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Electricity Engineers'
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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 plugging a charging cable into the charging port of an electric vehicle. The car is dark-colored, and the charging port is open, revealing the internal components. The person is wearing a dark jacket. The image is partially obscured by a blue diagonal graphic element.

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FlexTalk Project Recap

Rodger Griffiths (Industry Design Chair)

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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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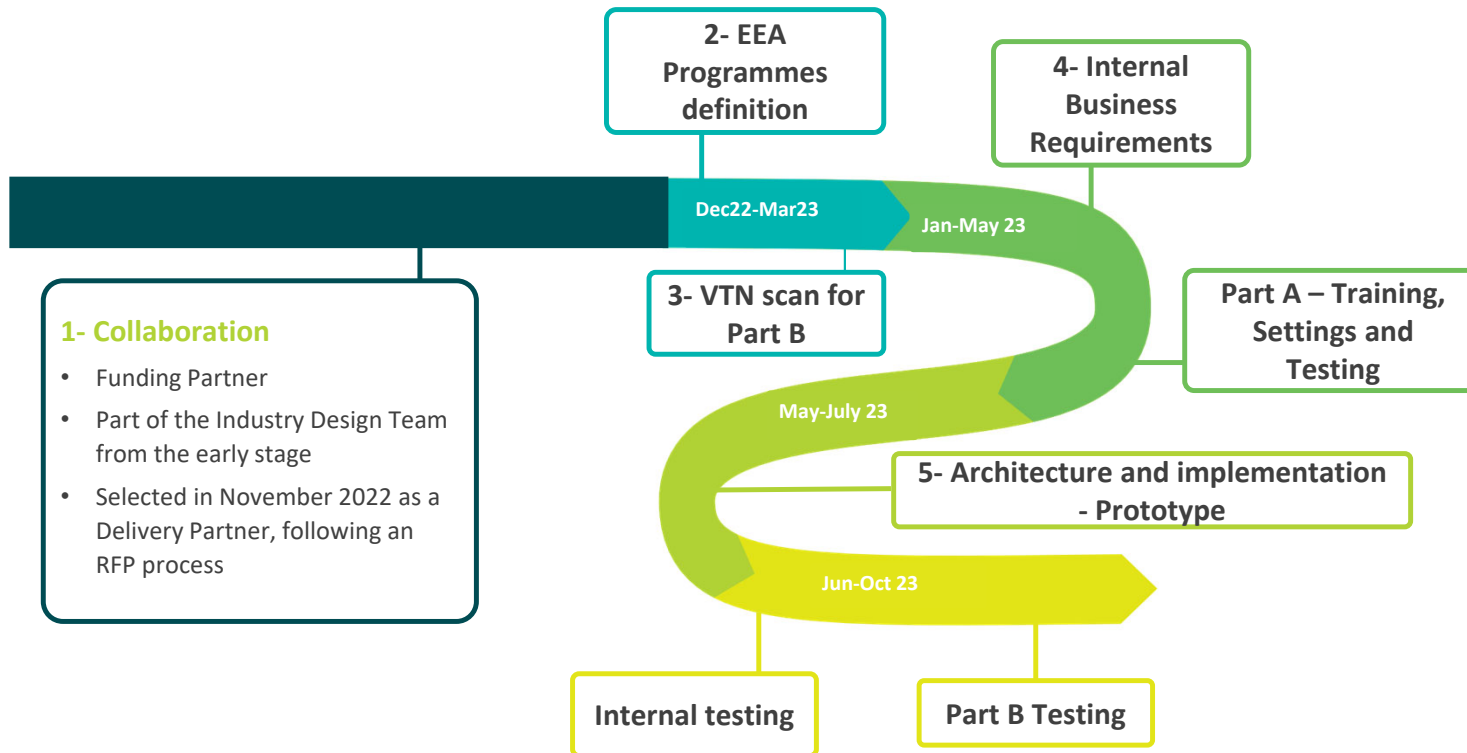
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EDB Perspective

