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Electricity Engineers'
Association

Practicalities of FlexTalk

Demand Flexibility Common
Communication Protocols Project

EECA

Rodger Griffiths, Isabelle Le Quellec, Michael Richardson, Terry Paddy, Astad Kapadia & Rob Speirs

The background image shows a close-up of a person's hand inserting a charging cable into the open charging port of a dark-colored car. The car's body has a white perforated pattern. The scene is set against a dark background, possibly a garage or charging station.

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FlexTalk Project Recap

Rodger Griffiths (Industry Design Chair)

EECA

PROJECT RECAP

OpenADR Concepts

The trial will test OpenADR 2.0 communication protocol to achieve communication between the EDB and Flexibility Supplier.

Event Trigger Signal

These are the signals that are communicated via OpenADR from the EDB to the Flexibility Supplier. The event details will also contain event information such as start time, date and Trigger Duration.

Event Response Signal

OpenADR 2.0 allows an acknowledgement to go back to the VTN.

Event Reporting

Post event reporting will provide details of what was achieved during an event.

Programme

The Demand Flexibility programmes that the Flexibility Suppliers are enrolled in. All programmes are supported by a contract agreed in advance from EDB and Flexibility Supplier.

OpenADR 2.0 communication flow



The background of the slide features a photograph of a person's hand inserting a charging cable into the charging port of a dark-colored car. The car's charging port cover is open, and a yellow charging cable is visible. The scene is set in a well-lit environment, possibly a parking garage or a charging station. The image is partially obscured by a large blue diagonal graphic element that runs across the middle of the slide.

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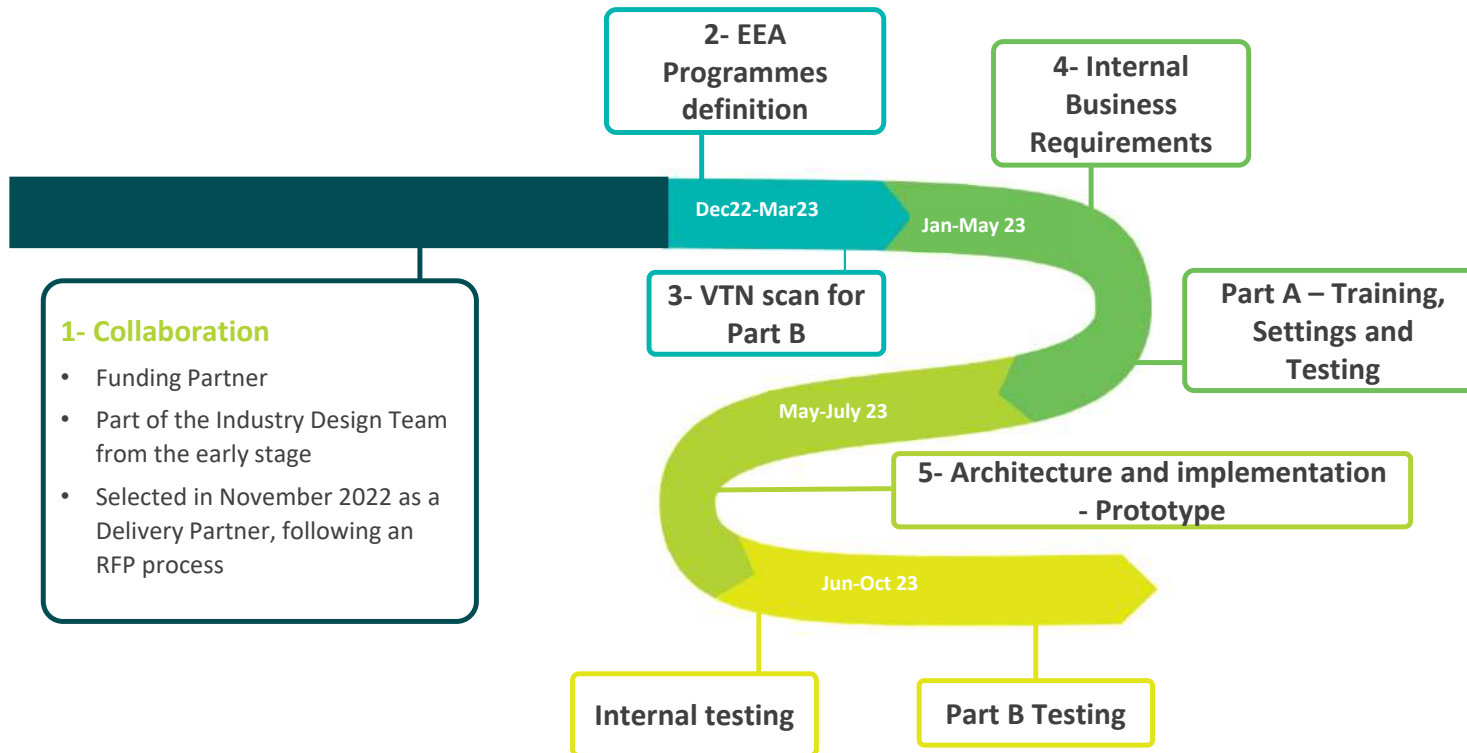
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EDB Perspective

