Practicalities of FlexTalk

Demand Flexibility Common Communication Protocols Project

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FlexTalk Project Recap

Rodger Griffiths (Industry Design Chair)

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. he 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 be 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

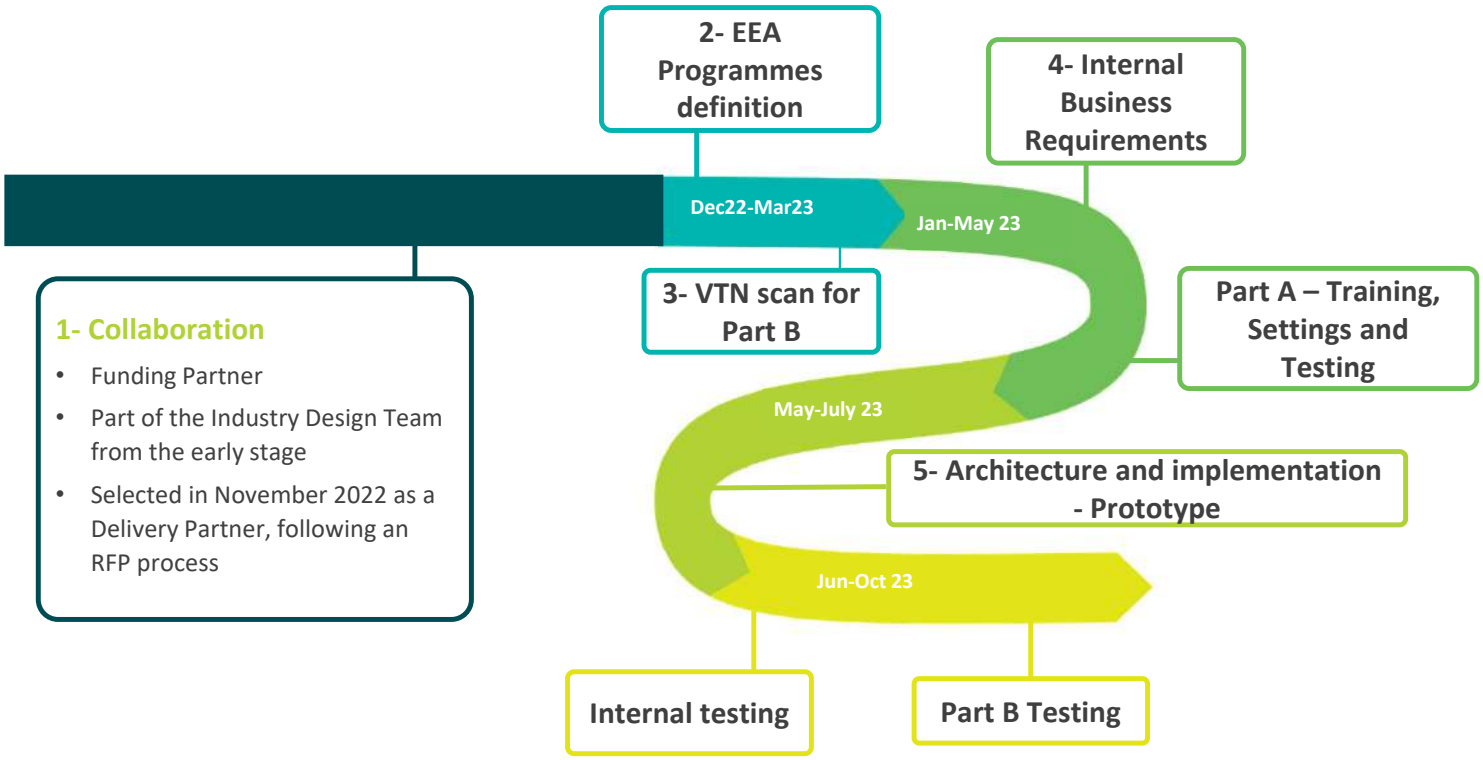
Electricity Engineers' Association

EDB Perspective

Orion

EECA

OUR JOURNEY SO FAR

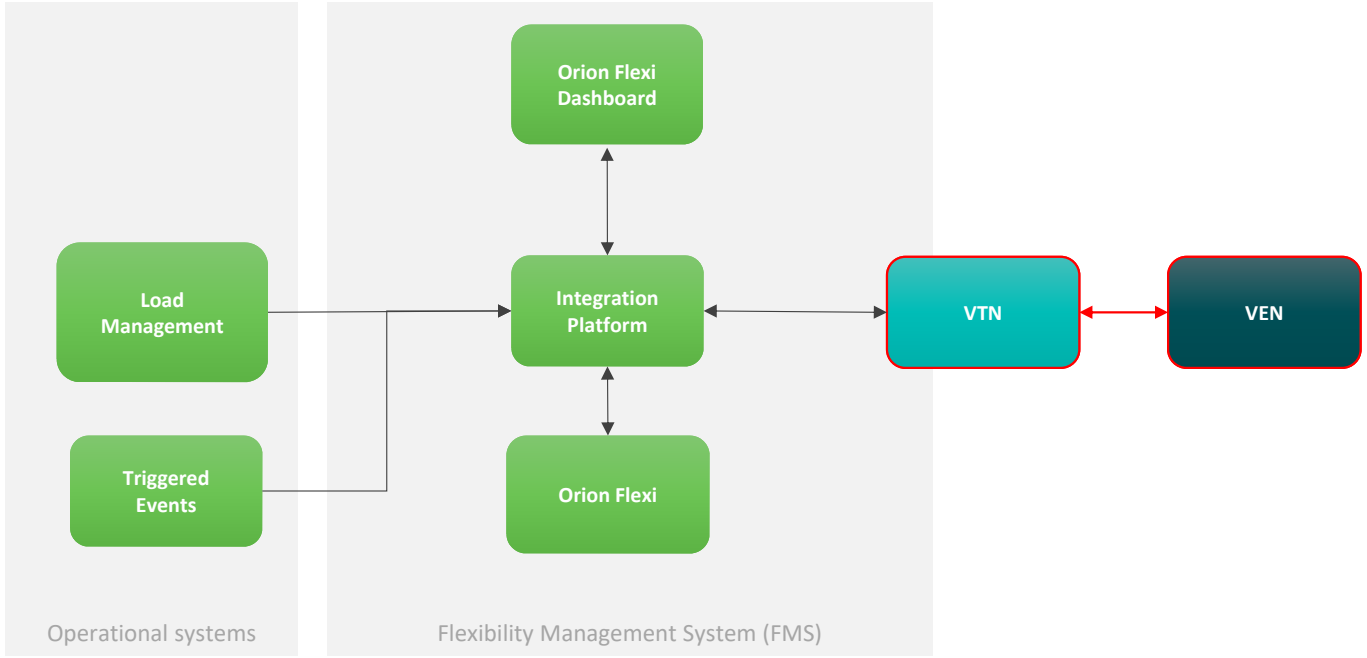


MAIN LEARNINGS

SO FAR…

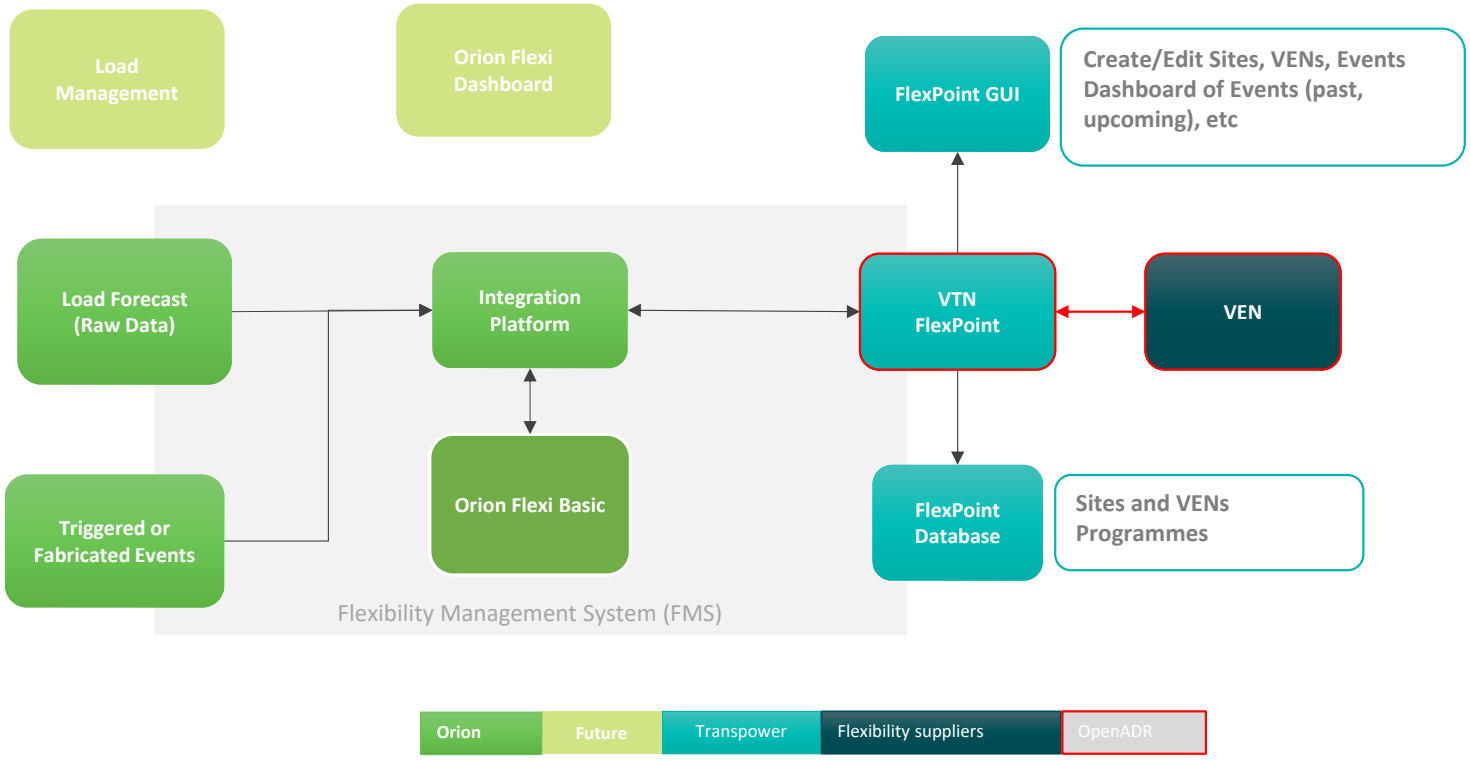
1. **Collaboration** - Learn by doing with partners
2. **EEA Programmes definition -** Define a common set of flexibility programmes and terminology
3. **VTN scan for Part B -** Develop knowledge on current status of FMS/DRMS tools and communication options between EDB and Flexibility suppliers
4. **Internal 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

