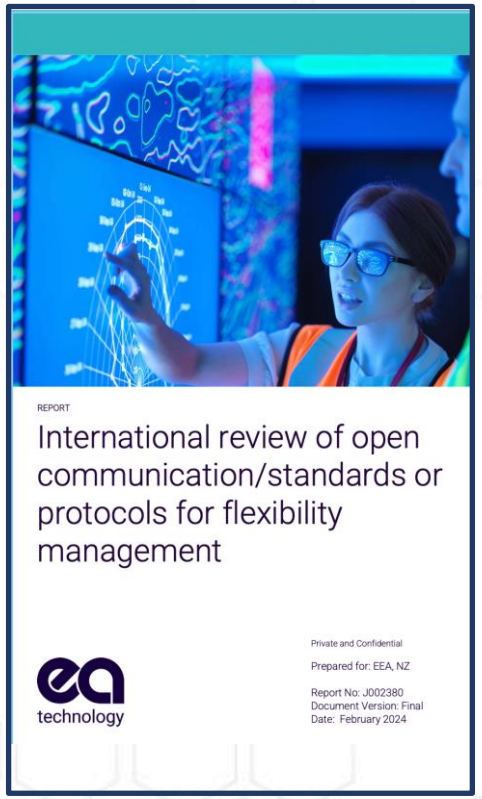
Key Findings

https://eea.co.nz/what-we-do/projects/flextalk/





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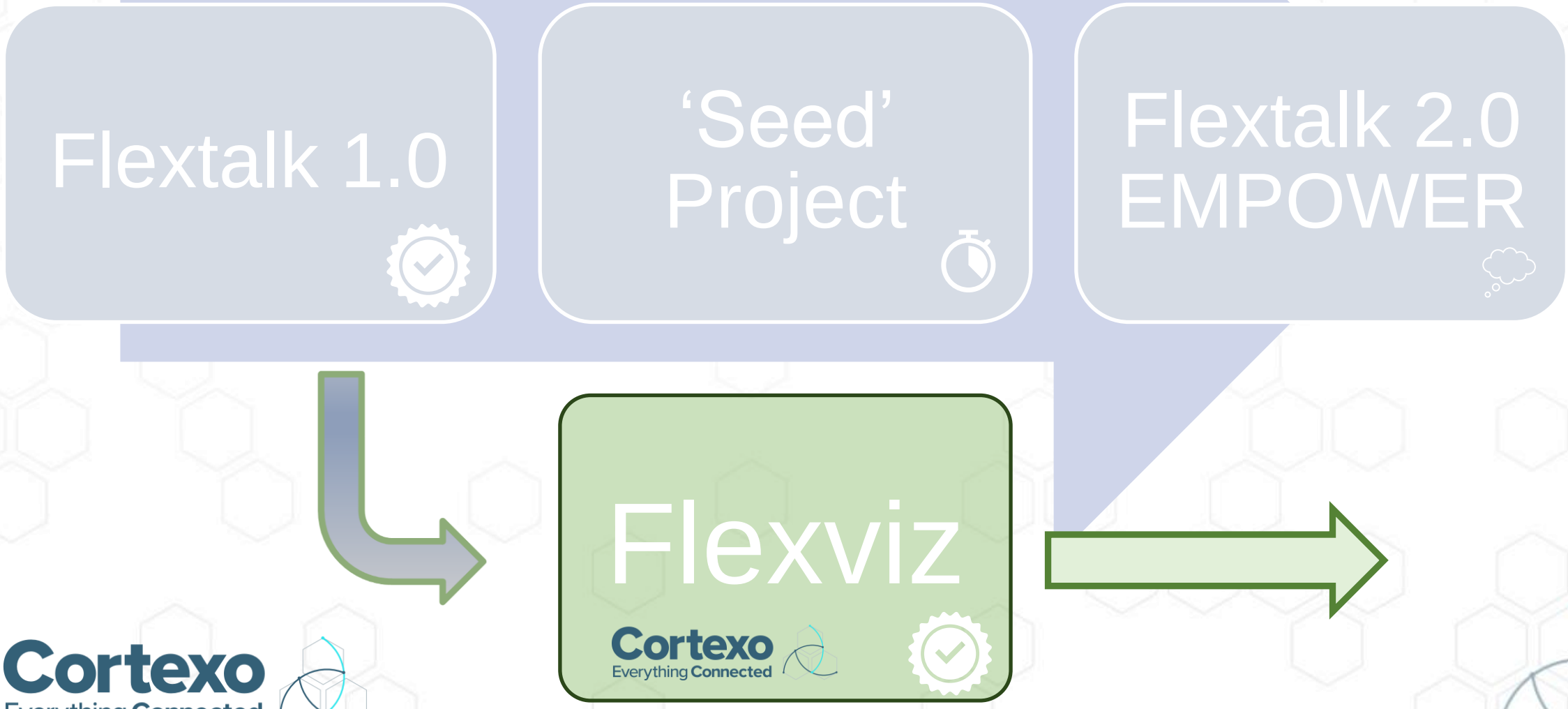
Flexviz – A shop window for flexibility



