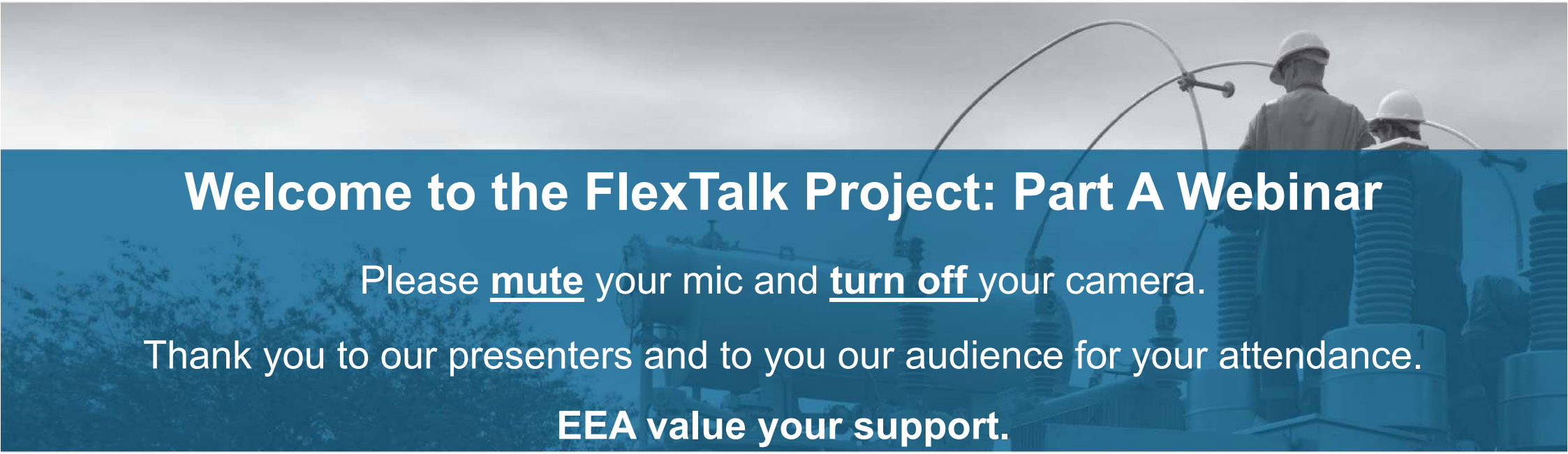
Electricity Engineers' Association

ASSET MANAGEMENT



Welcome to the FlexTalk Project: Part A Webinar

Please **mute** your mic and **turn off** your camera.

Thank you to our presenters and to you our audience for your attendance.

EEA value your support.

Please note. This webinar will be recorded and shared on the EEA website.

EEA.CO.NZ

EEA & EECA

The Electricity Engineers' Association ("EEA") provides a focal point for collaboration and thought leadership in engineering, safety and asset management across the electricity supply industry.

The EEA enables members to continuously learn and develop in a dynamic and rapidly changing environment.

EECA is a Crown agency, established under the Energy Efficiency and Conservation Act 2000 to encourage, promote and support energy efficiency, energy conservation and the use of renewable sources of energy. EECA's purpose is to mobilise New Zealanders to be world leaders in clean and clever energy use. It strives for a sustainable energy system that supports the prosperity and well-being of current and future generations.

Introduction

Today we will share our experience designing, implementing and trialing Flexibility services, utilizing Part A of the OpenADR communications protocol between EDB's & Flexibility Suppliers to achieve active managed charging of EV's

Stuart Johnston
EEA

Rodger Griffiths
ElectroNet

Terry Paddy
Cortexo

Connie Dunbar
EEA

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Agenda

- Scene setting – decarbonisation / EV growth
- Future Network Operations, The market model
- Why OpenADR has been selected for trial
- Our implementation of OpenADR (Technical)
- Our trial (customers, flexibility services)
- Our findings (event outcomes, customer experience, EDB experience)
- What did we learn? (wider flex learnings)
- What next?

Speaker 01. Stuart Johnston

Dr Stuart Johnston

Principal Advisor – Engineering & Technical, EEA

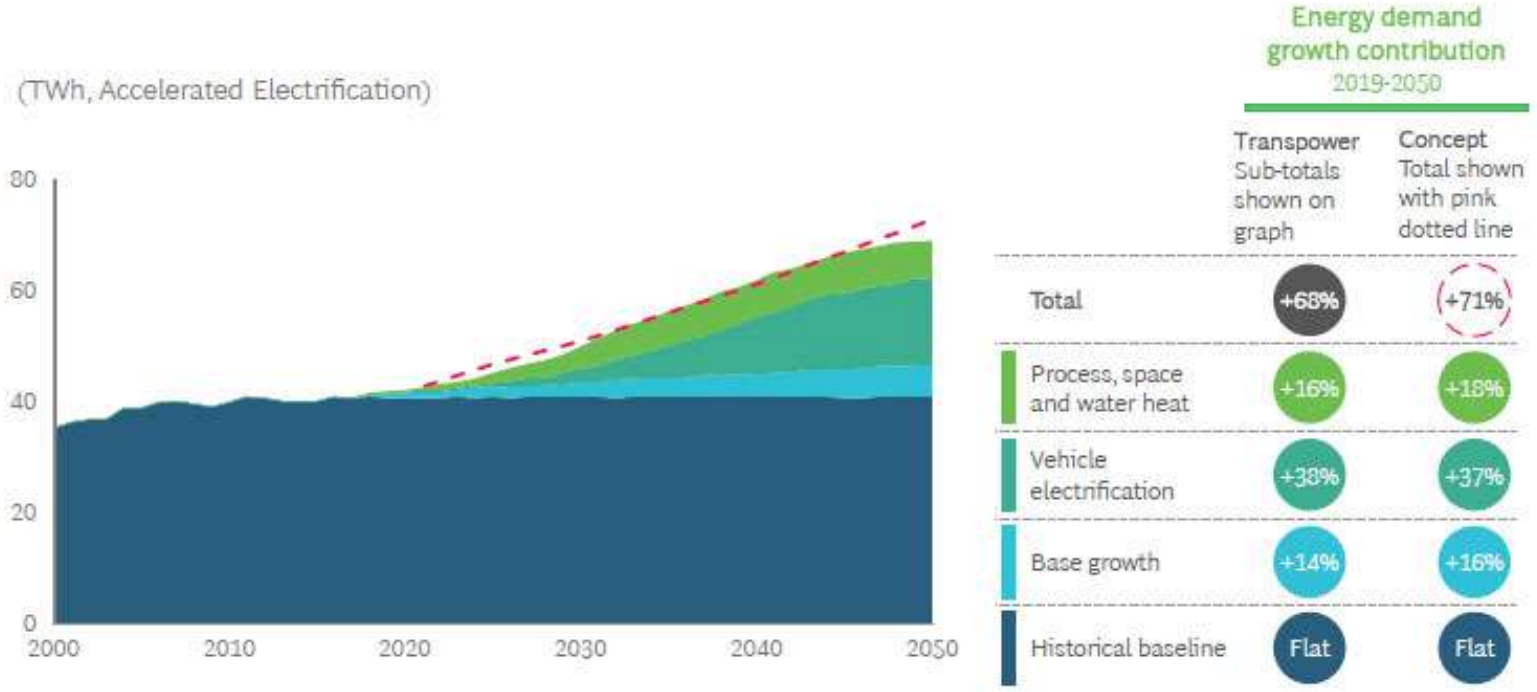
Agenda:

- What challenges / opportunities do we face in the energy transition?