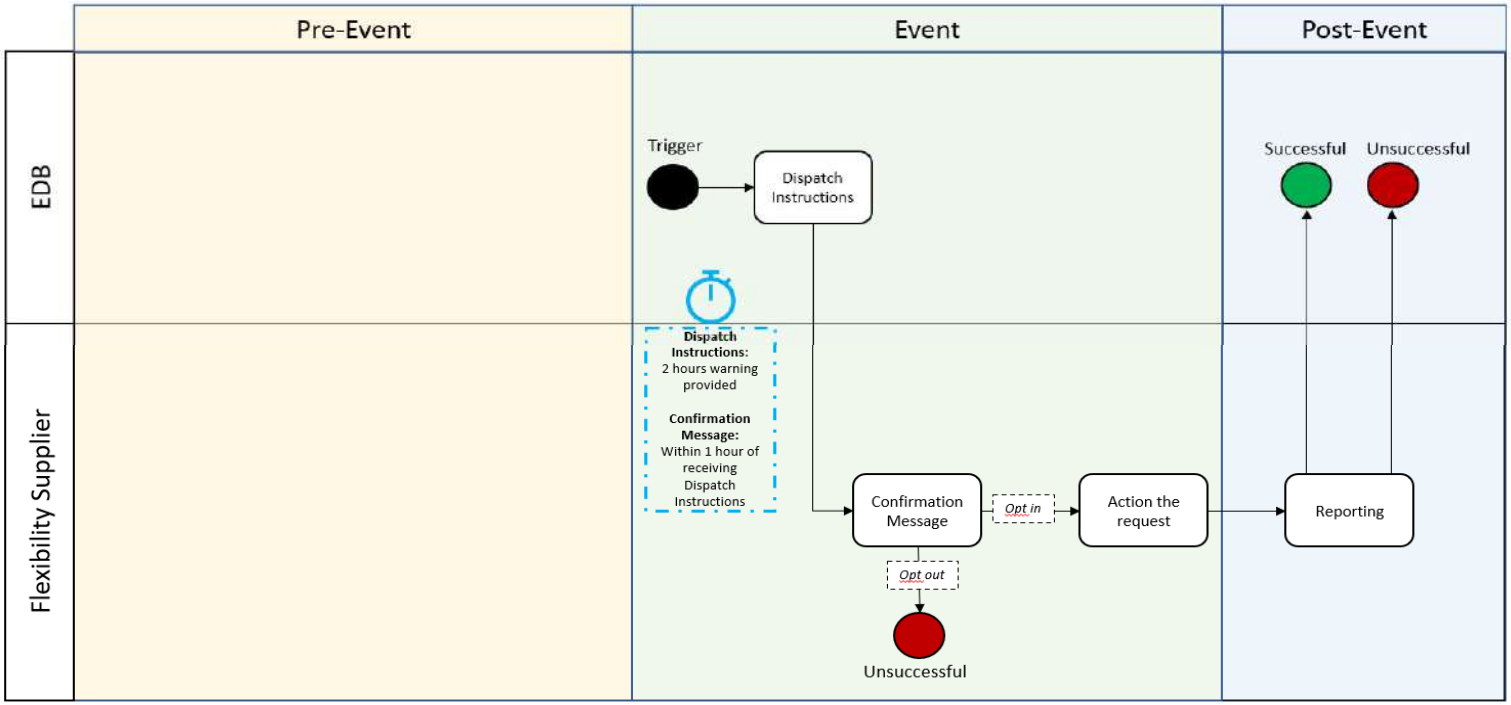


PROTOTYPE

MINIMUM VIABLE PRODUCT



DYNAMIC SHORT TERM NON-PRICE RESPONSIVE



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Technical Perspective