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Flexviz – A shop window for flexibility

- Show in near real-time available flexibility at every Grid Exit Point on the Transmission Network
- Show that the Flexibility is ‘dispatchable’

KPI’s (Goals)

- A growing amount of visible flexibility
- Commercial arrangements being made to access that flexibility

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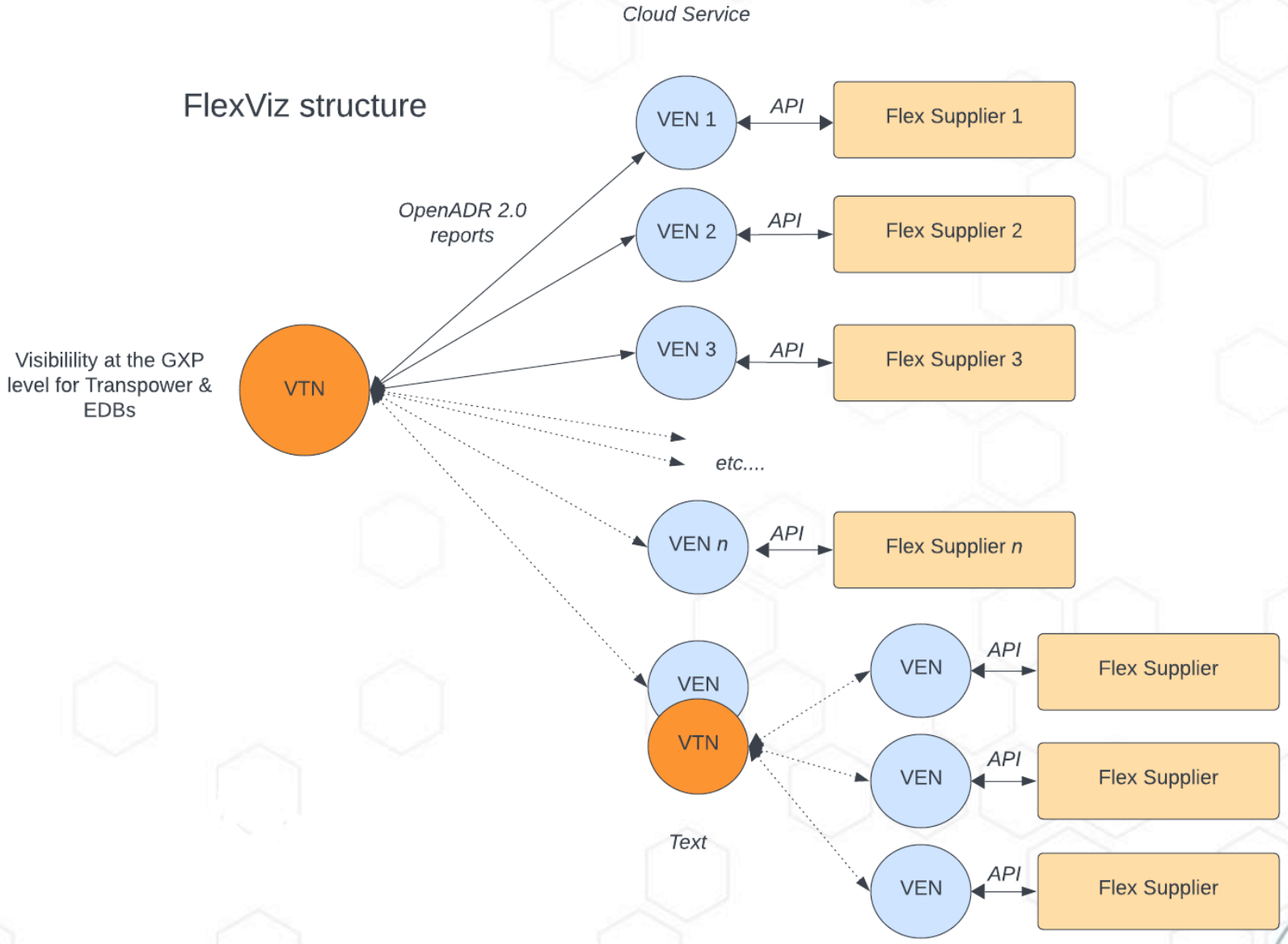
Flexviz – A shop window for flexibility