Background

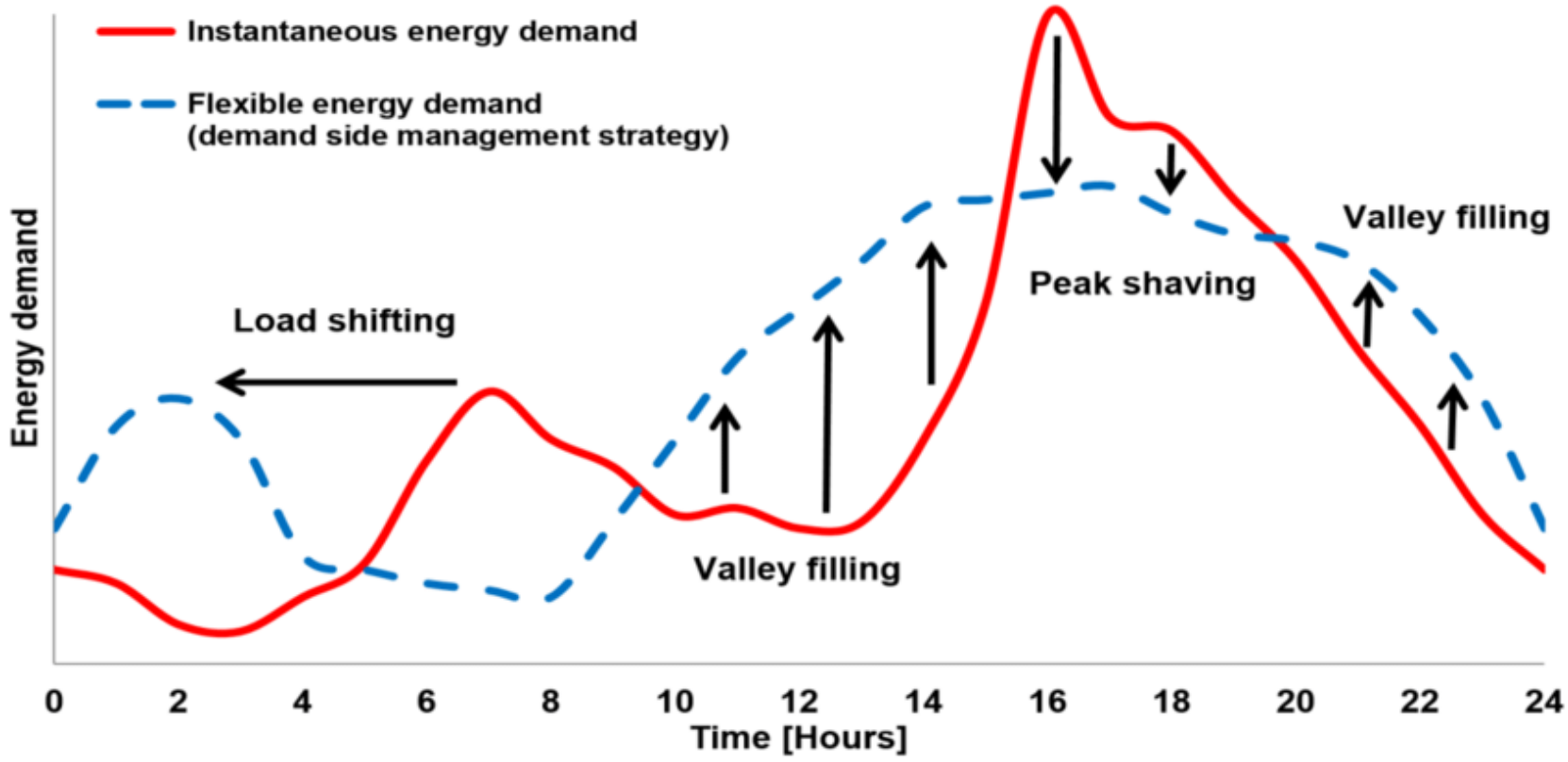
- Aotearoa's journey to meet our net zero by 2050 decarbonisation goals will be challenging.
- Electrifying transport and heat, and increasing renewable electricity, will be the most significant contributors to New Zealand achieving net zero carbon by 2050.
- One of the key enablers to support electrification will be the establishment and implementation of demand flexibility mechanisms.

Increase in Aotearoa's Gross Electricity Demand by 2050

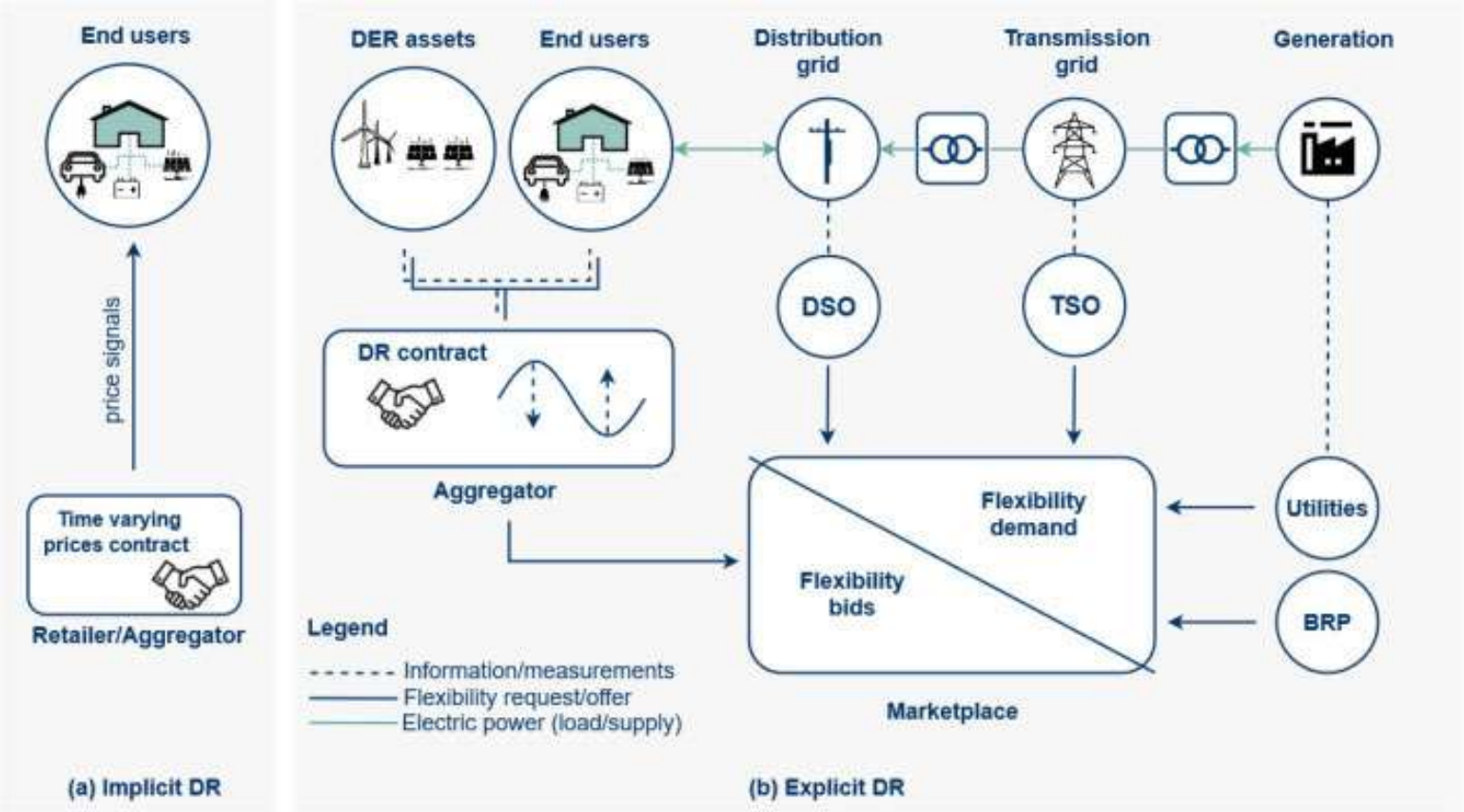


Source: Transpower Whakamama i Te Mauri Hiko (March 2020) - Accelerated Electrification Path; Concept Consulting, BCG analysis

Why is Developing Demand Flexibility Important?



What is Demand Flexibility?



Speaker 02. Rodger Griffiths

General Manager Generation & Technology, Westpower

Agenda:

- Project background

FlexTalk - The Demand Flexibility Common Communications Protocol Project

The project is a collaborative partnership between industry (represented by EEA) and EECA to evaluate 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.

Project Context

- Open communication protocols are internationally acknowledged as a prerequisite to a fully demand flexible electricity system.
- The most successful (and widely adopted) open communication protocols are grounded in international standards.
- OpenADR as a ‘dispatch’ protocol is ideally designed to deliver an exemplar of functional demand flexibility in NZ.
- OpenADR is ideally configured to interface with the most common communication protocol used in EV chargers globally - OCPP v1.6 and above.

Project Objectives

1. Determine the use cases for flexibility services to be communicated and create process maps for these.
2. Assess the advantages and limitations of OpenADR within the New Zealand context, including a high-level comparison against other communication protocols.
3. Demonstrate interoperability of communication protocols between EDB's, EV flexibility suppliers and consumers.
4. Assist industry participants in understanding the systems investment involved with utilising flexibility services.

