

# NEM Reform - SCADA Lite Industry Consultation

General Workshop  
23<sup>rd</sup> August 2023



# 1. Welcome



We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

**We pay respect to their Elders past and present.**

# Agenda

| # | Time        | Topic   | Presenter(s)                    |
|---|-------------|---|---------------------------------|
| 1 | 10:00-10:05 | <b>Welcome</b>  | Luke Barlow                     |
| 2 | 10:05-10:20 | <b>Project Background</b> <ul style="list-style-type: none"><li>• Who is it for &amp; why is it needed?</li><li>• WDR Guidelines</li><li>• Power System Communication Standard</li><li>• What is the solution?</li></ul>  | Luke Barlow                     |
| 3 | 10:20-10:30 | <b>Important Milestones</b>   | Luke Barlow                     |
| 4 | 10:30-11:05 | <b>Business Perspective</b> <ul style="list-style-type: none"><li>• SCADA Lite eligibility</li><li>• User journey maps</li><li>• Cost recovery (Indicative)</li></ul>   | Luke Barlow                     |
| 5 | 11:05-11:40 | <b>Technical Perspective</b> <ul style="list-style-type: none"><li>• SCADA Lite high-level overview</li><li>• Power System Data Communication Standard</li><li>• General properties</li><li>• Use Case 1 conceptual solution</li><li>• Use Case 2 conceptual solution</li></ul> | Moses Chitima/Sunal Kumar Kohli |
| 6 | 11:40-12:00 | <b>Questions &amp; Answers</b>  | Open Session                    |

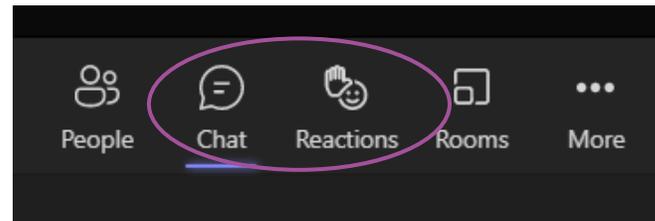
# Introductions

## Session purpose:

Inform stakeholders of the objectives and scope of SCADA Lite Initiative  
Seek industry perspectives on proposed technical solution and business impacts

## Ways of collaborating

To support discussion during this forum, we ask all attendees to please raise their virtual hand when they intend to speak or post questions in the Teams chat and be respectful to others speaking. There will be breaks to verbally answer questions throughout the presentation as well as at the end.



Please introduce yourself (name & organisation) before you speak.

# AEMO SCADA Lite Team



| <b>Name</b>       | <b>Role</b>                 |
|-------------------|-----------------------------|
| Luke Barlow       | Reform Owner                |
| Moses Chitima     | Business Owner              |
| Tim Saw           | Network Engineer            |
| Ivan Antic        | Network Architect           |
| Raj Singh         | Solution Architect          |
| Paul Johnson      | Stakeholder Engagement Lead |
| Sunal Kumar Kohli | Project Manager             |
| Jacob Mann        | Technical BA                |
| Miriam Issac      | Functional BA               |

## 2. Project Background



# Project Context - Who is the solution for?

The solution is for the below enlisted NEM Participants that are not able to exchange operational (telemetry and control) information with AEMO via an NSP (Network Service Provider):

- Demand Response Service Providers (DRSPs)
- VPPs (Virtual Power Plants)
- SGAs (Small Generation Aggregators)
- Operators of remote grid scale assets (e.g., solar and wind farms)

# Project Context - Why is it needed?

- The evolving and transitional NEM market will involve several new non-NSP (Network Service Provider) Participants in addition to the already existing traditional ones (such as NSPs and Generators).
- It has been onerous for these non-NSP Participants to establish a telemetry connection with AEMO using the ICCP (Inter-control Centre Communications Protocol) protocol that AEMO currently supports.
- SCADA Lite solution will deliver the requirements defined in both the [WDR Guidelines](#) (Version 1.0, Effective Date: 24 June 2021) and [Power System Data Communication Standard](#) (Version 3.0, Effective Date: 3 April 2023).
- New Reform initiatives such as [Integrating price-responsive resources into the NEM](#) will soon open new market opportunities for non-NSP Participants once accessible telemetry exchange channels are available.