Orion

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OUR JOURNEY SO FAR



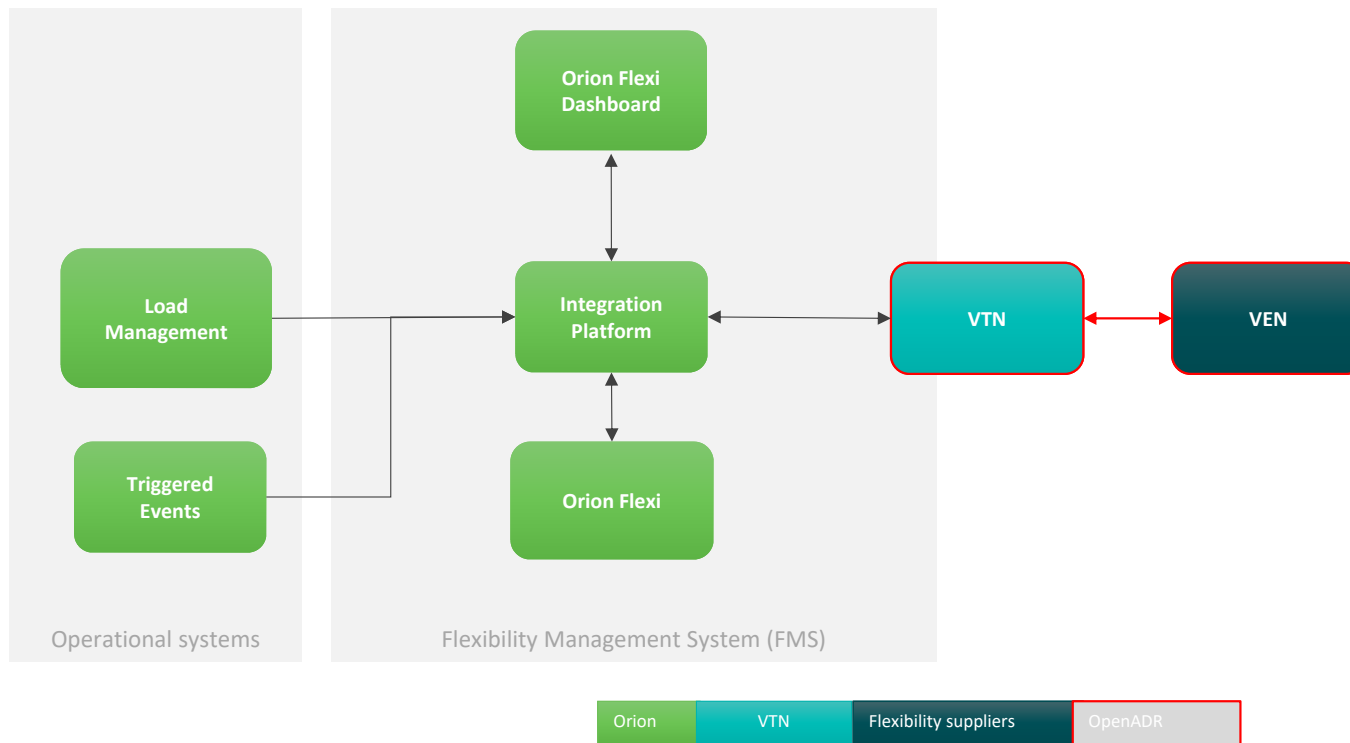
MAIN LEARNINGS

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

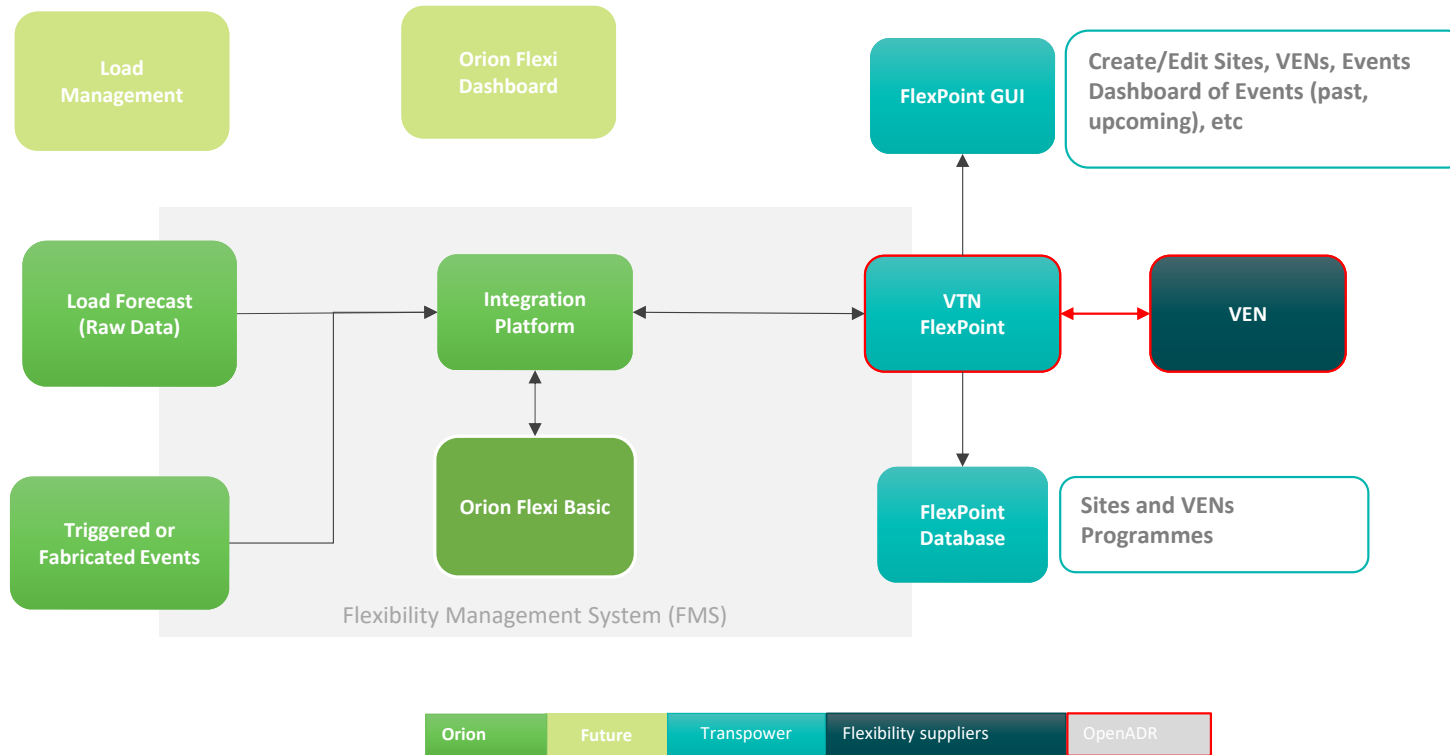


PROPOSED END SOLUTION

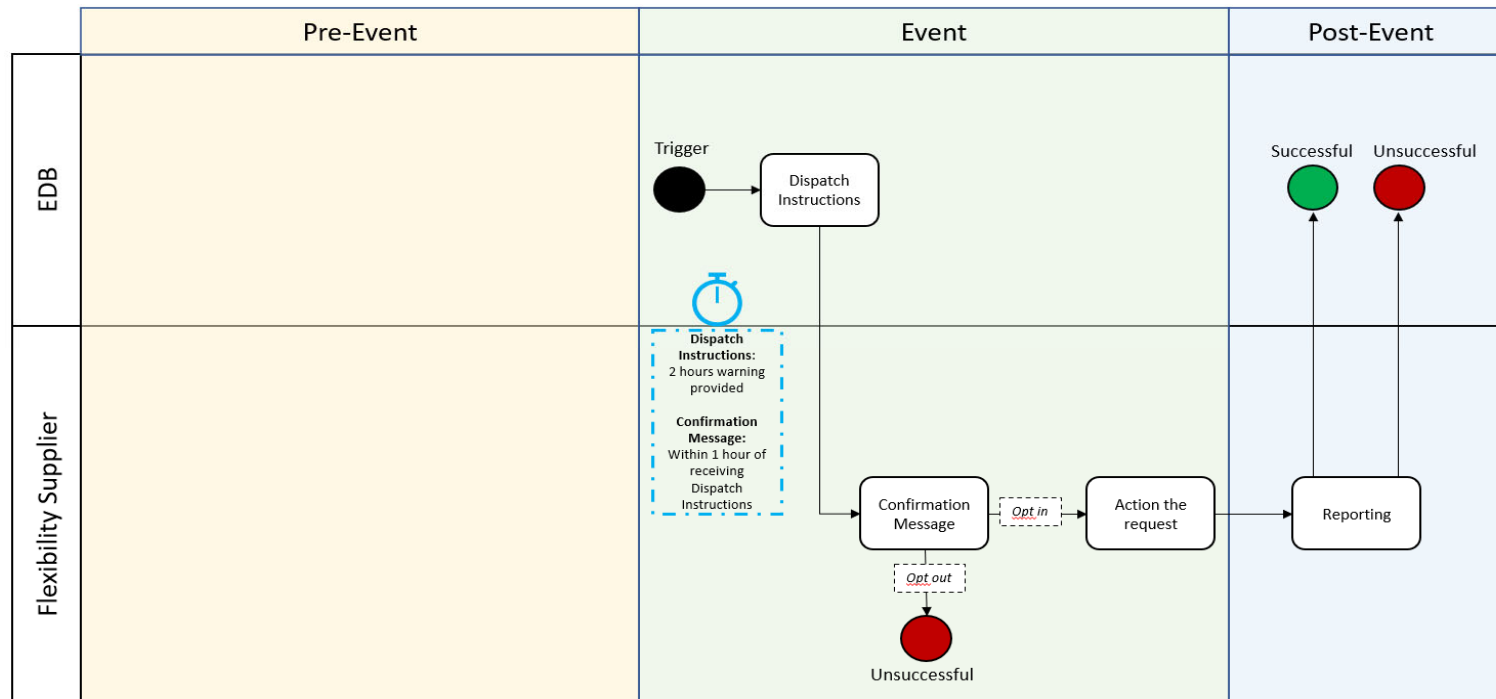