Orion

EECA

OUR JOURNEY SO FAR



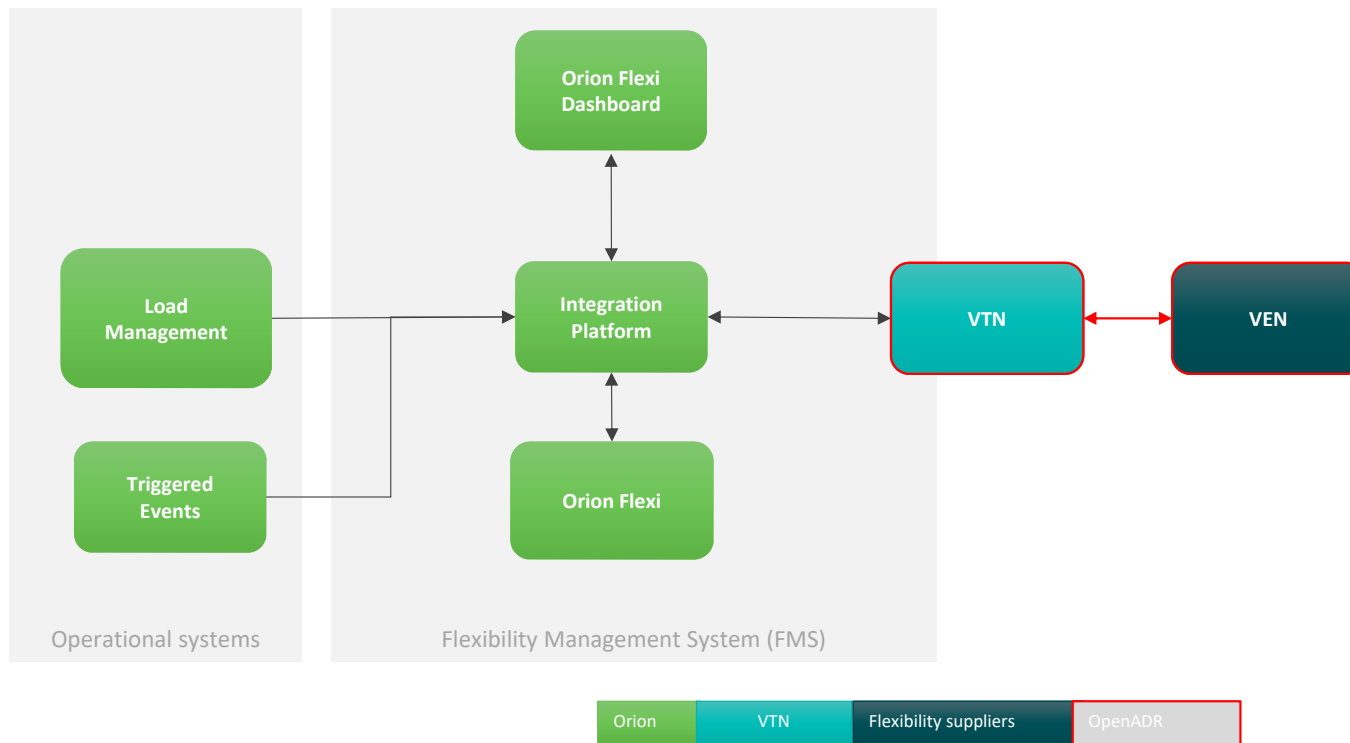
MAIN LEARNINGS

SO FAR...