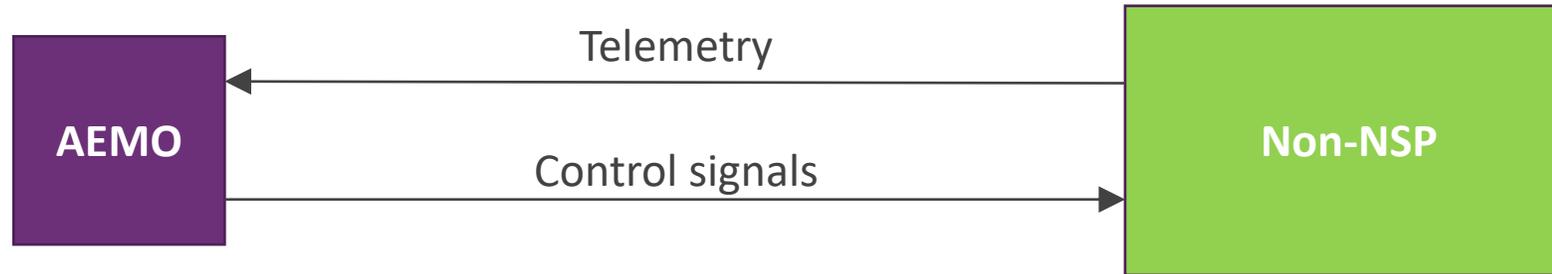
# Wholesale Demand Response (WDR) Guidelines

- The guidelines state that any WDR service provider looking to register a WDR unit greater than 5MW must provide telemetry
- The telemetry requirements are defined in the guidelines
- The guidelines can be found here: [WDR Guidelines](#)

# Power System Data Communication Standard v3.0

- Power System Data Communication Standard was re-issued in 2023 following a consultation process ([Final Report and Determination 24 November 2022](#))
- The consultation process received submissions from industry in ways the standard could support the future operational requirements of the NEM
- The review highlighted that the NER requires Participants of certain markets to have bi-directional data communications with AEMO, but that upstream NSPs are not always able to provide the services of a data Intervening Facility to enable the data transfer with AEMO.
- Key Outcomes:
  - Clarity on the obligations of an Intervening Facility to provide the services under certain conditions. This is expected to impact some NSPs with market-scheduled assets connected to their network.
  - AEMO will offer a direct communication option for situations where an NSP Intervening Facility is not viable
- All direct connections of non-NSPs (SCADA Lite) must meet the minimum obligations defined in The Power System Data Communication Standard v3.0

# Project Context - What is the solution?

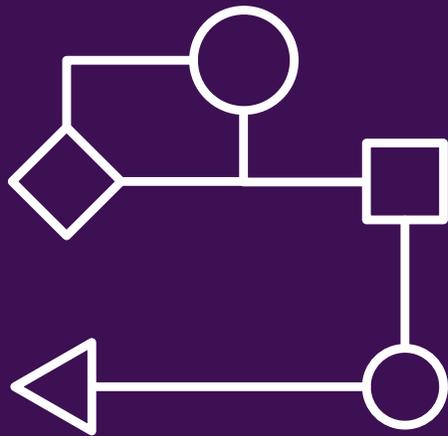


SCADA Lite will enable NEM non-NSP Participants to establish a bi-directional connection to exchange operational information (telemetry and control) with AEMO.

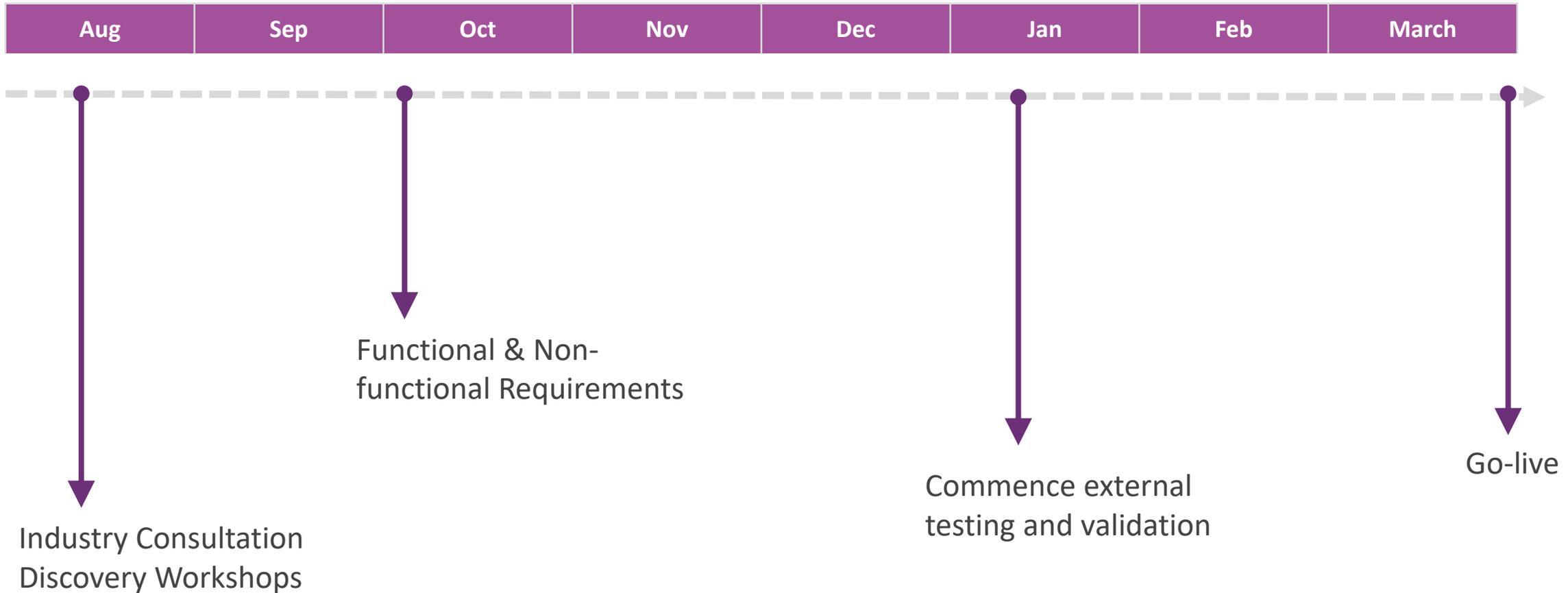
The solution will support both cloud-hosted (major Australian cloud providers) and physical infrastructure based non-NSP Participant Intervening Facilities (endpoints).