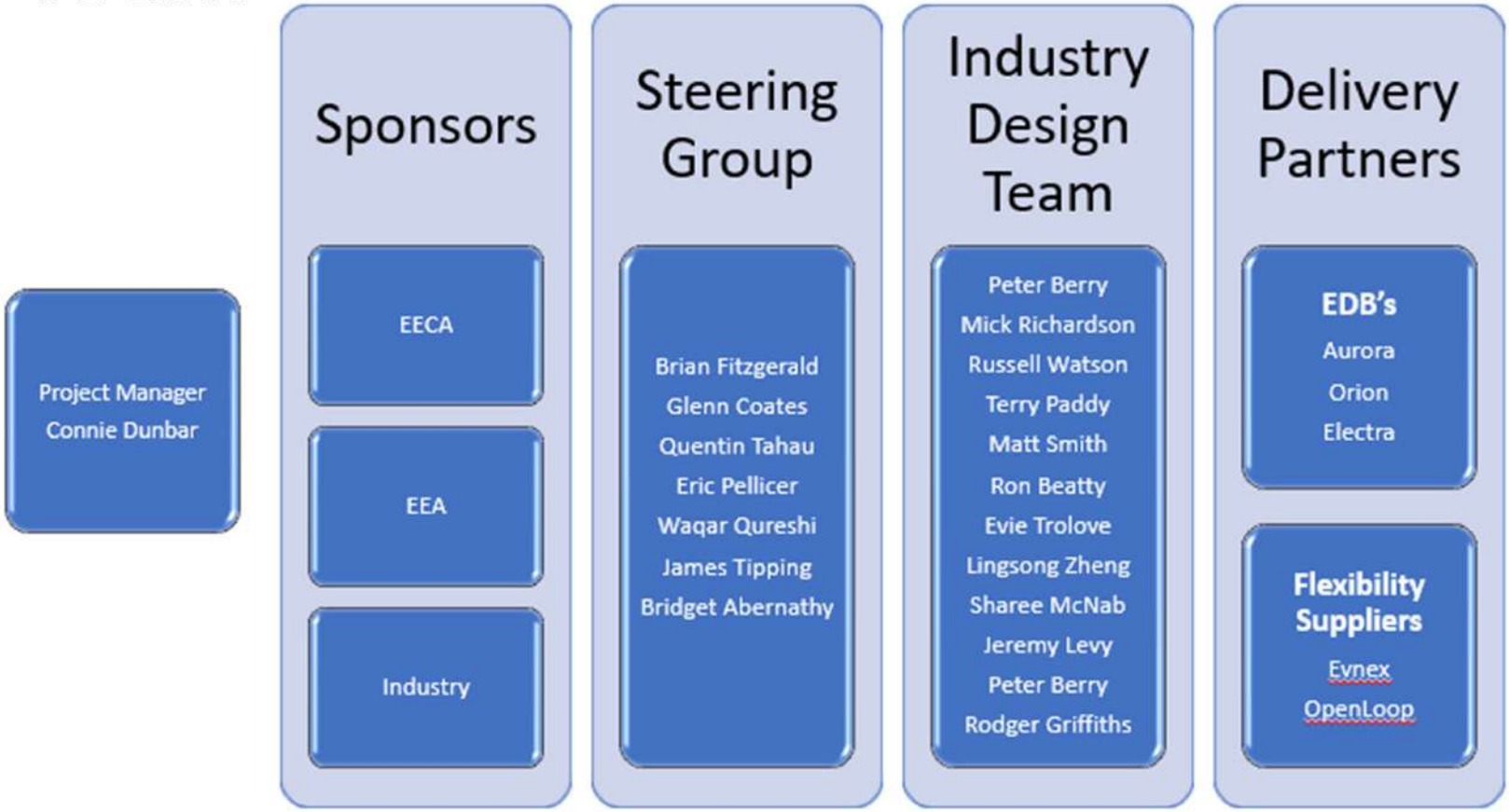
OpenADR demonstration - alternate DER type

- The FlexTalk project has the opportunity to bring in wider learnings by including SolarZero as a delivery partner.

- Enables the testing of a battery programme to request flexibility with Solar PV between an EDB and Solar provider.

- Inclusion of Solar Zero allows demonstration of OpenADR with an alternate DER type (PV and batteries) and the ability to compare the API solution (alternate communications protocol)

Our Team


Project Manager
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Sponsors
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EEA
Industry
Steering Group
Brian Fitzgerald
Glenn Coates
Quentin Tahau
Eric Pellicer
Waqar Qureshi
James Tipping
Bridget Abernathy
Industry Design Team
Peter Berry
Mick Richardson
Russell Watson
Terry Paddy
Matt Smith
Ron Beatty
Evie Trolove
Lingsong Zheng
Sharee McNab
Jeremy Levy
Peter Berry
Rodger Griffiths
Delivery Partners
EDB's
Aurora
Orion
Electra
Flexibility Suppliers
Evnex
OpenLoop

Project Timeline

Industry Engagement	Establishment Part A	Establishment Part B	Select Delivery Partners	Protocol Implementation	Template Development	Disseminate Learning
April '22 - Engaging with industry and regulators.	**July '22** - Project team & Steering group established - Partner selection criteria developed - Project timeline - Industry survey	**August '22** - Industry committed to project and funding received.	**October '22** - Select and develop agreements with the delivery partners, EDBs and Flexibility Suppliers.	**Part A: April '23** **Part B: Dec '23** - Phase one: To achieve the OpenADR 2.0 part A standard. - Phase two: To achieve the OpenADR 2.0 part B standard. - Industry consultation	**March '24** - Template developed providing the industry with the approach and guidance.	**April '24** - A series of webinars and training opportunities for the industry.
Stage gate 1 and 2	**Stage gate 3 and 4**	**Stage gate 5 and 6**	**Stage gate 7**	**Stage gate 8**	**Stage gate 9**	

We are here

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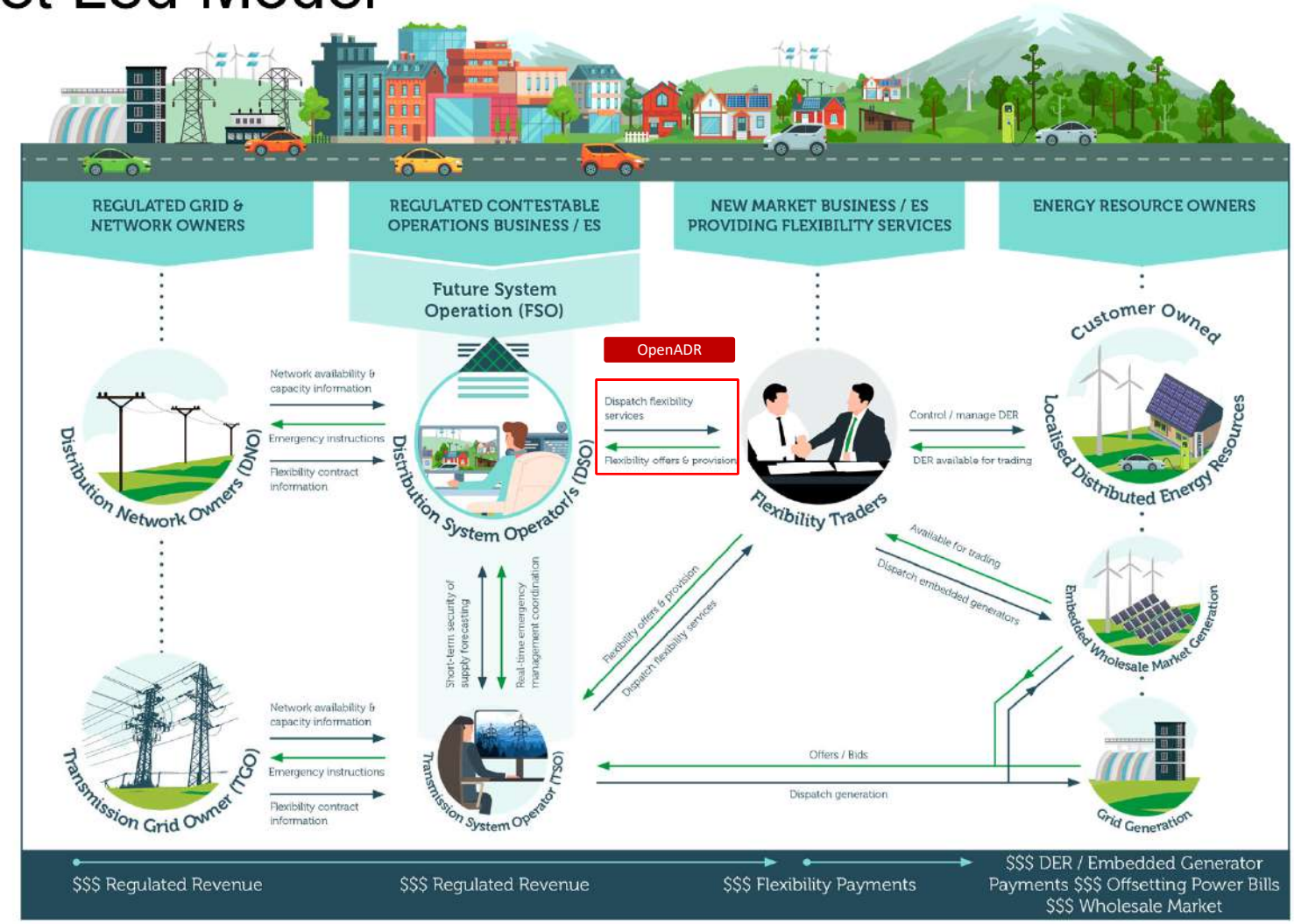
A Market Led Model