Transpower

EECA

FLEXPOINT OPERATOR DASHBOARD

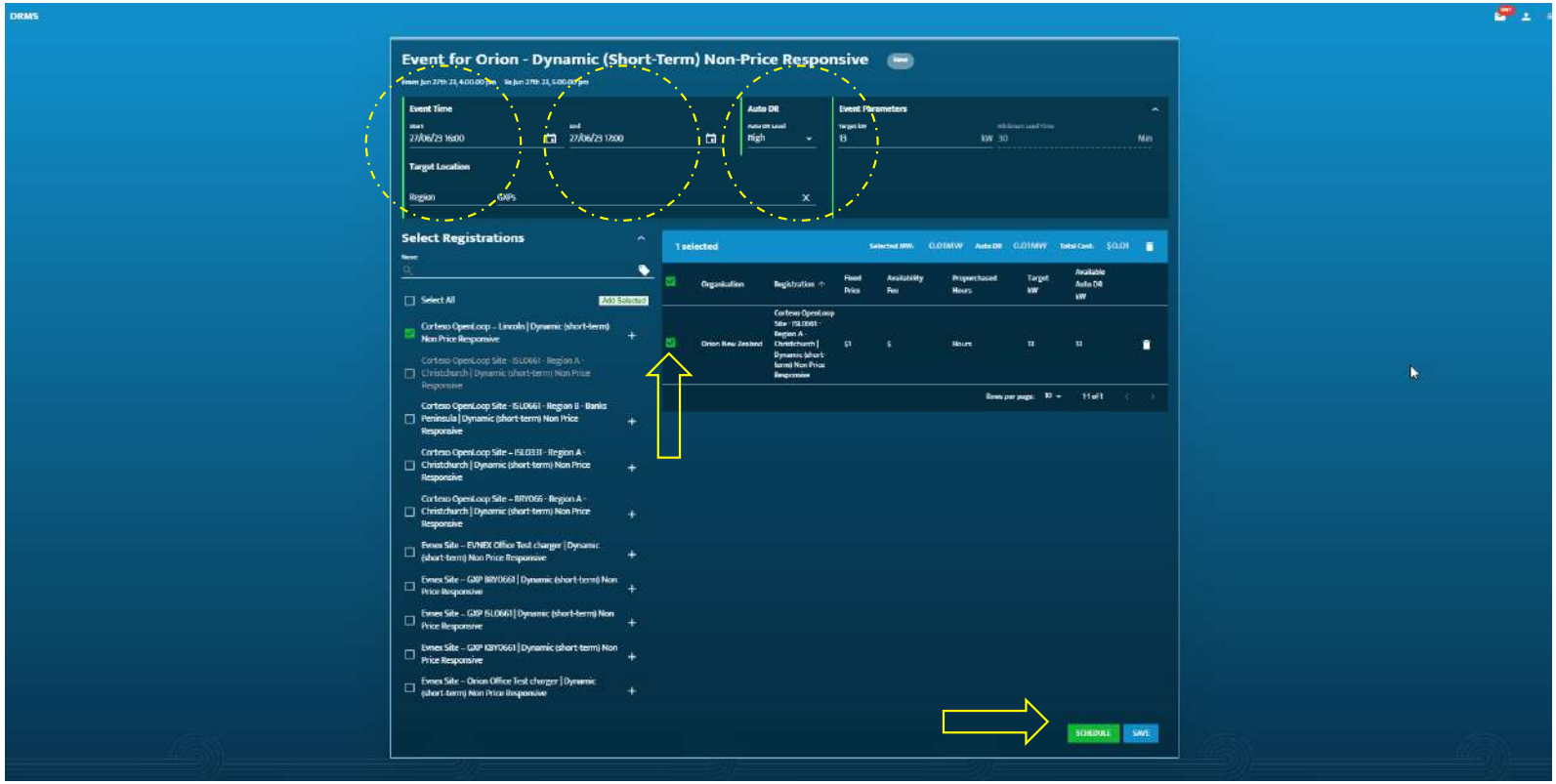
ORION EXAMPLE

CREATING A TARGETED FLEX EVENT

ORION EXAMPLE CONT...