1. **Collaboration** - Learn by doing with partners
2. **EEA Programmes definition** - Define a common set of flexibility programmes and terminology
3. **VTN scan for Part B** - Develop knowledge on current status of FMS/DRMS tools and communication options between EDB and Flexibility suppliers
4. **Internal Business Requirements** - Consider longer term business requirements
5. **Architecture and implementation - Prototype** - Evaluate the effort required between a non-operational trial and an operational solution

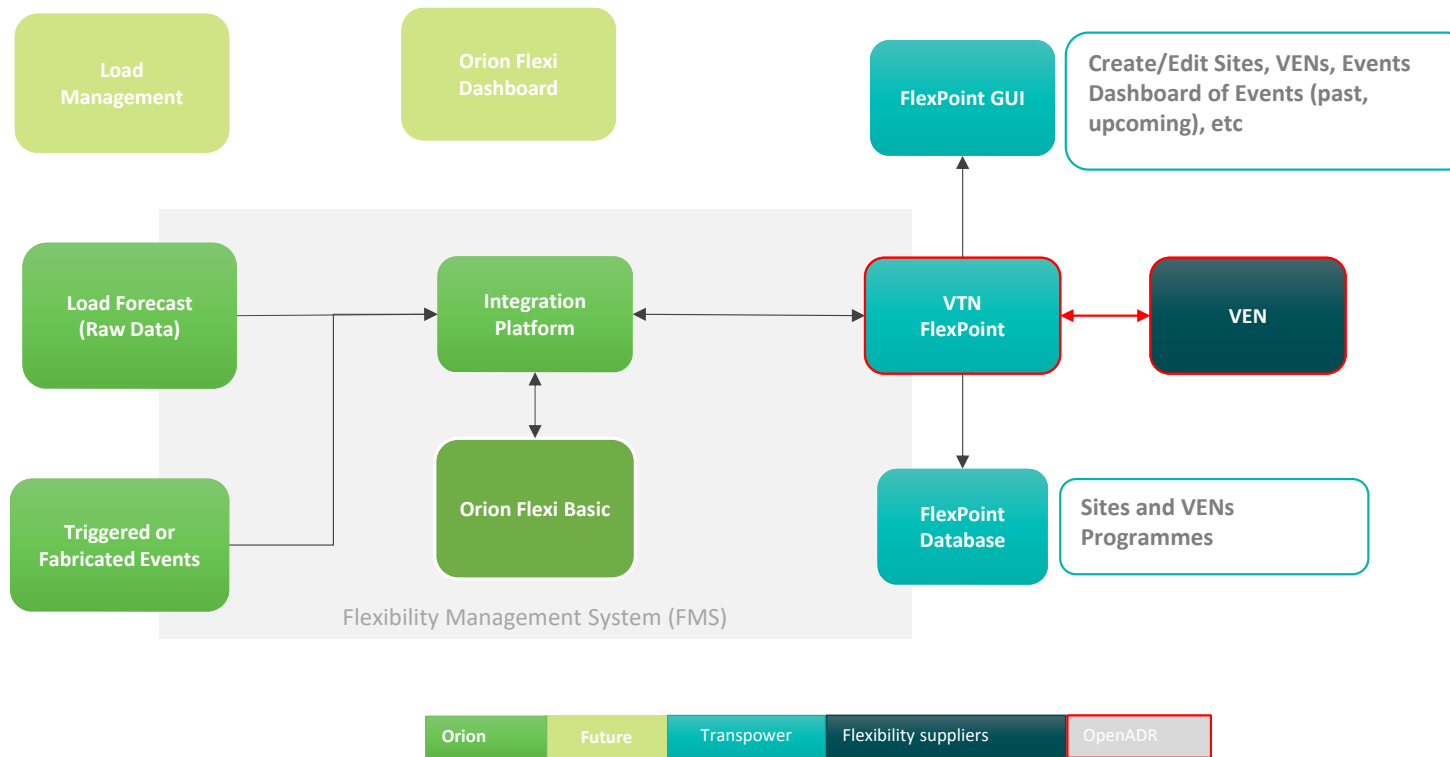


PROPOSED END SOLUTION

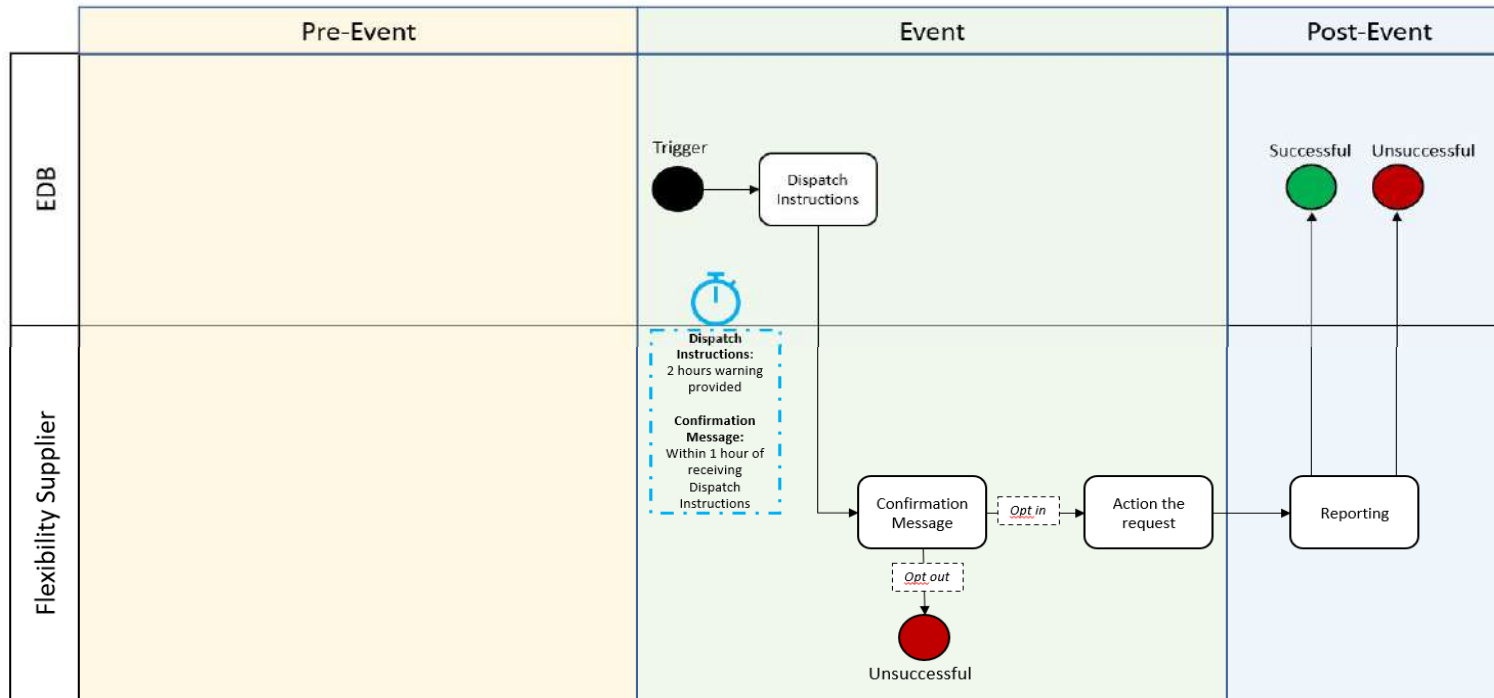


PROTOTYPE

MINIMUM VIABLE PRODUCT



DYNAMIC SHORT TERM NON-PRICE RESPONSIVE



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A photograph showing a person's hand plugging a charging cable into the charging port of an electric vehicle. The car is dark-colored, and the charging port is open. A yellow charging cable is visible. The background is slightly blurred, showing what appears to be a parking garage or a similar indoor setting.

Technical Perspective

Transpower

EECA

FLEXPPOINT OPERATOR DASHBOARD

ORION EXAMPLE



CREATING A TARGETED FLEX EVENT

ORION EXAMPLE CONT...



CREATING A TARGETED FLEX EVENT

ORION EXAMPLE CONT...