Protocol Selection

OpenADR

- Mature demand response protocol
- More suited to interfacing EDB's and Flex Suppliers
- Transpower already had an operational head end (VTN)

IEEE 2030.5

- Used in Australia for PV Management
- Suitable for interfacing directly with flexibility hardware
- Built on an IoT Concept

Speaker 03. Terry Paddy

Managing Director, Cortexo

Terry Paddy

Agenda:

- Technical Implementation
- FlexTalk flexibility services (programmes)

Sustainable Energy Association New Zealand

FLEXFORUM

openADR ALLIANCE

IEEE STANDARDS ASSOCIATION

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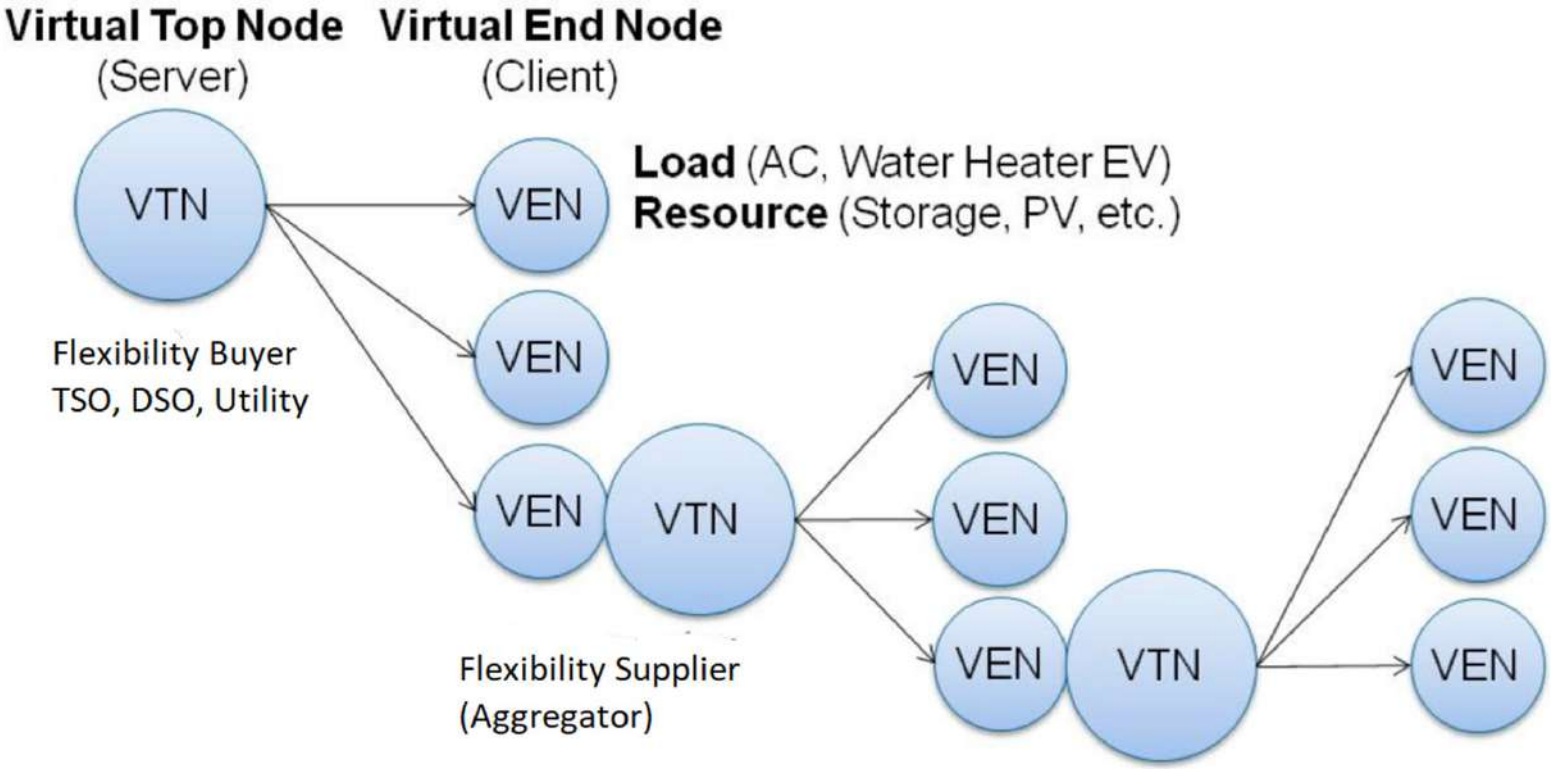
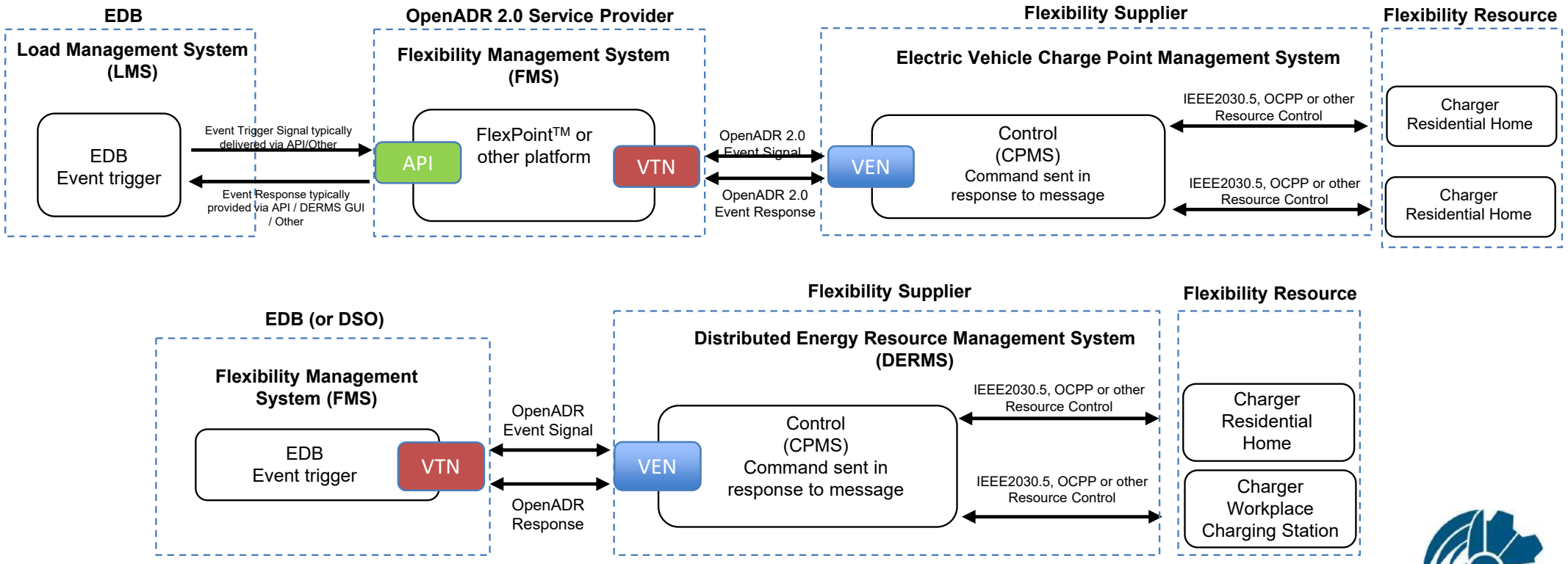
OpenADR hierarchy