The protocols supported will be ICCP, as well as the Secure DNP3.0 protocol (agreed with the industry Participants through the [Power System Data Communication Standard Consultation](#) to establish this connection.

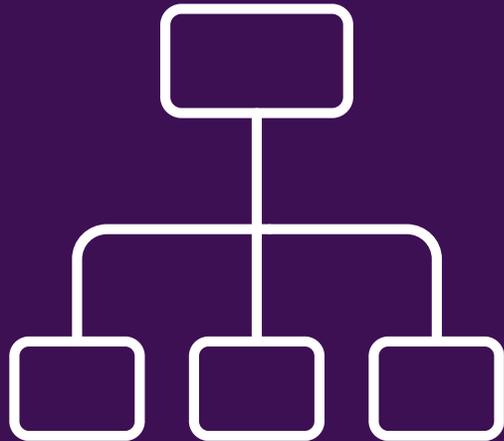
# 5. Implementation Milestones



# Implementation Roadmap



# 3. Business Perspective Overview

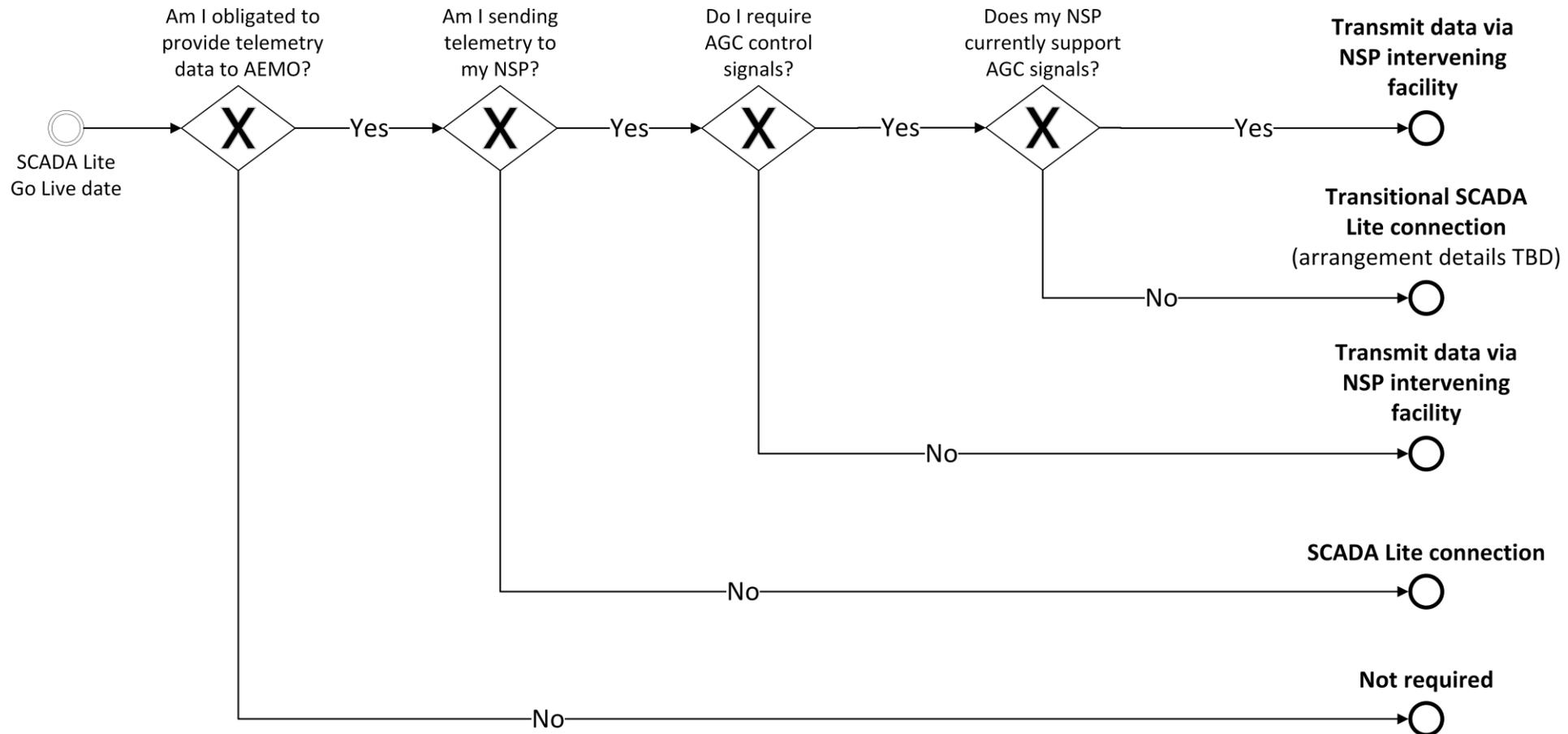


# Eligibility map

## SCADA Lite Decision Tree – Do I need a SCADA Lite Connection?

Decision points to determine if a SCADA Lite connection is required

Version 1.0



# SCADA Lite User Journey – Existing Registrations (NEM)

Request Submission

Application Review

SCADA Lite Connection

Periodic Invoice

## 1 Submit SCADA Lite request

- Contact Support Hub

## 2 Receive correspondence from AEMO

- Receive SCADA Lite connection invoice
- Any feedback to progress application

## 3 Respond to AEMO

- Make invoice payment
- Send necessary information to progress application

## 4 Design

- SCADA model
- Network model
- Communication architecture

## 5 Initiate SCADA Lite configuration

- Interact and review with AEMO *Network Services & Grid Systems* teams for the design and implementation plan