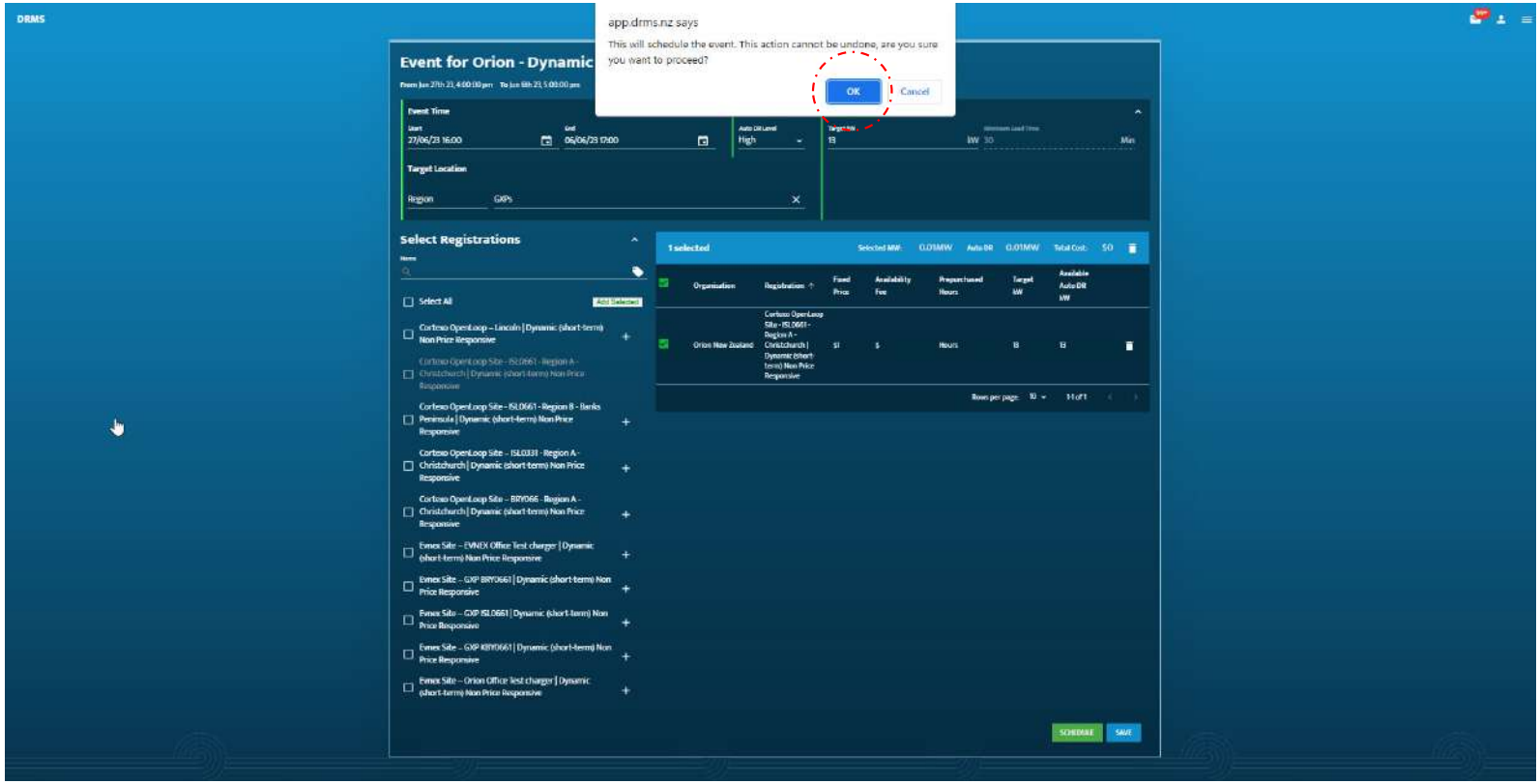
CREATING A TARGETED FLEX EVENT

ORION EXAMPLE CONT...



CREATING A TARGETED FLEX EVENT

ORION EXAMPLE CONT...