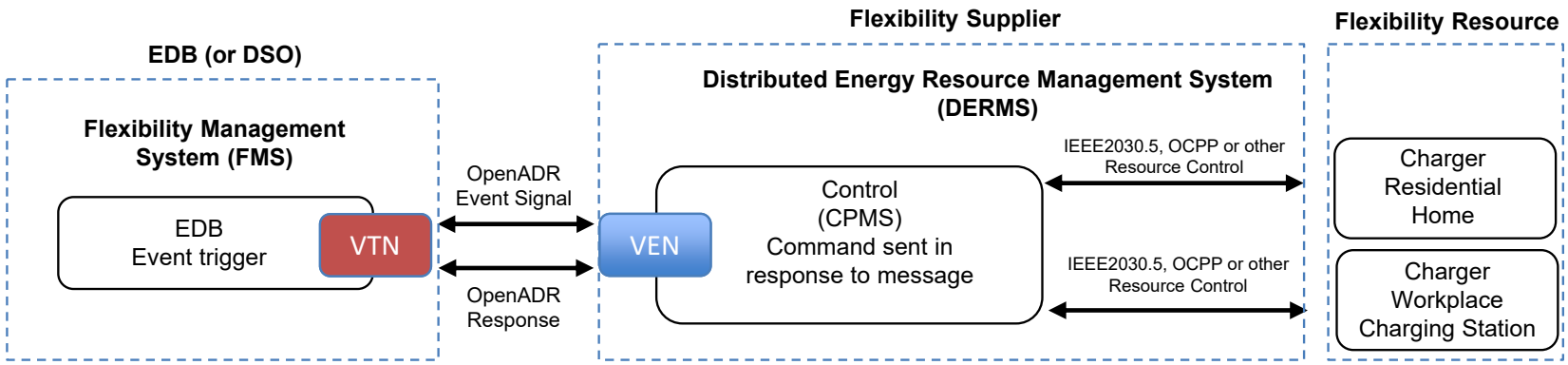
The Project Model

Trial Configurations



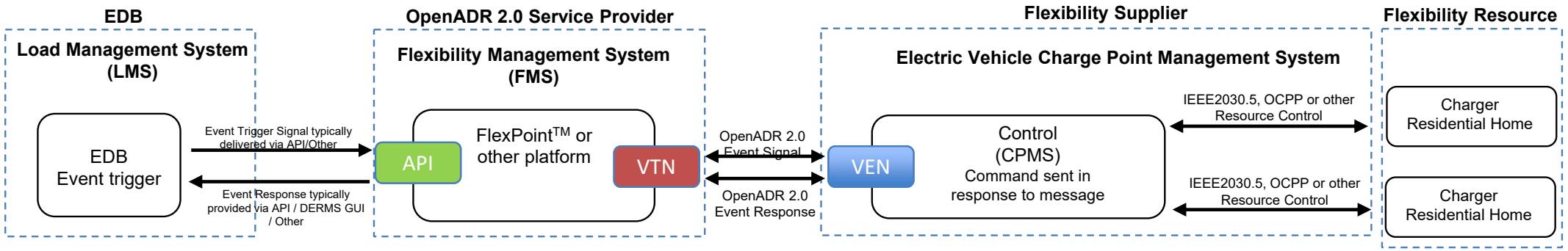
The Project Model

Trial Configurations



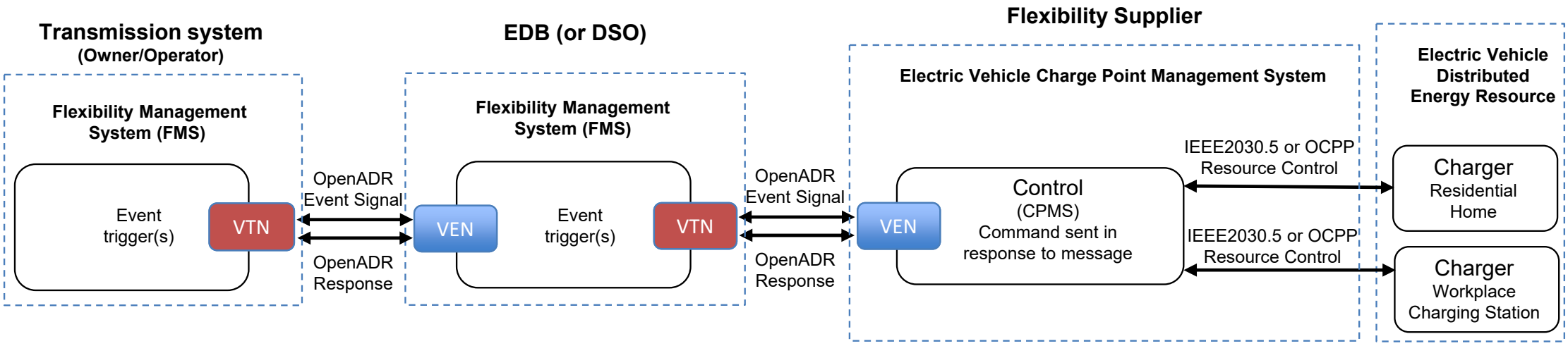
The Project Model

Trial Configurations



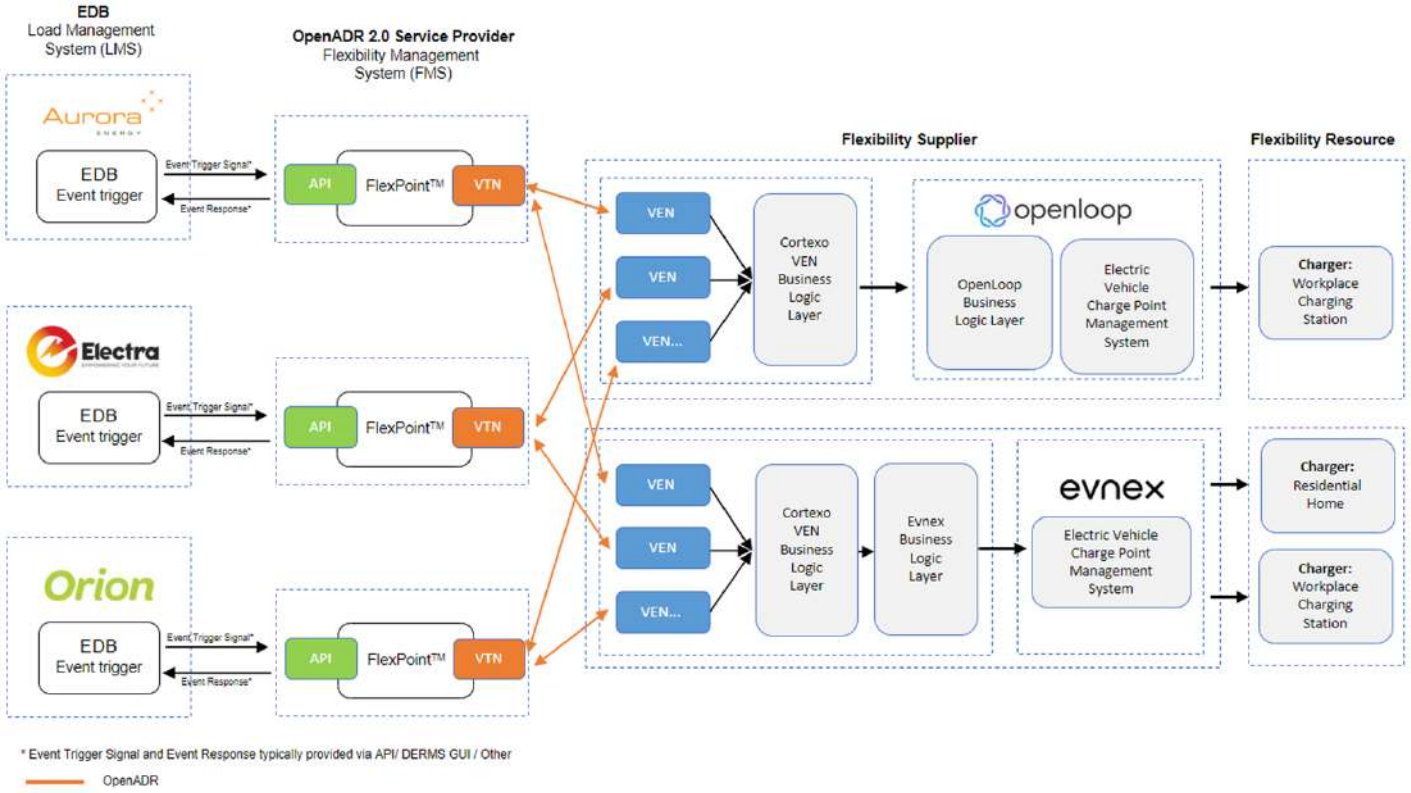
The Project Model

Possible Future State



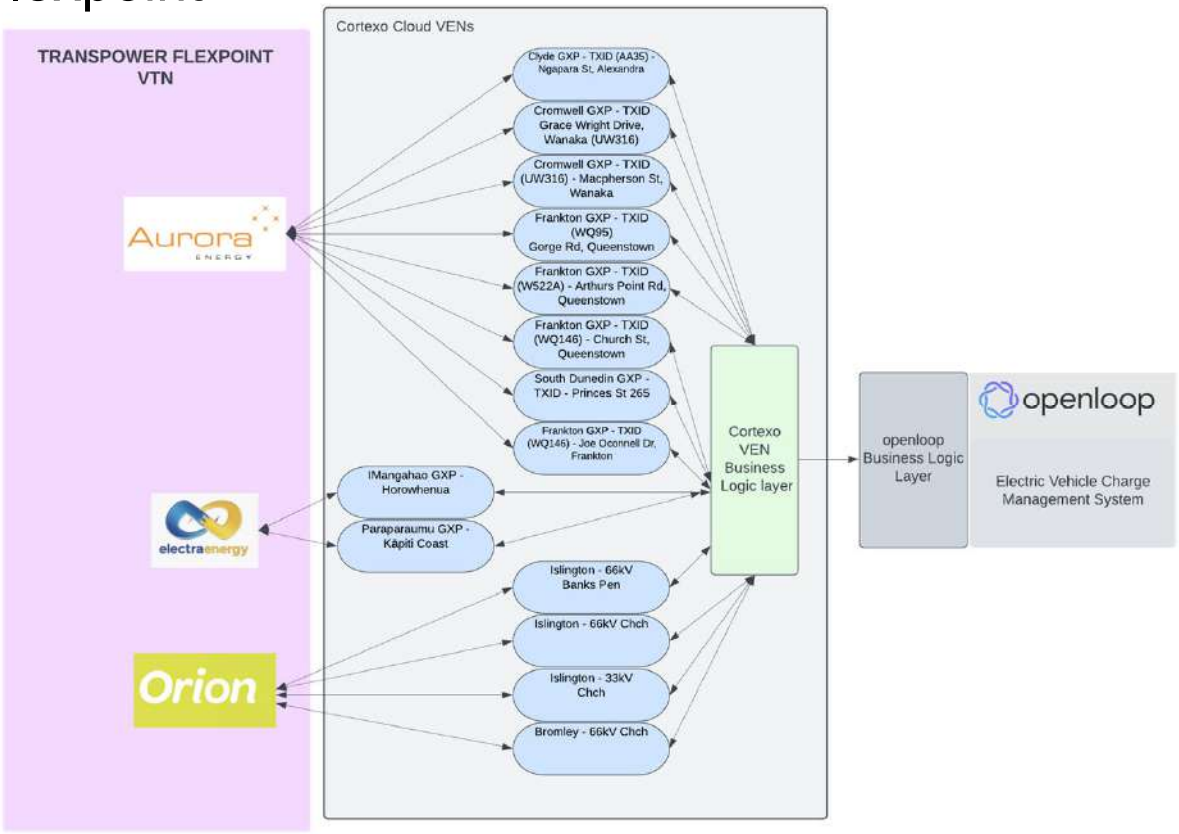
Technical Implementations

EDB's / Flexibility Suppliers

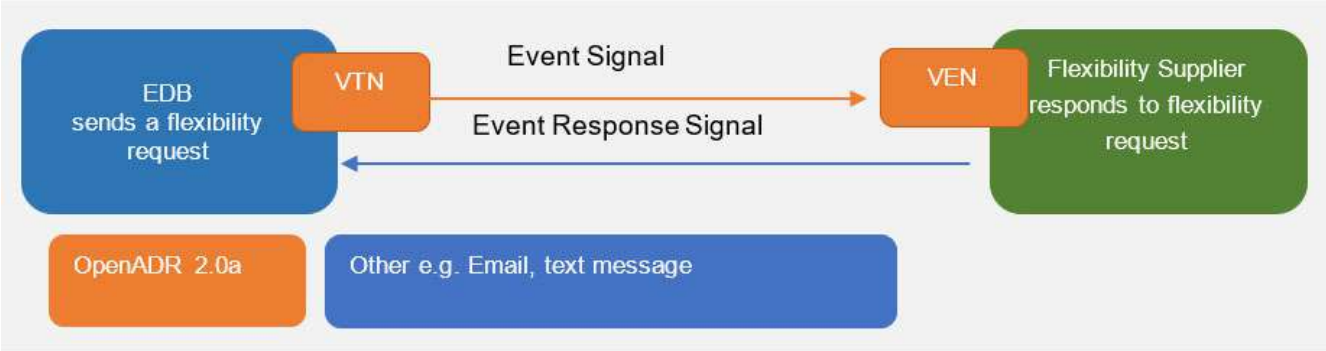


Technical Implementations