PROTOTYPE

MINIMUM VIABLE PRODUCT



DYNAMIC SHORT TERM NON-PRICE RESPONSIVE



The logo for the Electricity Engineers' Association (EECA), consisting of the lowercase letters 'eea' in a bold, white, sans-serif font.

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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. The background is slightly blurred, showing what appears to be a parking garage or a similar indoor setting.

Technical Perspective

Transpower

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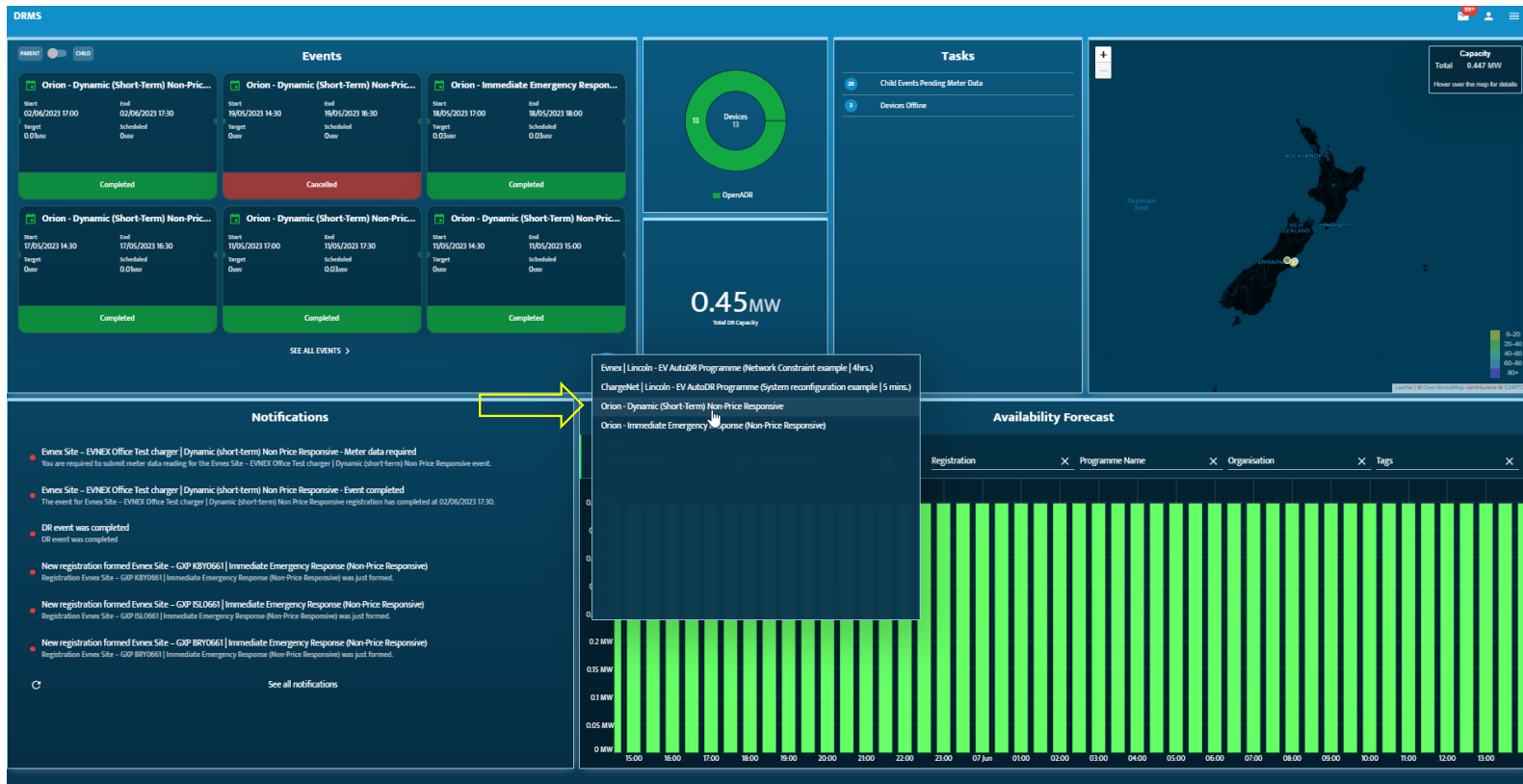
FLEXPOINT OPERATOR DASHBOARD