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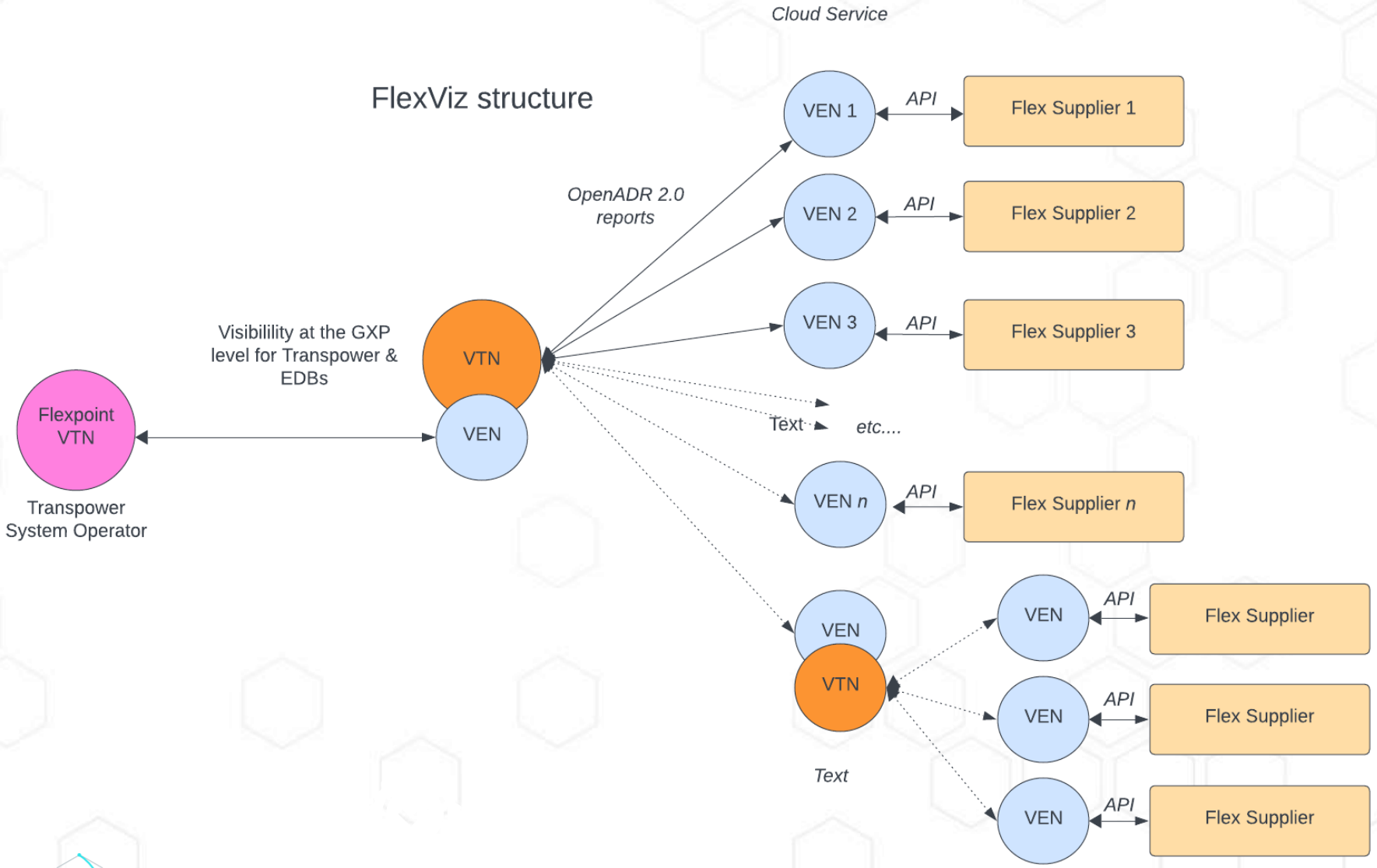