Event for Orion - Dynamic (Short-Term) Non-Price Responsive

Event Time: 27/08/23 16:00 to 27/08/23 17:00
Target Location: GAPS
Auto DR: Highest Level High
Event Parameters: Region: NZ, Target MW: 10, Min: 10

Select Registrations

1 selected

Organization	Registration	Fixed Price	Availability Fee	Proposed Hours	Target MW	Available Auto DR MW
Orion New Zealand	Orion New Zealand	\$1	\$	Hours	10	\$1

Buttons: SUBMIT, SAVE

CREATING A TARGETED FLEX EVENT

ORION EXAMPLE CONT...

app.drms.nz says
This will schedule the event. This action cannot be undone, are you sure you want to proceed?

OK Cancel

Event for Orion - Dynamic

From Jun 27th 21:45:00 (GMT) To Jun 28th 21:50:00 (GMT)

Event Time
Start: 27/06/23 16:00 End: 06/06/23 17:00 Auto Cancel: High Target: B Minimum Load Time: 30 Min

Target Location
Region: GRPS

Select Registrations

1 selected

Organization	Registrations	Fixed Price	Availability Fee	Preparation Hours	Target MW	Available Auto DR MW	Total Cost: \$0
Orion New Zealand	Cartono Open Loop Site - ISL0661 - Region A - Christchurch Dynamic (short-term) Non Price Responsive	\$1	\$	Hours	B	B	

Rows per page: 10 11 of 1

SCHEDULE SAVE

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Technical Perspective

Cortexo

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OpenADR 2.0 communication flow



openADR EVENT MESSAGE (eiEvent)

```
• <oadr:oadrSignedObject>
• <oadr:oadrDistributeEvent ei:schemaVersion="2.0b">
• <ei:eiResponse>
• <ei:responseCode>200</ei:responseCode>
• <ei:responseDescription/>
• <pyld:requestID>f50be8d1-a278-4595-a3b6-8fb2519f4917</pyld:requestID>
• </ei:eiResponse>
• <pyld:requestID>a248b0e9-0b6d-46a7-8242-4d5cda71301b</pyld:requestID>
• <ei:vtinID>production.drms.nz</ei:vtinID>
• <oadr:oadrEvent>
• <ei:eiEvent>
• <ei:eventDescriptor>
• <ei:eventID>ee43be4c-8be0-418f-8fd5-57c9856cf50e</ei:eventID>
• <ei:modificationNumber>0</ei:modificationNumber>
• <ei:priority>0</ei:priority>
• <ei:eiMarketContext>
• <emix:marketContext>
• https://openadr.flexibility.nz/npr_immediate
• </emix:marketContext>
• </ei:eiMarketContext>
• <ei:createdDateTime>2023-04-26T22:28:30Z</ei:createdDateTime>
• <ei:eventStatus>far</ei:eventStatus>
• <ei:testEvent/>
• <ei:vtinComment/>
• </ei:eventDescriptor>
• <ei:eiActivePeriod>
• <xcal:properties>
• <xcal:dtstart>
• <xcal:date-time>2023-04-27T05:00:00Z</xcal:date-time>
• </xcal:dtstart>
• <xcal:duration>
• <xcal:duration>PT1H</xcal:duration>
• </xcal:duration>
• <ei:x-eiNotification>
• <xcal:duration>PT1440M</xcal:duration>
• </ei:x-eiNotification>
• </xcal:properties>
• <xcal:components/>
• </ei:eiActivePeriod>
• <ei:eiEventSignals>
• <ei:eiEventSignal>
• <strm:intervals>
• <ei:interval>
• <xcal:duration>
• <xcal:duration>PT1H</xcal:duration>
• </xcal:duration>
• <xcal:uid>
• <xcal:text>0</xcal:text>
• </xcal:uid>
• <ei:signalPayload>
• <ei:payloadFloat>
• <ei:value>2.0</ei:value>
• </ei:payloadFloat>
• </ei:signalPayload>
• </ei:interval>
• </strm:intervals>
• <ei:signalName>SIMPLE</ei:signalName>
• <ei:signalType>level</ei:signalType>
• <ei:signalID>0d073dec-1520-4610-9420-405745b9da0</ei:signalID>
• </ei:eiEventSignal>
• </ei:eiEventSignals>
• <ei:eiTarget/>
• </ei:eiEvent>
• <oadr:oadrResponseRequired>always</oadr:oadrResponseRequired>
• </oadr:oadrEvent>
• </oadr:oadrDistributeEvent>
• </oadr:oadrSignedObject>
```