Using Transpower's Flexpoint®



Message Flow – Part A & B



Part A message flow

Part B message flow

Part A
SIMPLE SIGNAL

OpenADR Simple Signal

- 0 – Do nothing
- 1 – Low
- 2 – Moderate
- 3 – High

Meaning

- 0 – Do nothing
- 1 – 50% reduction
- 2 – 75% reduction
- 3 – 100% reduction

Reduction from a set baseline capacity

Part A Programmes

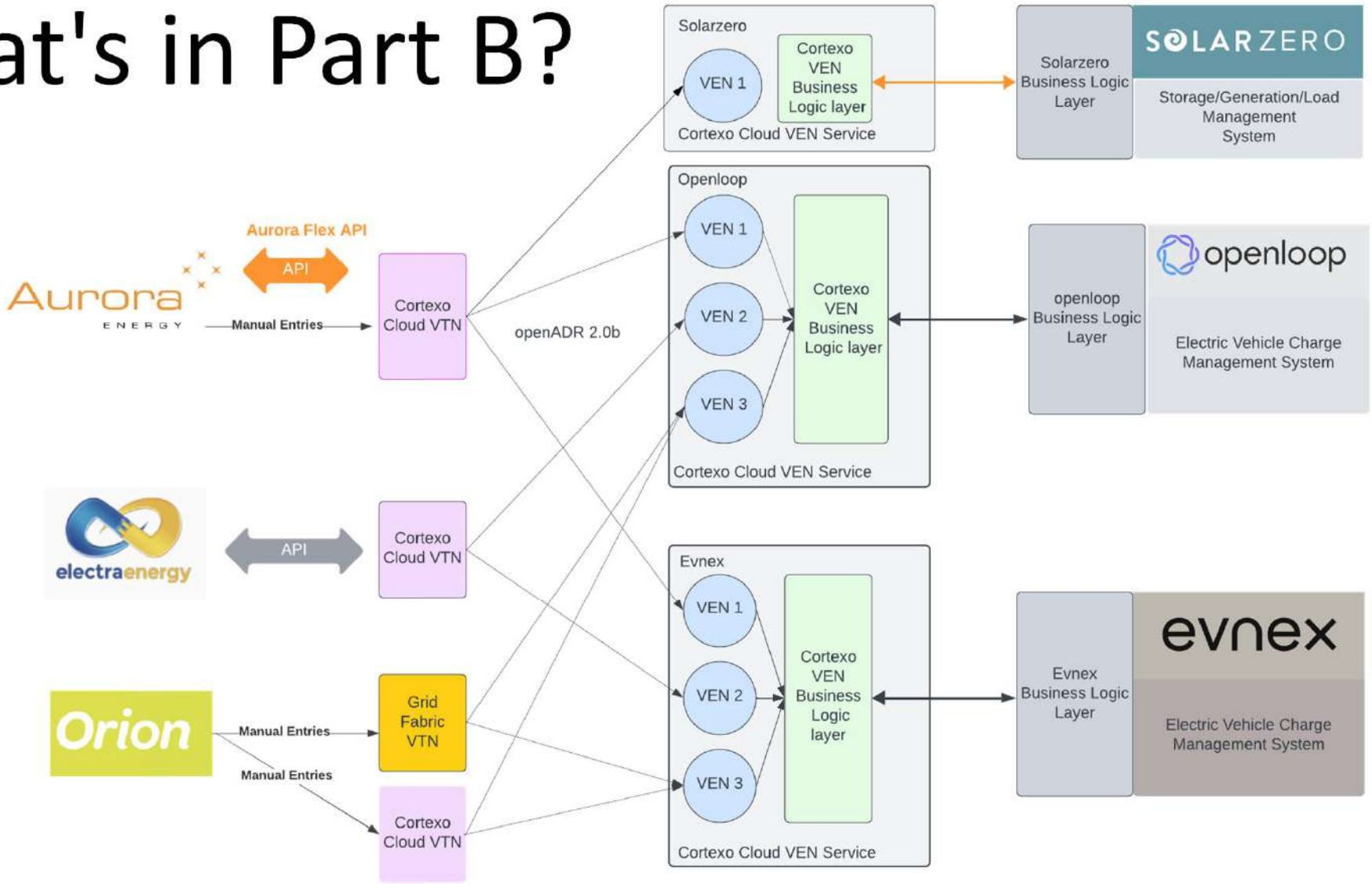
1. In Advance
2. Immediate (Dynamic)
3. Price Responsive Bid
4. Price Responsive Discovery

