



DER Market Integration Consultative Forum

19 August 2021

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

*We pay our respects to their Elders past,
present and emerging.*

AEMO Competition Law Meeting Protocol

AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO regarding proposed reforms or other initiatives, all participants agree to adhere to the CCA at all times and to comply with this Protocol. Participants must arrange for their representatives to be briefed on competition law risks and obligations.

Participants in AEMO discussions **must**:

1. Ensure that discussions are limited to the matters contemplated by the agenda for the discussion
2. Make independent and unilateral decisions about their commercial positions and approach in relation to the matters under discussion with AEMO
3. Immediately and clearly raise an objection with AEMO or the Chair of the meeting if a matter is discussed that the participant is concerned may give rise to competition law risks or a breach of this Protocol

Participants in AEMO meetings **must not** discuss or agree on the following topics:

1. Which customers they will supply or market to
2. The price or other terms at which Participants will supply
3. Bids or tenders, including the nature of a bid that a Participant intends to make or whether the Participant will participate in the bid
4. Which suppliers Participants will acquire from (or the price or other terms on which they acquire goods or services)
5. Refusing to supply a person or company access to any products, services or inputs they require

Under no circumstances must Participants share Competitively Sensitive Information. Competitively Sensitive Information means confidential information relating to a Participant which if disclosed to a competitor could affect its current or future commercial strategies, such as pricing information, customer terms and conditions, supply terms and conditions, sales, marketing or procurement strategies, product development, margins, costs, capacity or production planning.

Today's meeting

Time	Item	Speaker
11:00 – 11:05	Welcome and introductions	Matthew Armitage
11:05 – 11:10	Virtual Power Plant Demonstrations Update	Matthew Armitage
11:10 – 11:40	Integrating Energy Storage Systems – Overview & feedback	Joel Aulbury
11:40 – 12:10	Project EDGE Research Question feedback	Nick Regan / Pierluigi Mancarella / Shiraq Riaz
12:10 – 12:20	Q&A	<i>Via Slido.com – use code #MICF</i>
12:20 – 12:25	Any other business	All
12:25 – 12:30	Future Meetings & Close	Matthew Armitage



VPP Demo & MASS Consultation update

MASS Consultation Overview

 We are here



- AEMO are reviewing the submissions to the draft determination.
- Further updates on the MASS consultation will be communicated via direct email & AEMO comms.
- Please contact MASS.consultation@aemo.com.au for any questions.

Integrating Energy Storage Systems

Overview of draft determination & informal feedback

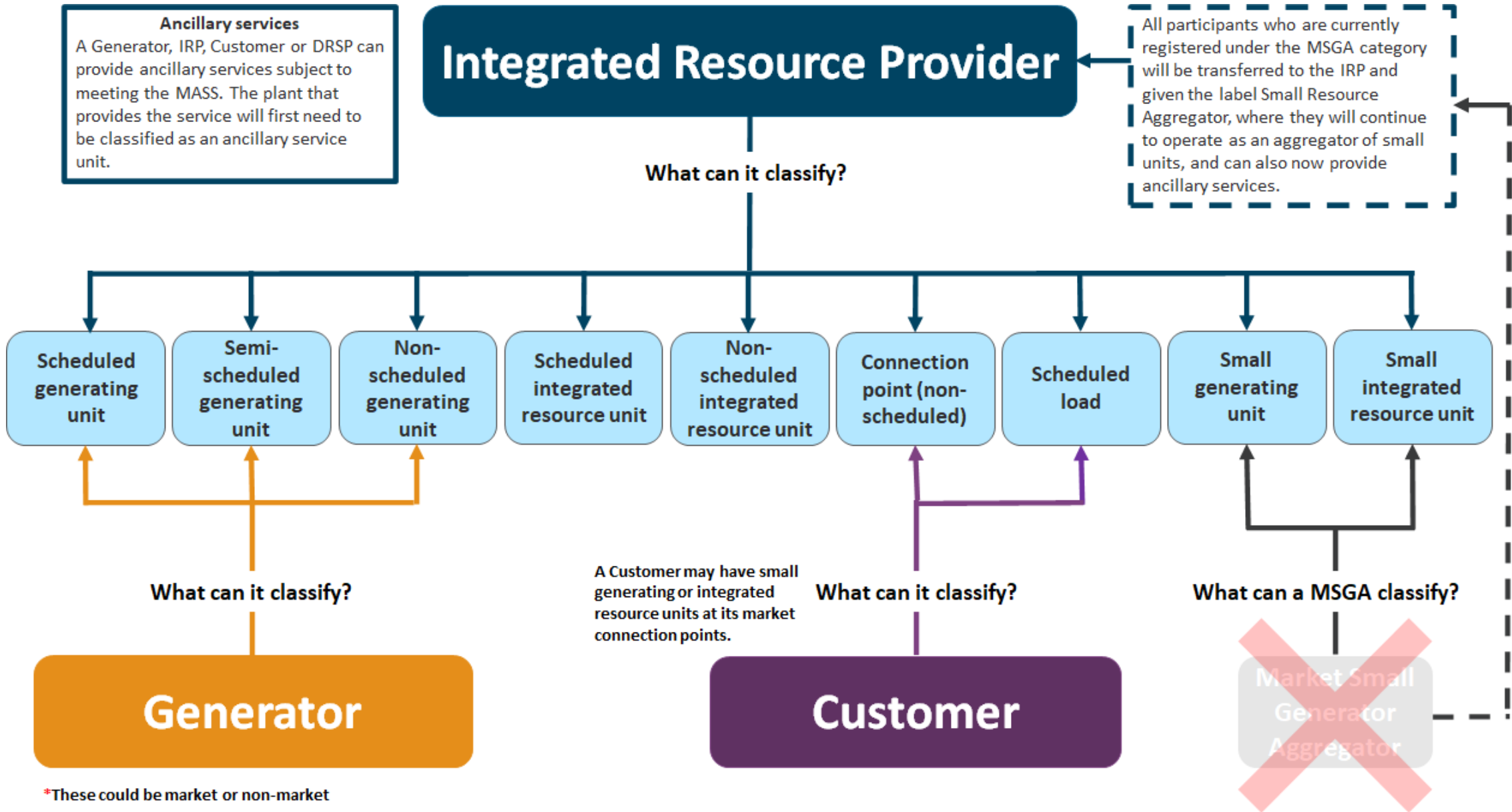
INTEGRATING ENERGY STORAGE SYSTEMS INTO THE NEM