- VEN
- Connections
- Events
- Resource Schedules
- XML Logs

Events

VIEW UPCOMING **VIEW COMPLETED** VIEW ALL

REFRESH TABLE

START	DURATION	STATUS	VEN NAME	VTN EVENT ID	TYPE	PRIORITY	RESPONSE	DETAILS
16/06/2023 17:30	30 min	Far	Cortexo EVNEX - CML0331 - TXID (UW101)	8de83128-d1a9-4721-a30a-0aa7ad7e8a45	Test	Dispatch	Opted In	→
16/06/2023 17:30	30 min	Far	Cortexo EVNEX - CML0331 - TXID (UH106)	960a6881-aed8-4624-acac-27edbf44bd95	Test	Dispatch	Opted In	→
16/06/2023 17:30	30 min	Far	Cortexo EVNEX - CML0331 - TXID (UH91)	a3eedbe3-a9b7-4eef-b826-f99a625e7091	Test	Dispatch	Opted In	→
16/06/2023 12:30	30 min	Far	Evnex VEN - GXP ISL0661	2931f52a-1d32-4913-aa22-3b0b2bbe83f8	Test	Dispatch	Opted In	→
16/06/2023 12:30	30 min	Far	Evnex VEN - GXP KBY0661	51e386c8-6f40-49b3-98ed-7a98581a3849	Test	Dispatch	Opted In	→

OpenADR

terrypaddy@gmail.com
Cortexo

- VEN
- Connections
- Events
- Resource Schedules
- XML Logs

< BACK

Cortexo EVNEX - CML0331 - TXID (UH106)

VEN EVENT ID: 21
VTN EVENT ID: 960a6881-aed8-4624-acac-27edbf44bd95

THIS IS A TEST EVENT

STATUS
Far

TIME
30m
16 Jun 2023, 5:30pm to 6:00pm

Event Participation

OPT OUT **OPT IN**

Opted in at 11:36AM on 16 Jun 2023

CONTEXT
NPR-immediate

PRIORITY
Dispatch

Signal 21

START	END	DURATION	PAYLOAD
16/06/2023 17:30	16/06/2023 18:00	30 min	3

Programme	Baseline		Level 0	Level 1*	Level 2*	Level 3
Programme 01. In Advance Non-Price Responsive	Flex Capacity a.m	Flex capacity p.m	0%	50%	75%	100%
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%
Programme 04. Price Responsive Offers	Flex Capacity a.m	Flex capacity p.m	0%	50%	75%	100%
Programme 05. Price Responsive Discovery	N/A			N/A	N/A	N/A
Programme 06. Dynamic Operating Envelopes	N/A			N/A	N/A	N/A

JSON Message to Flex Suppliers

```
"specversion": "1.0",
"type": "com.cortexo.openadr.event.v1",
"source": "https://cortexo.com/openadr-programmes",
"id": "<generated UUID>",
"time": "2018-04-05T17:31:00Z",
"datacontenttype": "application/json",
"data": {
  "ven_id": "<ven UUID>",
  "ven_name": "<ven name>",
  "status": "near", // or far, active or cancelled
  "event_id": "event UUID",
  "modification_number": 0,
  "request_id": "<generated UUID>", // UUID of this message
  "priority": 1,
  "priority_description": "notification", // or dispatch
  "market_context": "https://openadr.flexibility.nz/emergency",
  "created_timestamp": "2023-03-16T21:00:40Z",
  "updated_timestamp": "2023-03-16T21:00:40Z", // changes on every update
  "flex_targets": "some resource id",
```

```
• "signals": [
• {
•   "id": 1,
•   "name": "simple",
•   "type": "level",
•   "intervals": [
•     {
•       "id": 1,
•       "timestamp_start": "2023-03-16T21:00:00Z",
•       "timestamp_end": "2023-03-16T23:00:00Z",
•       "duration": 120, // minutes
•       "payload": 3,
•       "payload_description": "80% of available flexibility"
•     },
•     {
•       "id": 2,
•       "timestamp_start": "2023-03-16T23:00:00Z",
•       "timestamp_end": "2023-03-17T00:00:00Z",
•       "duration": 60, // minutes
•       "payload": 2,
•       "payload_description": "100% of available flexibility"
•     }
•   ]
• }
• ]
```

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A photograph showing a person's hand plugging a charging cable into the charging port of a dark-colored electric vehicle. The charging station is mounted on a wall, and the car's charging door is open. The background is slightly blurred, showing what appears to be a parking garage or charging station area.