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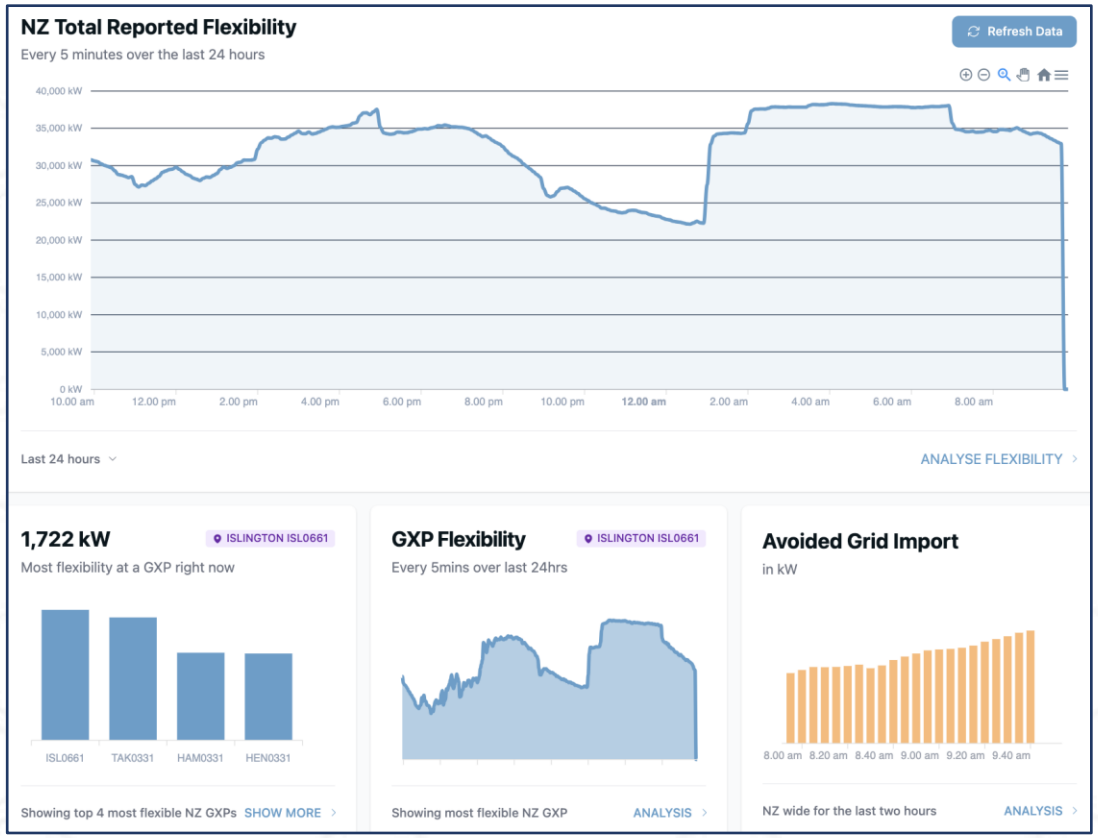

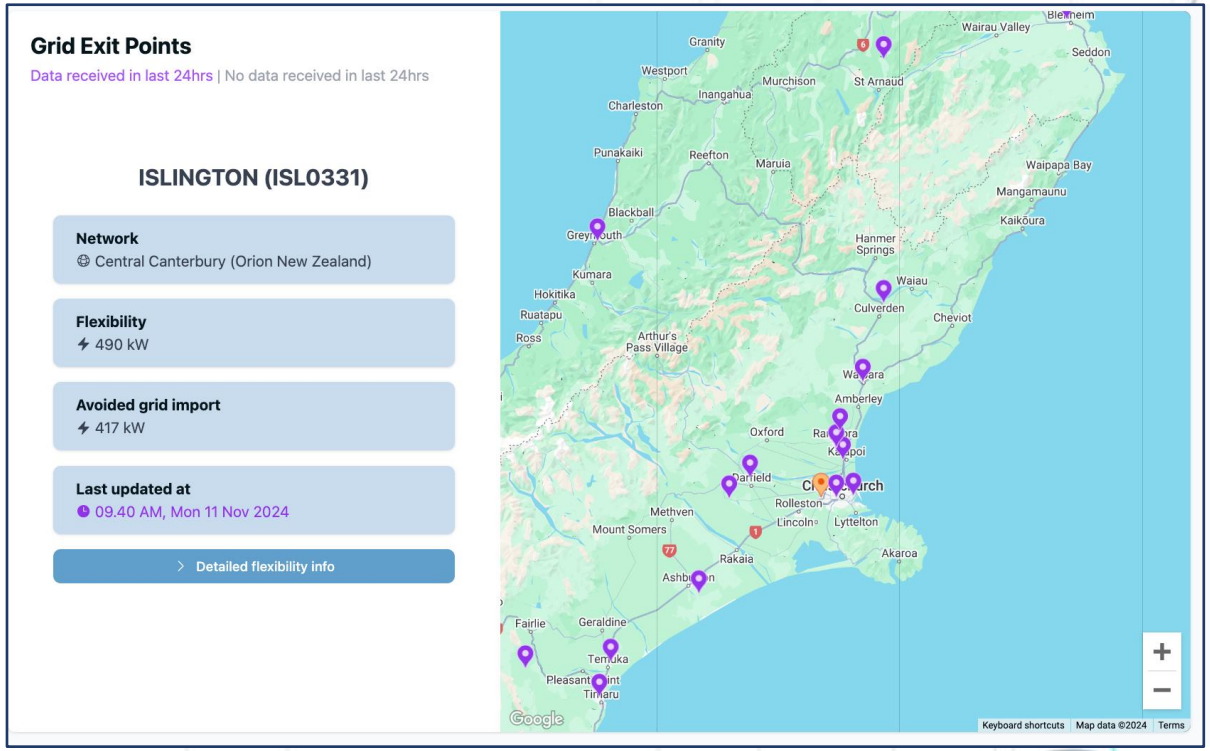

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Flextalk ‘Seed Project’