DRAFT DETERMINATION STAKEHOLDER SESSION

19 AUGUST 2021

AEMC

Classifications and services that can be provided by Market Participants



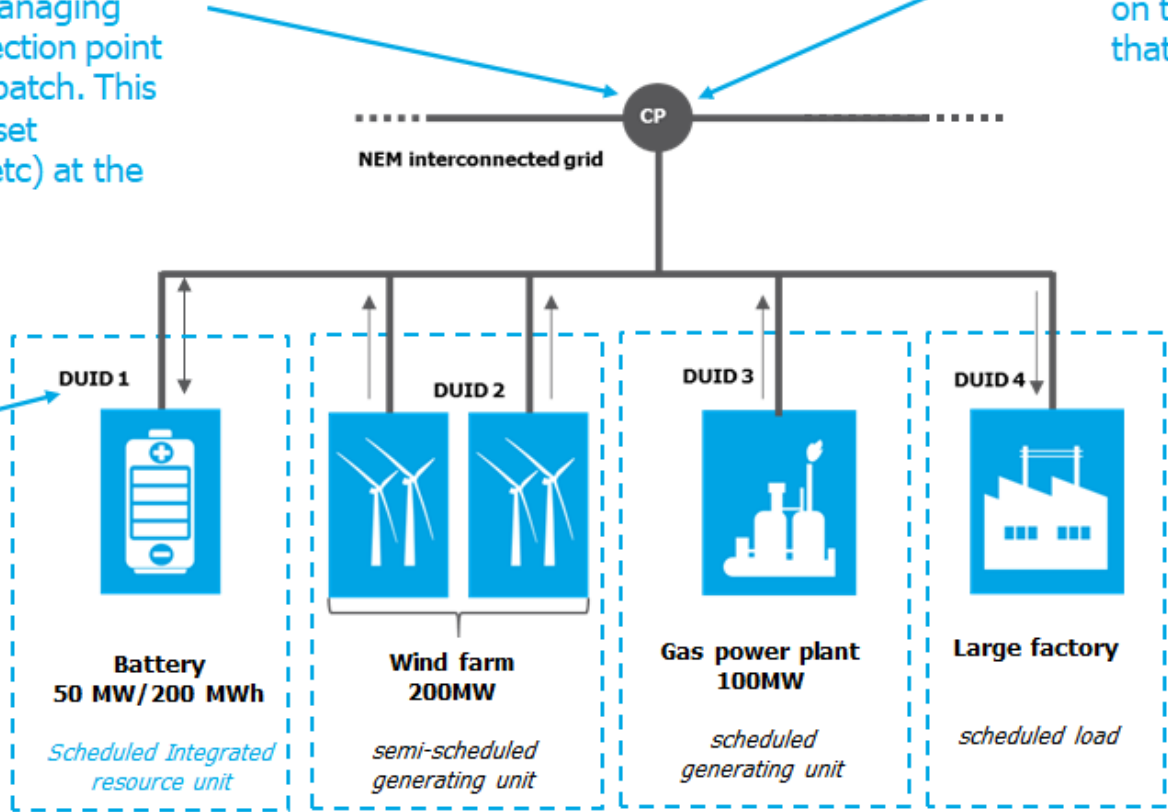
How a hybrid facility would register and participate under the draft decision