## 6 Implement and test SCADA Lite

- Configure SCADA points
- Verify test data

## 7 Cost recovery of periodic invoices

- Periodic invoices issued annually

# SCADA Lite User Journey – New Registrations (NEM)

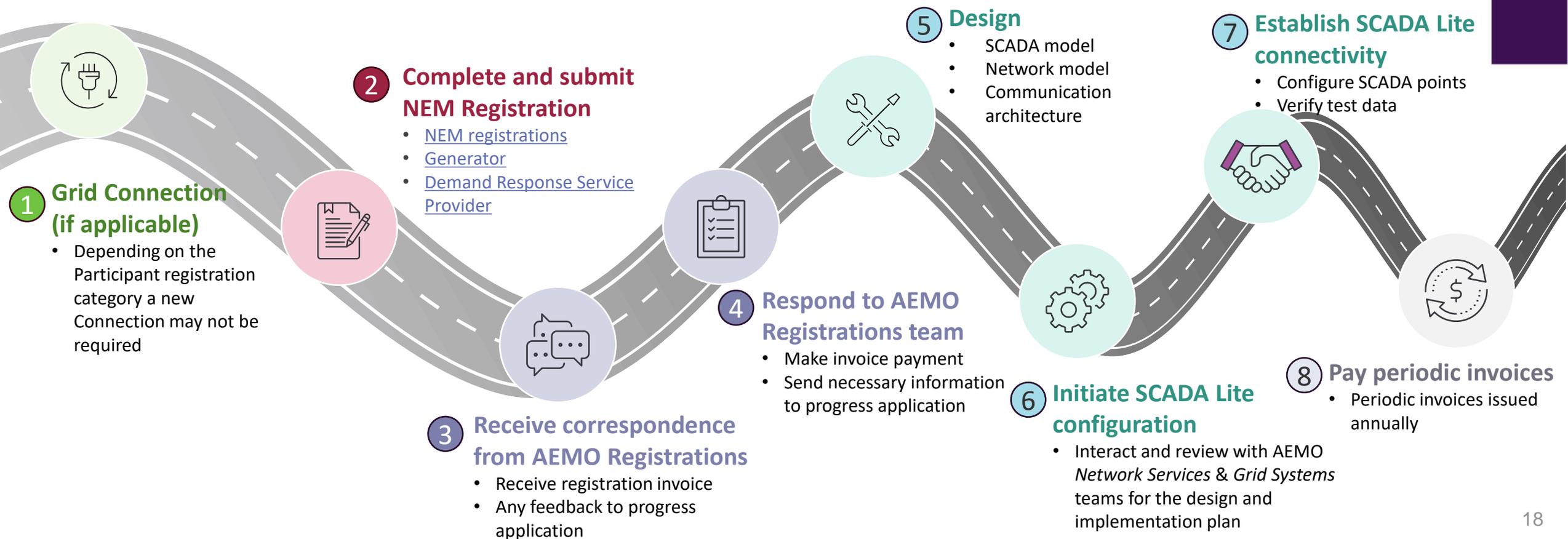
Connection

Application  
Submission

AEMO Registration  
Review

SCADA Lite Connection

Periodic Invoice

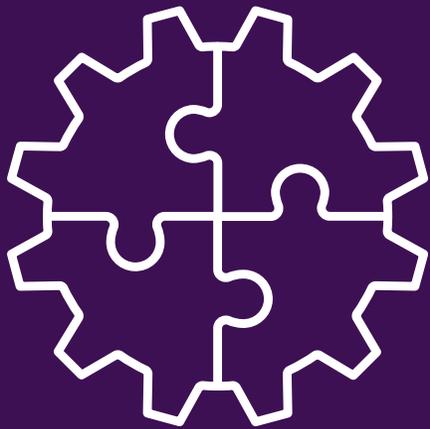


# Cost Recovery (Indicative)

- In line with other provided services, AEMO will be recovering service cost of a SCADA Lite connection through direct fees (in a manner similar to MarketNet)
- The fee will represent the direct cost to AEMO of procuring and maintaining the service
- First fee to be pro-rata for the remaining term of the current fiscal year

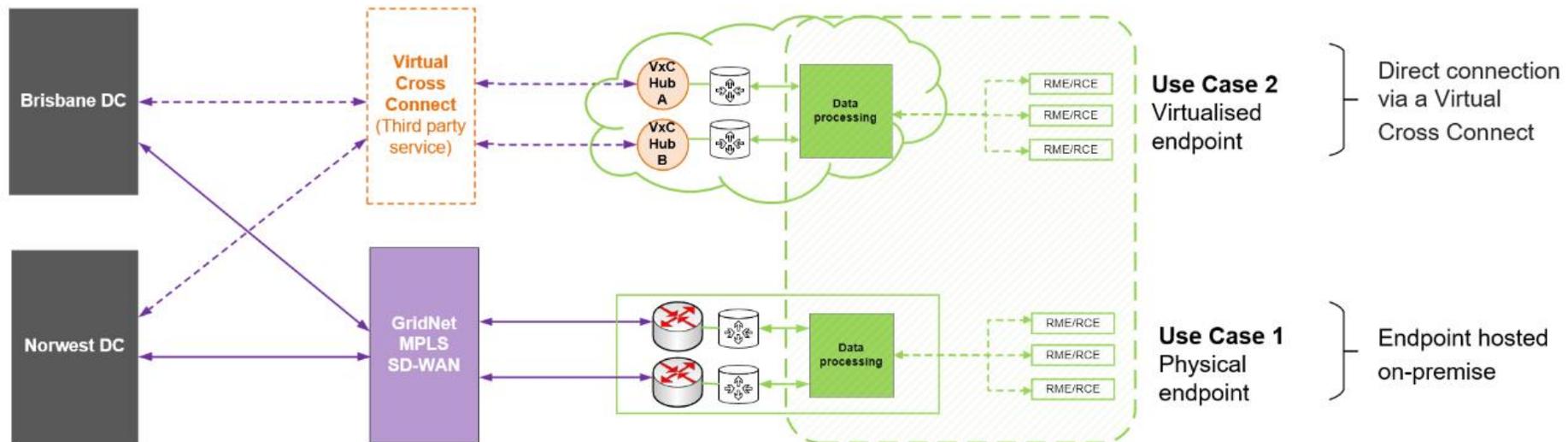
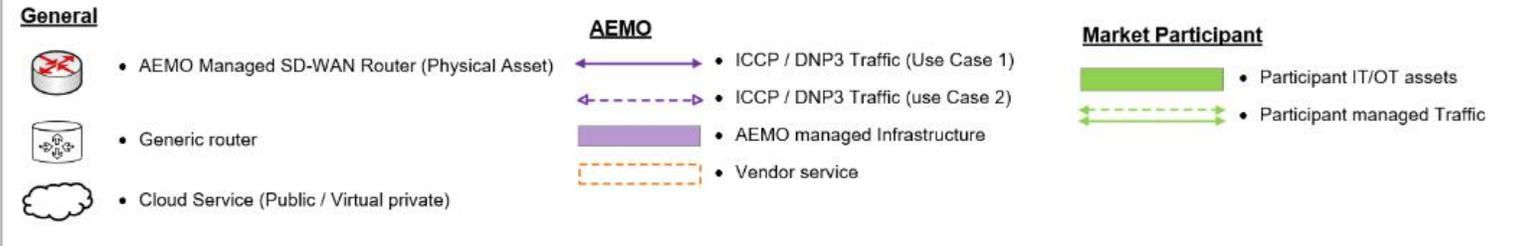
| Connection Type    | Connection technology | Service Cost   | Invoice period  | Key service components   |
|--------------------|-----------------------|--|---|--|
| Virtual End Point  | Virtual Cross Connect | \$25,000-\$30,000  | <ul style="list-style-type: none"> <li>• Annual (FY)</li> </ul> | <ul style="list-style-type: none"> <li>• Initial set up and configuration of network connection</li> <li>• Virtual Cross Connect services</li> <li>• Required port connections</li> <li>• Maintenance and upkeep of service</li> </ul> |
| Physical End point | GridNet SD-WAN        | <p><b>Hardware &amp; Support:</b> \$7,000 – \$10,000</p> <p><b>Comms link:</b> TBC</p> | <ul style="list-style-type: none"> <li>• Annual (FY)</li> </ul> | <ul style="list-style-type: none"> <li>• Supply of hardware</li> <li>• Initial set up and configuration of network connection</li> <li>• Maintenance and upkeep of service</li> </ul>  |