Part A Programmes

- Discuss dynamic and emergency programmes

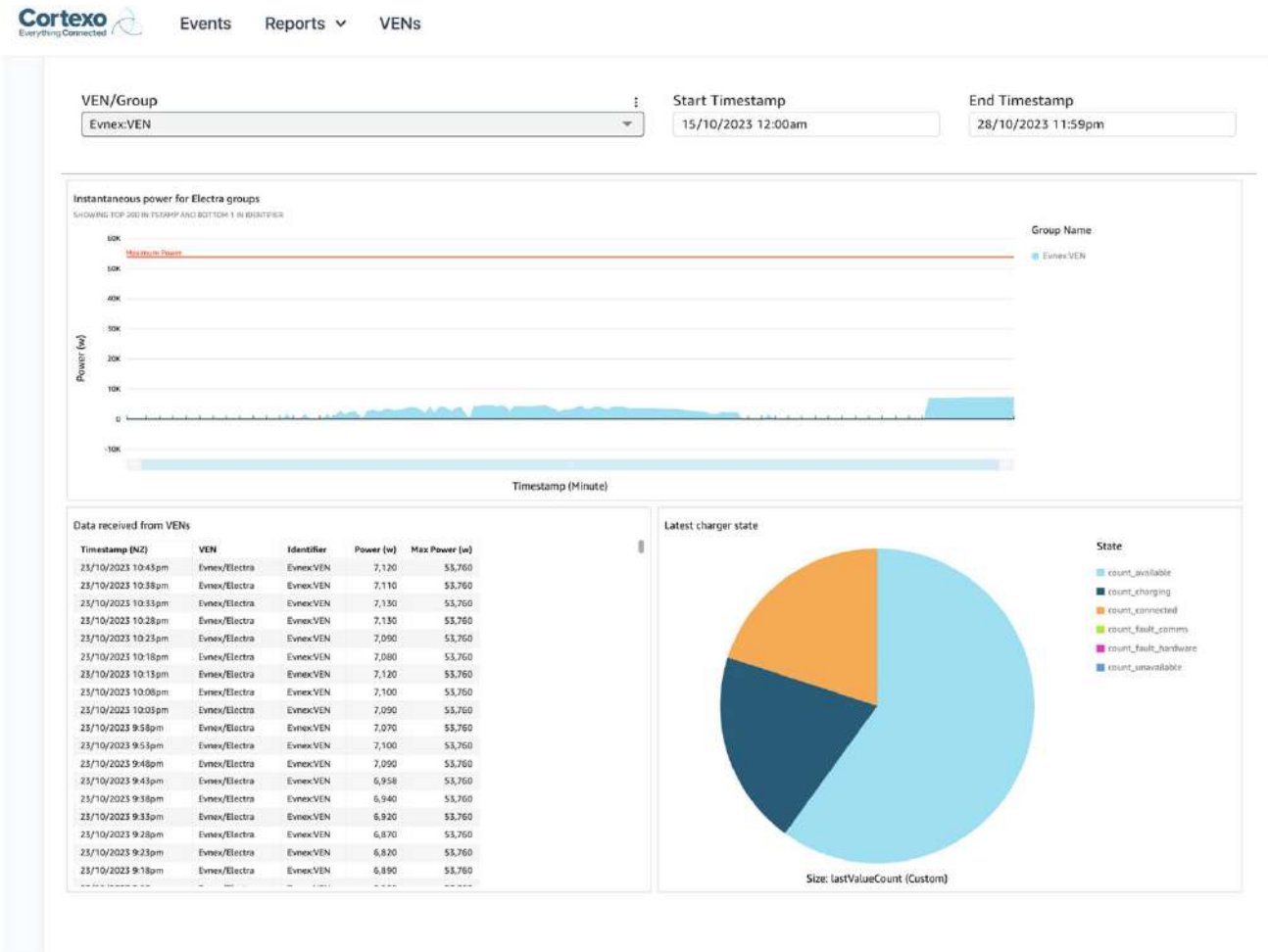
PROGRAMME	BASELINE		LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
Programme 02 Dynamic Short Term Non-Price Responsive	Flex Capacity **a.m.**	Flex Capacity **p.m.**	**0%**	**50%**	**75%**	**100%**
Programme 03 Immediate Emergency Non-Price Responsive	Flex Capacity **a.m.**	Flex Capacity **p.m.**	**0%**	**50%**	**75%**	**100%**

What's in Part B?



Complex Signals, API & Reporting

- In Advance
  - Load Dispatch – delta kW
- Immediate (Dynamic)
  - Load Dispatch – delta kW
- Emergency
  - Simple – 3 (!00%)
- PR Bid
  - Load Dispatch – delta kW
  - Electricity Price - $/kWh
- PR Discovery
  - -Load Dispatch – delta kW
  - (optional) Electricity Price - $/kWh
- Dynamic Operating Envelope
  - Max import
  - Min import
  - Max export



Speaker 04. Connie Dunbar

FlexTalk Project Lead, EEA

Connie Dunbar

Agenda:

- Part A Trial approach
- Part A Trial outcomes
- Wider Flexibility learnings

Part A – Designing Flexibility Programmes

- IDT Workshops to determine flexibility programmes
- EDBs – what do they need / want? (requirements for requesting flexibility)
- Flexibility suppliers – what can they provide? (what flexibility, what data)
- Determined triggers, programme behaviour and the type of interactions actors would participate in