We are proposing that the AER measure **compliance with dispatch** at the connection point or at unit level, as determined by an AEMO power system operating procedure. This will allow hybrid systems to benefit from self managing energy flows behind the connection point and choosing how to meet dispatch. This will not limit AEMO's ability to set constraints (or instruct/direct etc) at the unit level where appropriate.

A participant seeking to set up a hybrid facility would **register** as an Integrated Resource Provider (IRP)

Performance standards would be set at the unit level but would be measured at the connection point. As now, each grid-scale unit would connect through Chapter 5 of the NER, which requires information on the technical characteristics of the unit that impact the power system.

Single DUID for integrated resource units. This is a change from the two DUIDs that currently exist for grid-scale batteries. The participant would have 20 price bid bands (10 for load and 10 for generation).



Classifications and scheduling would be at the unit level (for both the energy and ancillary service markets). AEMO would send dispatch instructions to each unit.

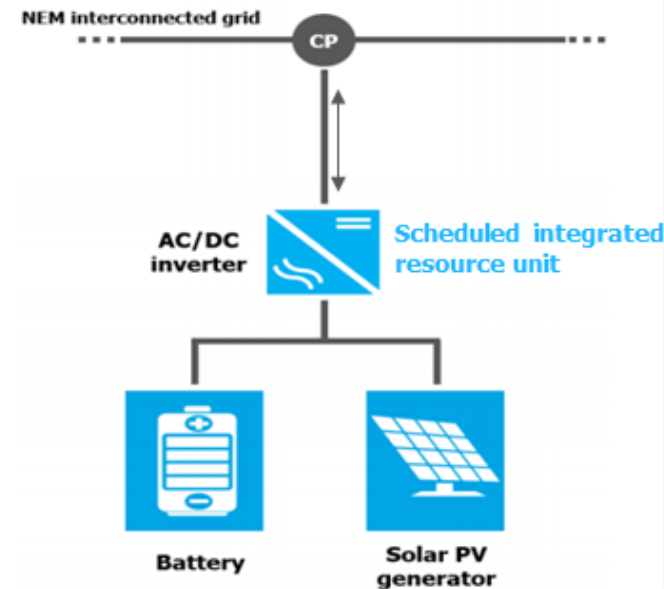
* This diagram is an example of a potential hybrid facility. A hybrid facility could vary in the number and type of units behind its connection point.

How a DC coupled facility would register and participate under the draft decision*

DC coupled system proponents (above 5MW) would register as an IRP and would then have the option to classify the units in their system in one of the following ways:

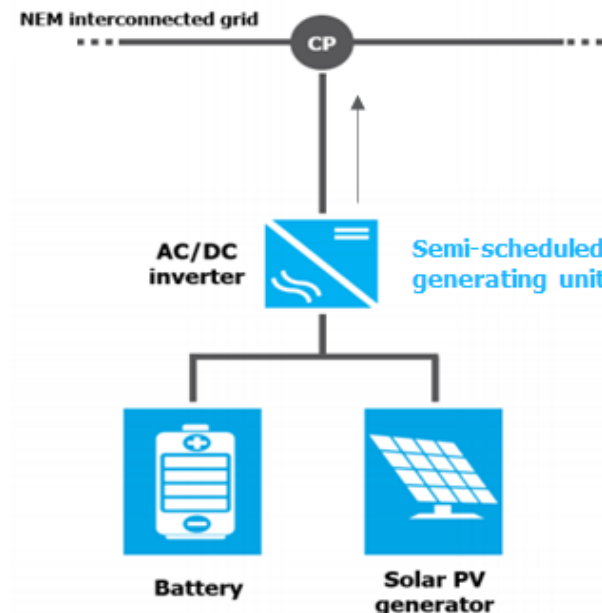
Scheduled integrated resource unit (IRU):

- Participate in the same way a grid-scale battery (over 5MW) would, as a scheduled IRU.
- Single DUID with 20 price bid bands (10 for load and 10 for generation).