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

From Jun 27th 23, 4:00:00pm to Jun 27th 23, 5:00:00pm

Event Time
Start: 27/06/23 16:00 End: 27/06/23 17:00

Auto DR
Auto DR Level: High

Event Parameters
Target low: 13 MW 30 Min

Target Location
Region: GXP

Select Registrations

1 selected Selected MW: 0.01MW Auto DR: 0.01MW Total Cost: \$0.01

Organisation	Registration	Fixed Price	Availability Fee	Prepurchased Hours	Target MW	Available Auto DR MW
Orion New Zealand	Corteso OpenLoop Site - ISL0661 - Region A - Christchurch Dynamic (short-term) Non Price Responsive	\$1	\$	Hours	13	13

Buttons: SCHEDULE, 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 23, 4:00:00 pm To Jun 6th 23, 5:00:00 pm

Event Time
start 27/06/23 16:00 end 06/06/23 17:00 Auto DR Level High Target kW 13 Minimum Lead Time 30 Min

Target Location
Region GSPs

Select Registrations

1 selected Selected MW: 0.01MW Auto DR: 0.01MW Total Cost: \$0

Organisation	Registration	Fixed Price	Availability Fee	Pre-purchased Hours	Target kW	Available Auto DR kW
Orion New Zealand	Corteso OpenLoop Site - ISL0661 - Region A - Christchurch Dynamic (short-term) Non Price Responsive	\$1	\$	Hours	13	13

Rows per page: 10 1 of 1

SCHEDULE SAVE

A photograph showing a person's hand plugging a charging cable into the charging port of a car. The car is dark-colored, and the charging port is open. The background is blurred, showing what appears to be a parking lot or a charging station area. The image is partially obscured by a blue diagonal graphic element.

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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:vtnID>production.drms.nz</ei:vtnID>
• <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:vtnComment/>
• </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-27edb44bd95	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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Flexibility Supplier Perspective

OpenLoop

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CUSTOMER INSIGHTS

CUSTOMER ENROLMENT & COMMUNICATIONS

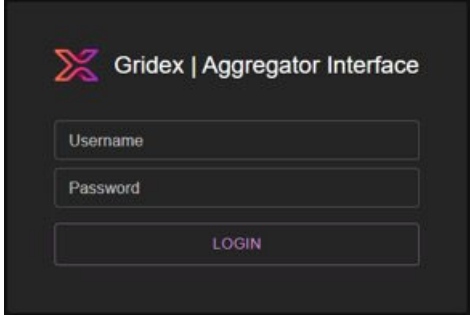
Complexities of choosing & enrolling customers

Customer Incentive perception

Mapping tables between EV Chargers to EDB assets

Clear and Precise Customer Comms throughout trial

Zero disruption to Customer operations

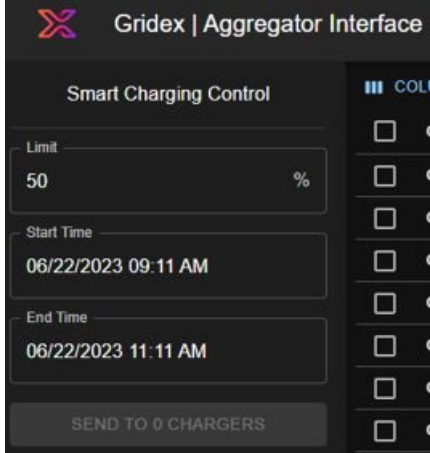


Gridex | Aggregator Interface

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
<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
<input type="checkbox"/> OPL-	Aurora	WN, QUEENSTOWN





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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




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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