Flextalk 1.0

‘Seed’ Project

Flextalk 2.0 EMPOWER

Flexviz

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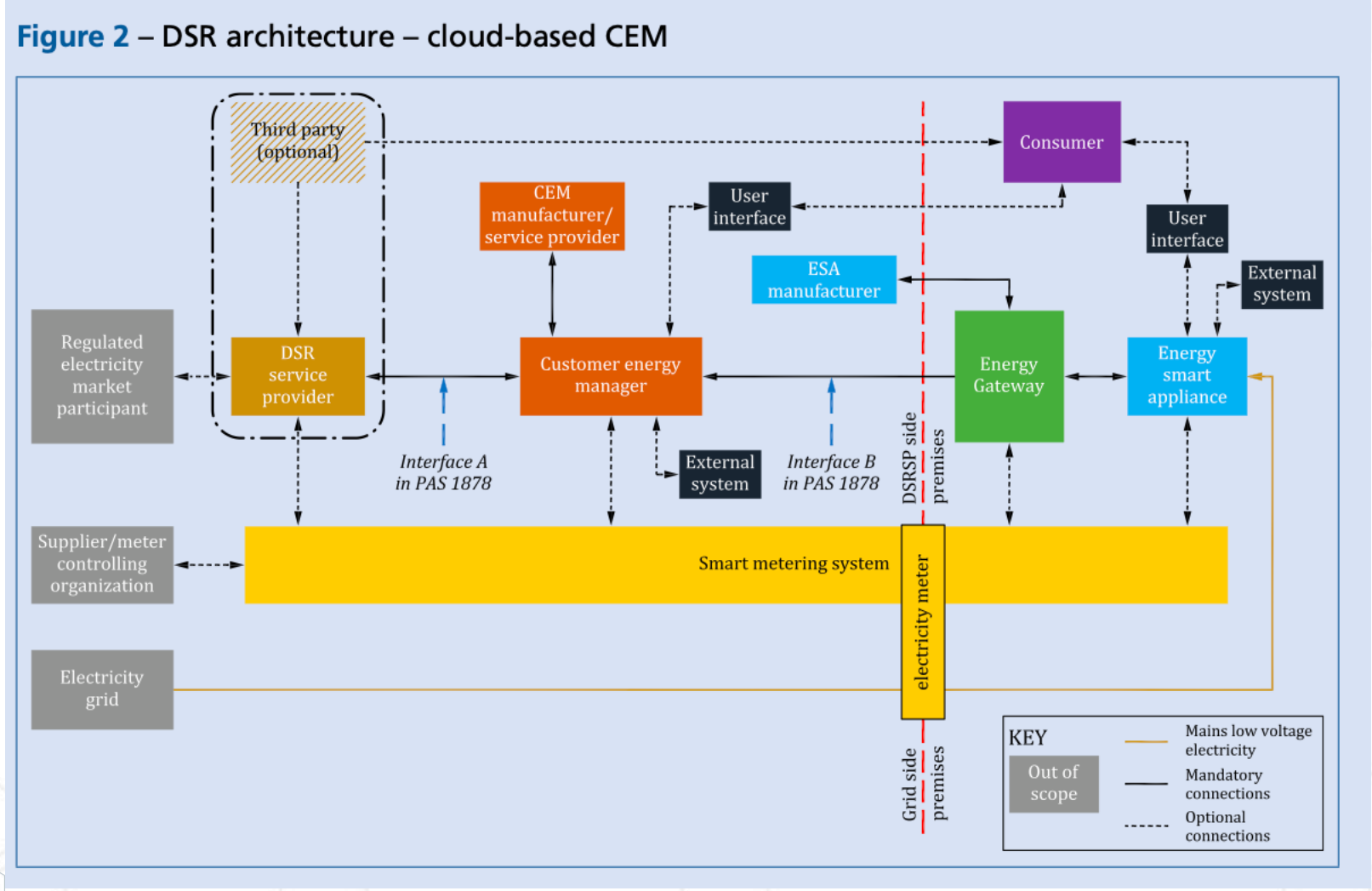
The Seed Project