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Technical Perspective

Cortexo

EECA

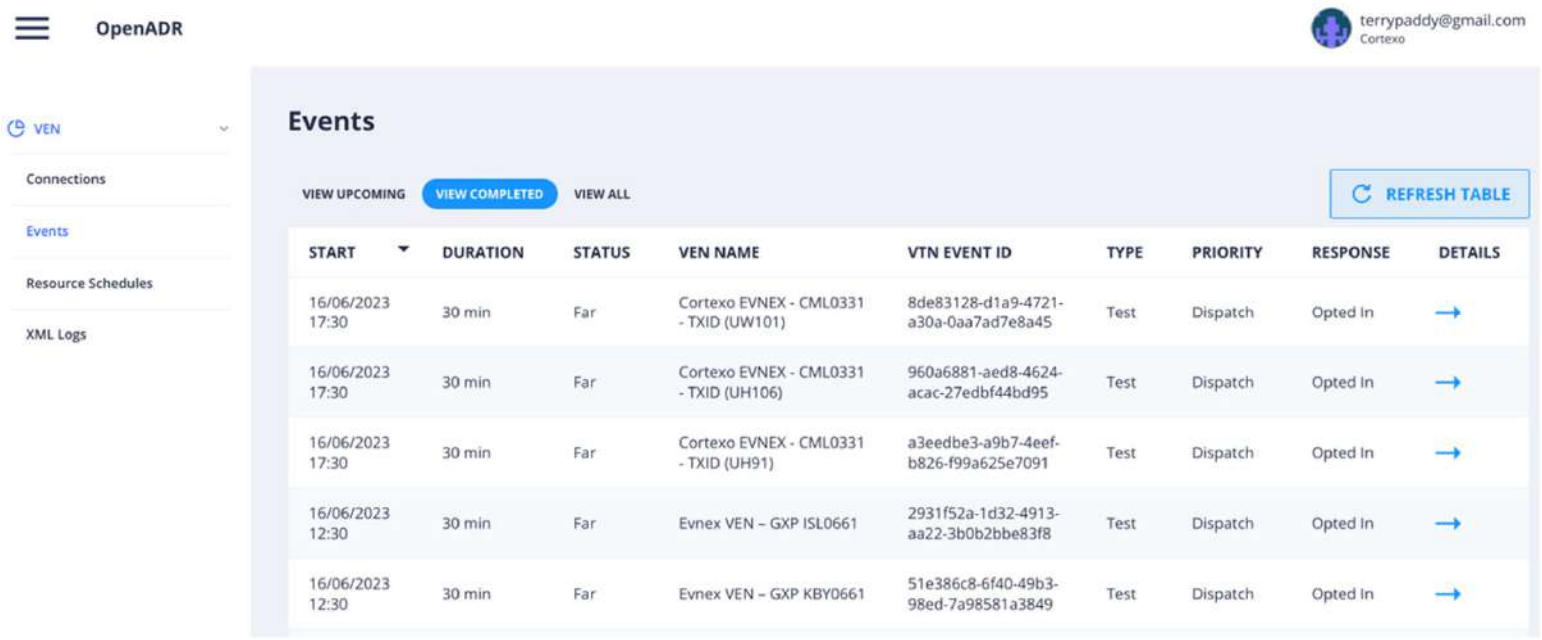
openADR FLEXTALK MESSAGES

OpenADR 2.0 communication flow

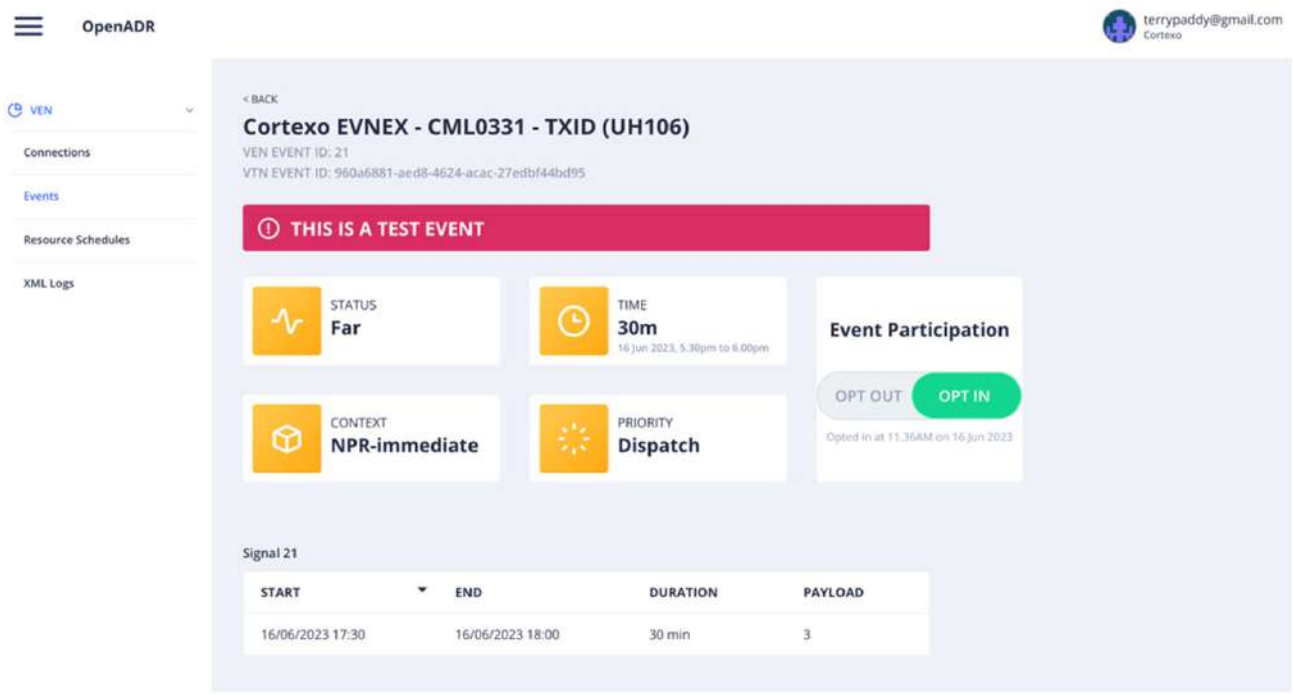
openADR EVENT MESSAGE (eiEvent)

```
<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>ddb73dec-f92d-4616-5420-4053743b5da0</ei:signalID>
          </ei:eiEventSignal>
        </ei:eiEventSignals>
        <ei:eiTarget/>
      </ei:eiEvent>
      <oadr:oadrResponseRequired>always</oadr:oadrResponseRequired>
    </oadr:oadrEvent>
  </oadr:oadrDistributeEvent>
</oadr:oadrSignedObject>
```

openADR VEN Events GUI



openADR VEN GUI Event Detail



openADR VEN

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

EECA

CUSTOMER INSIGHTS

CUSTOMER ENROLMENT & COMMUNICATIONS

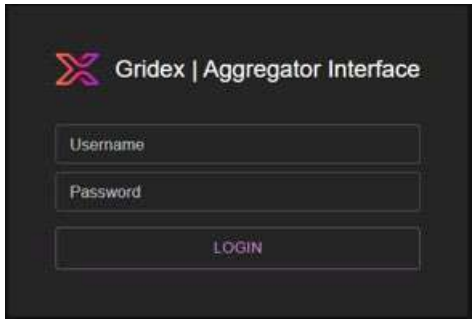
Complexities of choosing & enrolling customers