Flexibility Supplier Perspective

OpenLoop

EECA

CUSTOMER INSIGHTS

CUSTOMER ENROLMENT & COMMUNICATIONS

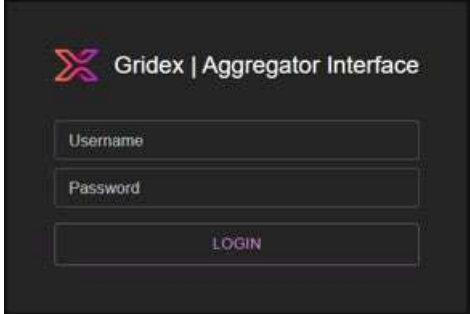
Complexities of choosing & enrolling customers

Customer Incentive perception

Mapping tables between EV Chargers to EDB assets

Clear and Precise Customer Comms throughout trial

Zero disruption to Customer operations

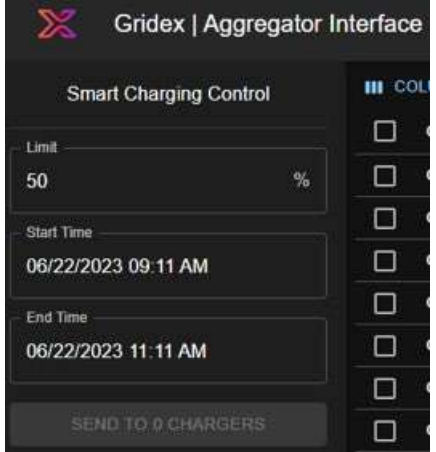


Gridex | Aggregator Interface

Username

Password

LOGIN



Gridex | Aggregator Interface

Smart Charging Control

Limit 50 %

Start Time 06/22/2023 09:11 AM

End Time 06/22/2023 11:11 AM

SEND TO 0 CHARGERS



INITIAL CHALLENGES & PROCESSES

New Platforms & Integrations

Hardware challenges & Resourcing

Mapping out process for programmes

Charger	Provider	Address
<input type="checkbox"/> OPL	Aurora	RA, ALEXANDRA
<input type="checkbox"/> OPL	Aurora	RA, ALEXANDRA
<input type="checkbox"/> OPL	Aurora	PARKS, WANAKA
<input type="checkbox"/> OPL	Aurora	WANAKA
<input type="checkbox"/> OPL	Aurora	WANAKA
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	RS POINT, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	RS POINT, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
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<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN
<input type="checkbox"/> OPL	Aurora	WN, QUEENSTOWN



The background of the slide features a photograph of a person's hand inserting a charging cable into the open charging port of a dark-colored car. The car's body has a white perforated pattern on the side. The scene is set against a dark, blurred background, possibly an indoor parking garage.

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Flexibility Supplier Perspective

Evnex

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CUSTOMER INSIGHTS SELECTION & ENROLMENT

Customer profile – residential consumer who is active

Response to enrolment

Evnex consumer T&C's – rights Vs social license



CUSTOMER INSIGHTS

POTENTIAL CUSTOMER IMPACTS

Financial impacts – TOU retail tariffs & solar generation

Experience impacts


“Charge Now” opt-out feature



CHALLENGES


No major technical challenges, just timing


Definition and interpretations across project participants e.g.




7.4kW

32 amps
50% means?

- 

1. 32 A, therefore 16 A?
- 

2. 20 A, so 10 A or 16 A?
- 

3. 0 A, so 0 A or 16 A?

Trial Delivery:

Part B – 2-way communication.

Trialling a variety of demand flexibility programmes to better understand the practical opportunities and constraints involved with using the OpenADR communication protocol

- ✓ More complex messaging (actual load kW)
- ✓ Reporting

Industry Engagement:

Engagement with key projects / bringing international learnings to project

Regular updates / sharing learnings on trial - Scan our QR Code!



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QUESTIONS?

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