- Identify potential technologies and standards
- Identify components for FlexTalk EMPOWER project planning
- Provide a starting point for the design team
- Guide / input to EEA's Streamlining Connections Program

The Seed Project

PAS 1879:2021 - Energy smart appliances – Demand side response operation – Licensed Code of practice

Figure 2 – DSR architecture – cloud-based CEM



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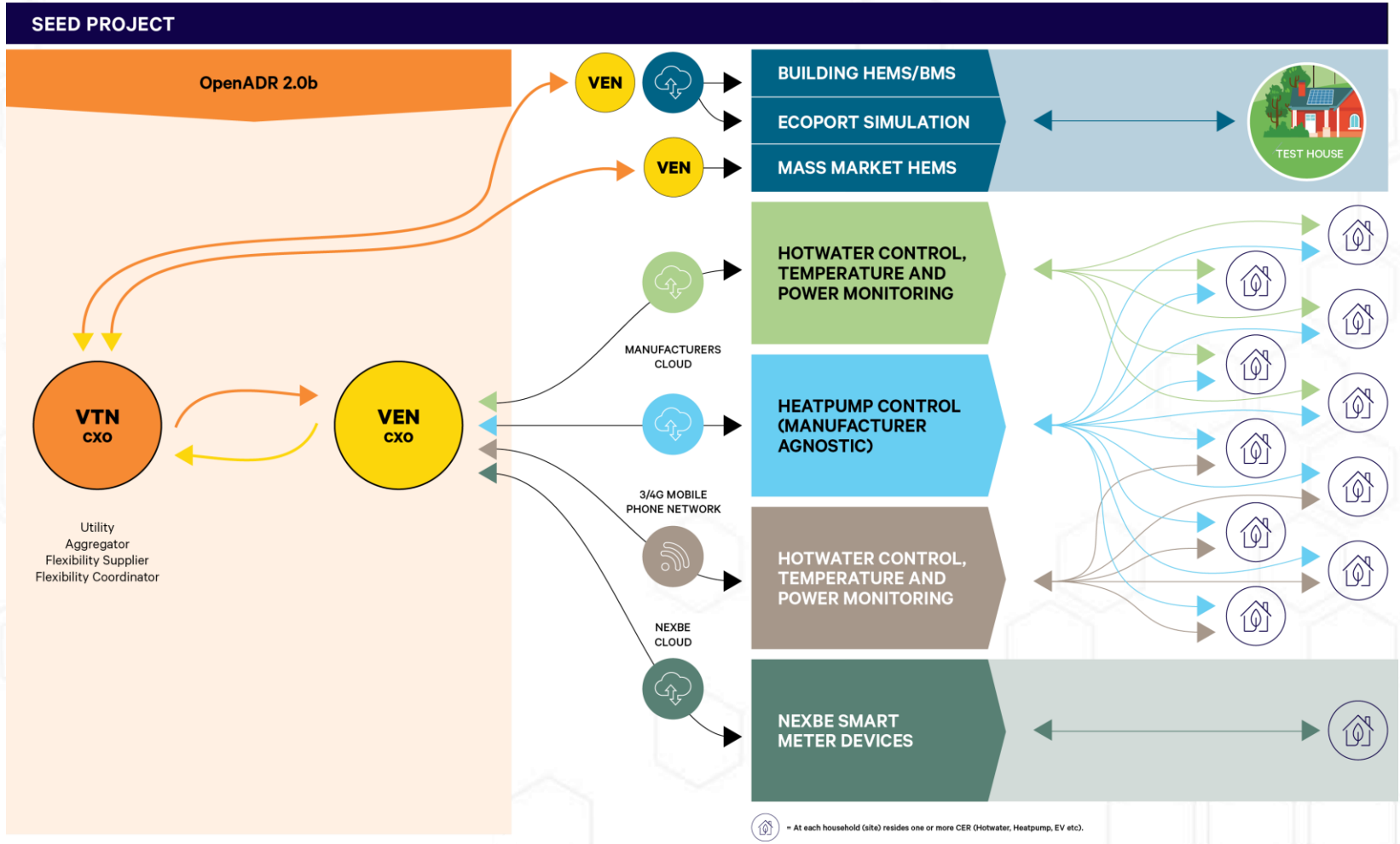
The Seed Project