# 4. Technical Perspective Overview



# SCADA Lite high-level overview

## Legend



• Illustrative representation of communication links

• Illustrative representation of participant SCADA solution

# Power System Data Communication Standard v3.0 (The Standard)

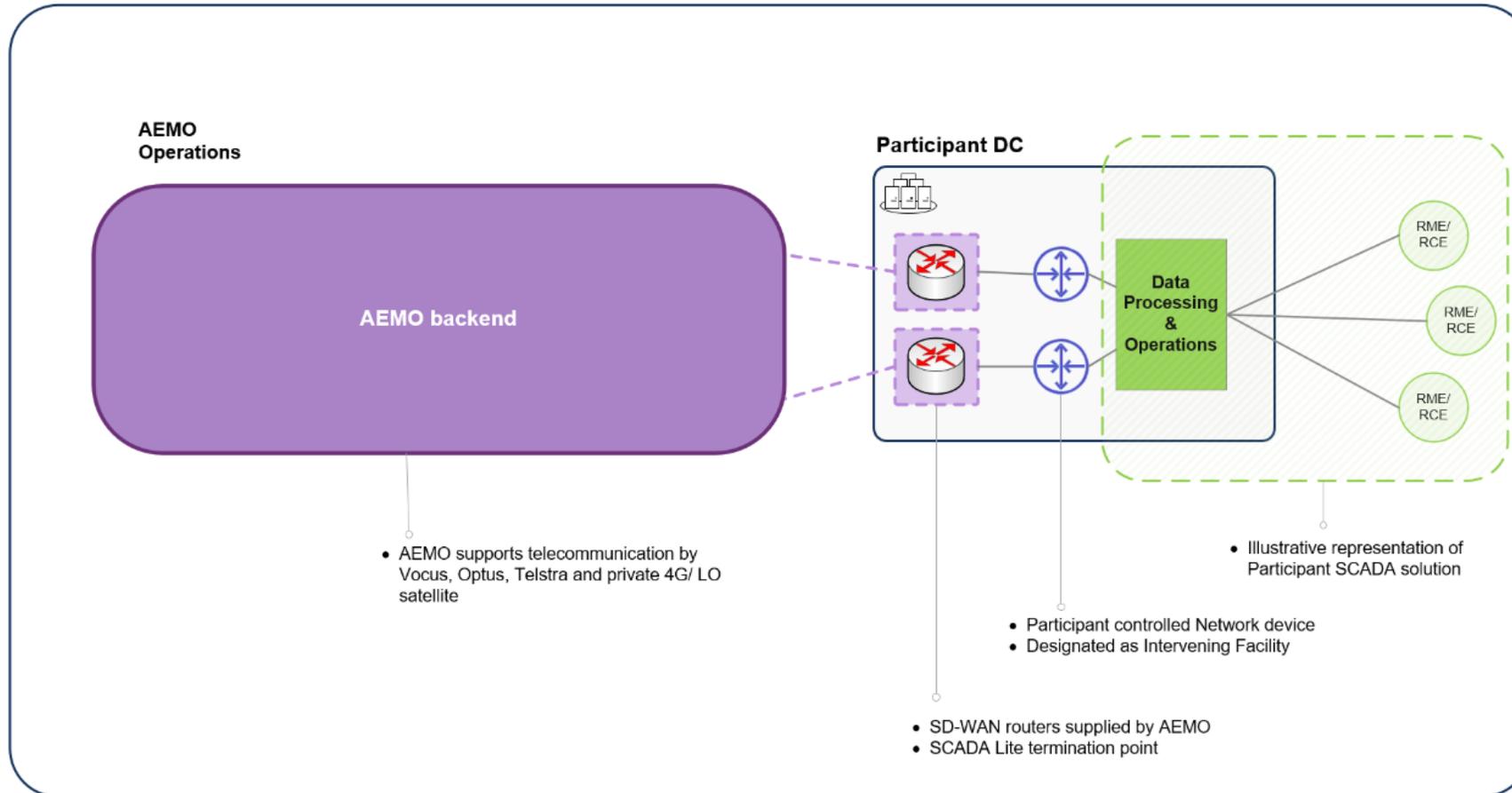
- SCADA Lite functional and non-functional requirements will be developed in line with the published Standard
- Some key clauses that will be relevant to a SCADA Lite connection include:

| Item                            | Description   |
|---------------------------------|---|
| <b>Protocol Definitions</b>     | <p><i>“All data to be transmitted as either:</i></p> <ul style="list-style-type: none"> <li>• <i>Secure ICCP; or</i></li> <li>• <i>Secure DNP3 SAv5.0 (or later version)”</i></li> </ul>  |
| <b>Connections</b>              | <p><i>“All Intervening Facilities must maintain simultaneous active data communications with both AEMO co-ordinating centres”</i></p>   |
| <b>Risk management plan</b>     | <p><i>“All DCPs must have in place a risk management program that identifies and manages material security risks”</i></p>   |
| <b>Reliability Requirements</b> | <ul style="list-style-type: none"> <li>• <i>Maximum outage times aggregated over 12-month period</i></li> <li>• <i>Redundant assets</i></li> <li>• <i>Back-up power supplies for communication infrastructure</i></li> </ul>  |
| <b>Performance benchmarks</b>   | <ul style="list-style-type: none"> <li>• <i>End-to-end transmission times</i></li> <li>• <i>Data resolution</i></li> </ul>  |
| <b>SOCI</b>                     | <p><i>The Standard may:</i></p> <ul style="list-style-type: none"> <li><i>(i) extend requirements corresponding with the SOCI Act to DCPs that are not responsible entities or otherwise subject to the SOCI Act; or</i></li> <li><i>(ii) apply additional requirements to responsible entities in relation to security risks relating to the transmission of Operational Data</i></li> </ul> |

# General Properties

- All data to be exchanged will follow SCADA data point schedule published by AEMO to Participants.
- Security and reliability requirements will be baselined according to The Power Systems Data and Communications Standard and the NER.
- Data traffic (routing, forwarding and mapping) between AEMO end-point and Participant SCADA Lite endpoint to be in the control of the market operator.
- Two active links between Participant's Intervening Facility and AEMO co-ordinating centres NOR & BNE.
  - The links will operate as active/active
- Data collected through SCADA Lite will be used for market operations functionality. The data collected by AEMO through SCADA Lite will not be shared with NSPs and/or other Participants. Sharing may be allowed post Participant approval.