Part A – Trial Approach

Customers

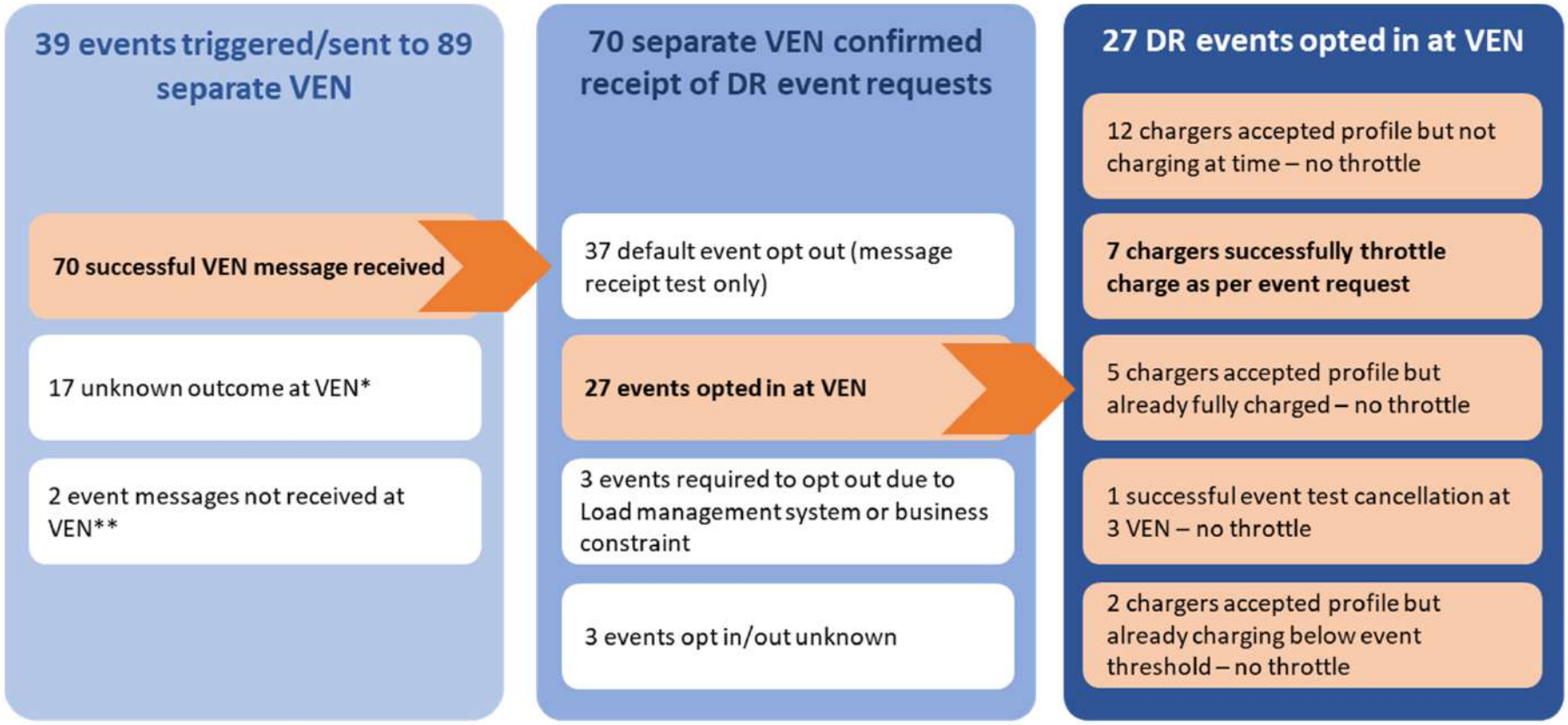
- 49 customers
- Mix of residential / commercial
- 89 chargers targeted during Part A

Part A – Trial Approach

Testing Schedule

- 3-4 events deployed per week
- Trial schedule
- Learnings canvas
- Assessment of events against success criteria

Event Overview



Due to limitations with data capture

***If the DR Level is not set in FlexPoint Flexibility Management System or the DR request is set to 0 kW, then no OpenADR events will be created.*

Customer Feedback

Customer surveyed at conclusion of Part A to assess:

- Awareness of active managed charging
- Impacts on charging routine / behaviour
- Potential financial impacts
- Further participation in EV charging trials
- Residential and commercial question set with Y/N and ability to comment

Customer Feedback

- No material impact reported, aware of throttle down but no disruption to charge availability
- Some customers mentioned the trial did impact their charging behaviour but didn't specifically call out how
- Commercial customers didn't notice a financial impact of participation in trial
- Residential customers did call out that the trial did impact their free hour of power
- Most respondents were willing to participate in demand flexibility events in future
- For commercial customers, they don't fully understand the commercial or customer value proposition

Delivery Partners Commentary

Learning curve for Part A:

- Terminology
- Interpretation
- Learning systems (FlexPoint)
- Exploring integration approaches - predominantly manual for Part A
- General call-out that the technology works but the wider implication of participation in demand flexibility need to be considered for this to be operationalised / scaled up

Delivery Partners Commentary

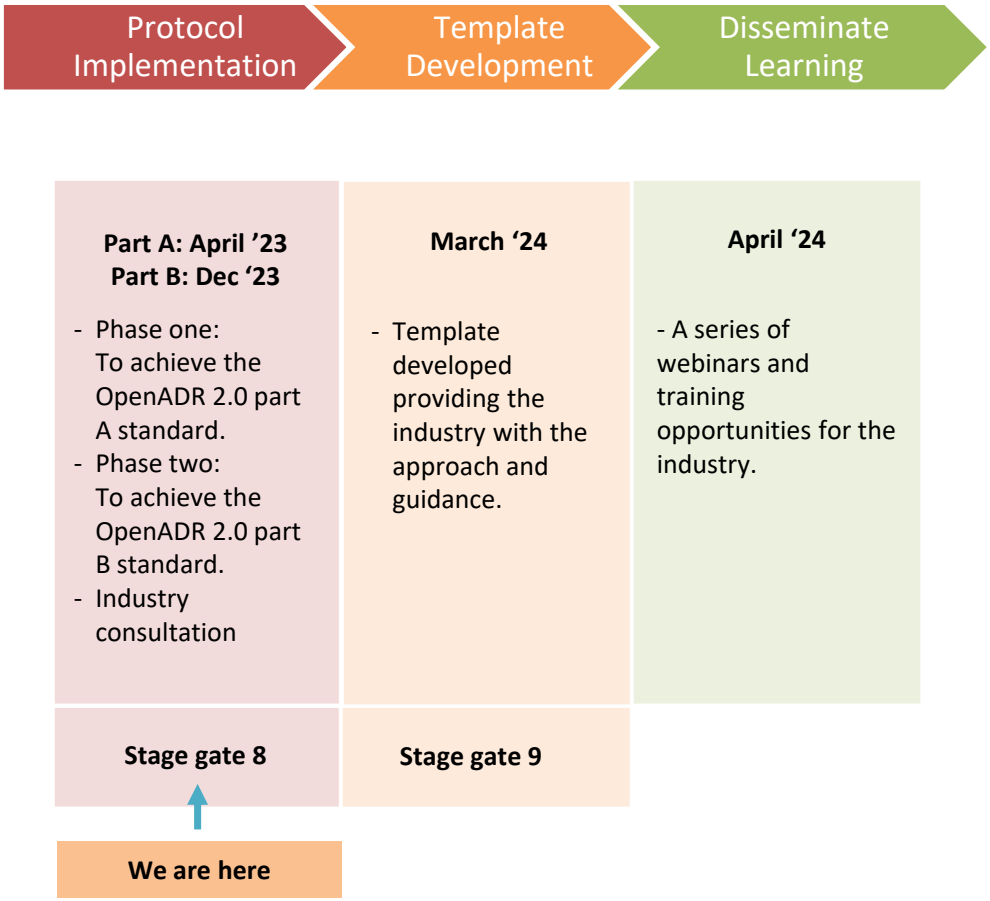
“None of this has been what I would call hard, it’s all work which needs doing and takes time and money, but the actual technical development has been a matter of working through a very familiar engineering process involving technical building blocks that I recognise from lots of other similar work. Scaling up will be much more a problem of commerciality and social license than a problem of technology"

– **Tom Rose, Evnex**

What else did we learn?

BUSINESS / COMMERCIAL	CONSUMERS	TECHNICAL	MARKET
• Contractual agreement design needs to be considered and will ultimately inform how actors participate in flex events	• Consumer buy-in, need to bring awareness to demand flexibility to gain social license • Evidence from trial recruitment process suggests that some customer segments may be more sensitive to the impacts of demand flexibility. • Customer privacy and obligations must be considered when designing data sharing approach. How do we balance customer data privacy with the availability of data to participate in flex events? E.g. Sharing ICP	• Need ability to access smart charging functions with all charger types. It was discovered during trial that troubleshooting required to access / control chargers for a key manufacturer. • Load management building rules may impact the ability for charger to accept smart charging profiles and thus inhibit access to assets for demand flexibility • It is essential that interpretation of terminology and behaviour is understood across actors participating in DF events.	• Work is needed to understand the end-to-end impact and understand the key roles in energy supply chain as well as the business models and business case for investment

Where to next?



Where can I learn more?

- Part A Report (EEA website)
- Asset Management Forum – 2nd November, Christchurch

Thank you


Ara Ake
Aurora Energy
ASSURITY
Buller
Cortexo
Everything Connected
Counties Energy
EA networks
connecting our community
EECA
Electra
Electricity Authority
Te Mana Hiko
EPECentre
evnex
genesis
HEG
Meridian
NEL
networktasman
Network Waitaki
Northpower
openloop
Orion
POWERCO
the lines
TOP ENERGY
TRANSPOWER
vector
WEL Networks
Westpower

Questions

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