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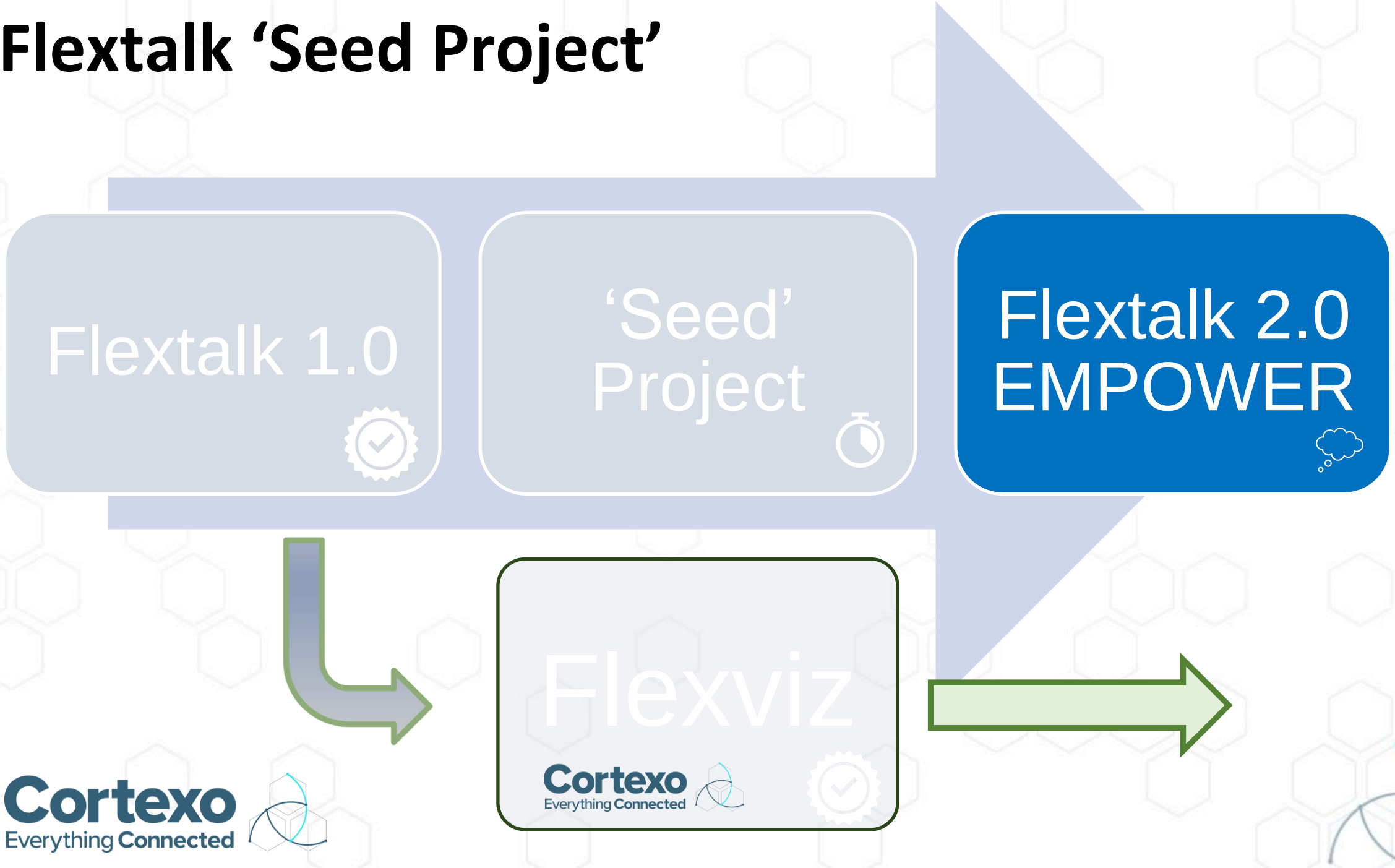
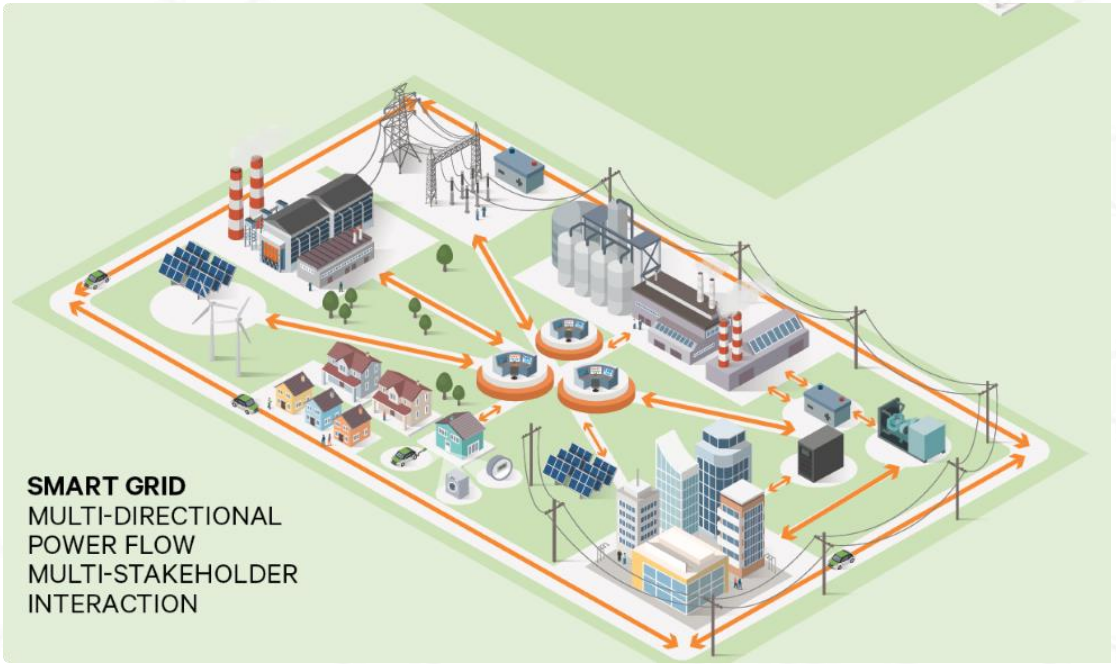