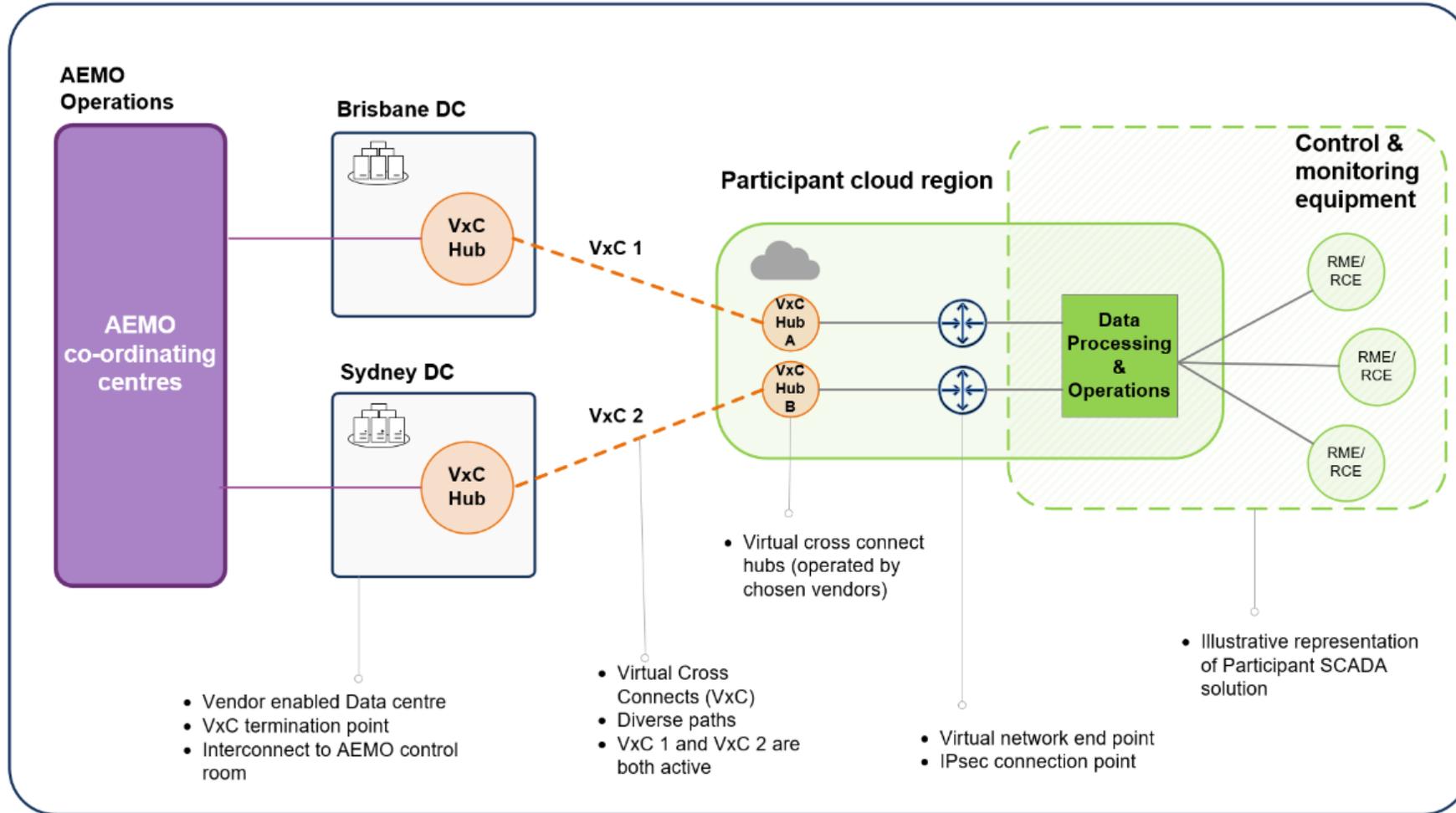
# SCADA Lite – Use Case 1



- Dual Cisco SD-WAN routers installed in secure location inside data centre
- AEMO SD-WAN extended to site facility
- AEMO SD-WAN supported by multiple carriers
- AEMO System is designed as a High Availability (HA) network with no single source of failure
- Authentication and certificate exchange managed by AEMO

Note: RME – Remote Monitoring Equipment, RCE – Remote Control Equipment

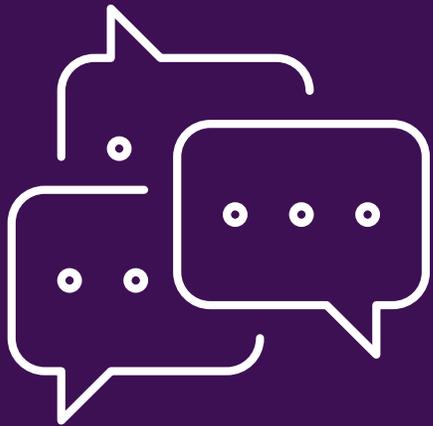
# SCADA Lite – Use Case 2



- The service will initially support the three major cloud providers:
  - Amazon Web Services
  - Microsoft Azure
  - Google Cloud
- Cloud tenancy must be hosted in an Australia based data centre
- IPsec encryption will be utilised over the link to secure traffic within the network tunnels
- VxC (Virtual Cross Connect) links may be procured and provided from multiple service providers

Note: RME – Remote Monitoring Equipment, RCE – Remote Control Equipment

# 6. General Questions & Feedback



For any further and any queries may be sent to [NEMREFORM@aemo.com.au](mailto:NEMREFORM@aemo.com.au).



For more information visit

[aemo.com.au](http://aemo.com.au)