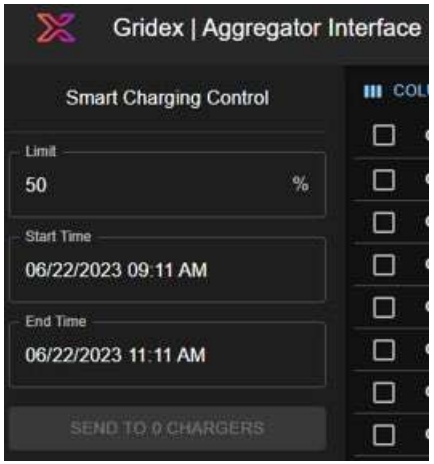
Customer Incentive perception

Mapping tables between EV Chargers to EDB assets

Clear and Precise Customer Comms throughout trial

Zero disruption to Customer operations





INITIAL CHALLENGES & PROCESSES

New Platforms & Integrations

Hardware challenges & Resourcing

Mapping out process for programmes

Charger	Provider	Address
OPL-	Aurora	RA, ALEXANDRA
OPL-	Aurora	RA, ALEXANDRA
OPL-	Aurora	PARKS, WANAKA
OPL-	Aurora	WANAKA
OPL-	Aurora	WANAKA
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	RS POINT, QUEENSTOWN
OPL-	Aurora	RS POINT, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN
OPL-	Aurora	WN, QUEENSTOWN

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Flexibility Supplier Perspective

Evnex

EECA

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?

NEXT STEPS

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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