Flextalk 2.0 EMPOWER (starting 2025)

Vision:

Delivering seamless integration of consumer smart devices and homes into NZ's energy system to ensure safety, affordability and resilience for the future.



Purpose:

Collaboratively trial the active management of smart appliances (CER) with participants in the electricity industry and consumers to understand how CER is best integrated into the energy system with maximum benefit to the consumer.

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Flextalk 2.0 EMPOWER

Consumers:

- Targeting minimum 500
- Residential – urban (standalone / unit blocks) and rural
- Small business (big box retail)

Delivery partners:

- Electricity distribution businesses
- Flexibility suppliers (aggregators / retailers)
- Technical provider (system integration / implementation support)
- Technology suppliers
- Training partner(s)

Consumer Energy Resources:

- Home energy management system (HEMs)
- Premises energy management system (PEMs)
- EV and EV chargers (including V2G capable)
- Heat pumps
- Hot water systems
- Solar / PV
- Batteries

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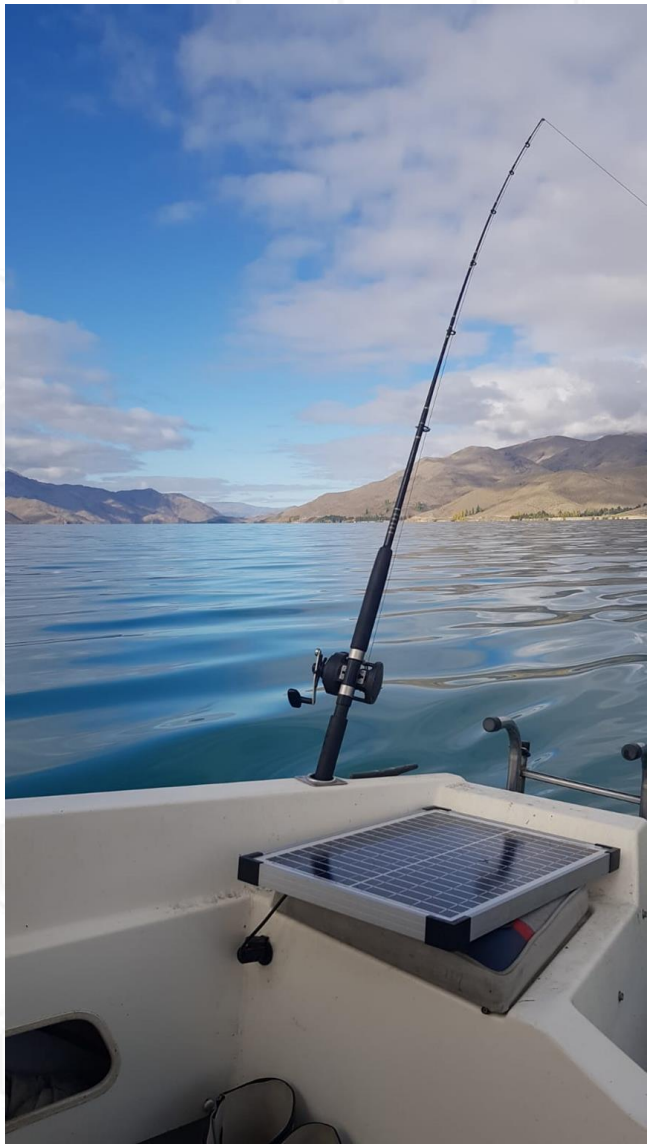

Questions or Comments?

Are we on the right track?

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