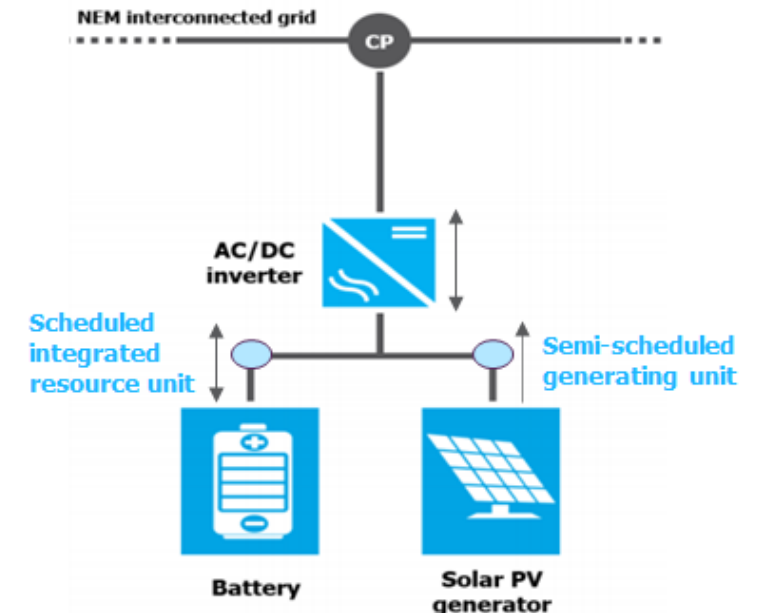
Semi-scheduled generating unit:

- Participate in the same manner as an existing stand alone grid scale intermittent generator (over 30MW) as a semi-scheduled generating unit.
- Dispatch limited by AEMO's unconstrained intermittent generation forecast (UGIF) as well as the level specified by AEMO during 'semi-dispatch' intervals (as per existing requirements).
- Consumption from the grid limited to auxiliary load; battery cannot be charged from the grid.



Multiple classifications:

- Plant behind the inverter classified as separate units with individual DUIDs allowing independent operation.
- Plant that satisfies existing criteria to be classified as a semi-scheduled generating unit.
- Plant that satisfies the draft rule's new criteria can be classified as an integrated resource unit.
- Specific requirements (telemetry/metering etc) to be set out in an AEMO guide to registration.

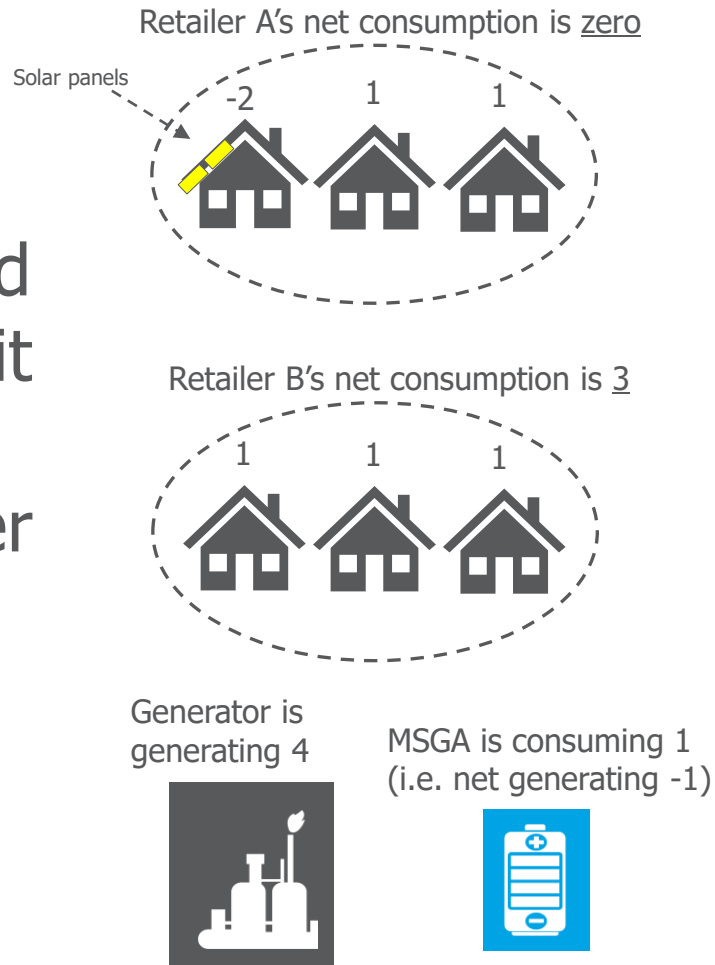


* This diagram is an example of a stand alone DC coupled system. These options could also be used in a hybrid facility. A DC coupled system could vary in the number and type of plant behind the inverter.

Recovery of non-energy costs – an example of the proposed change

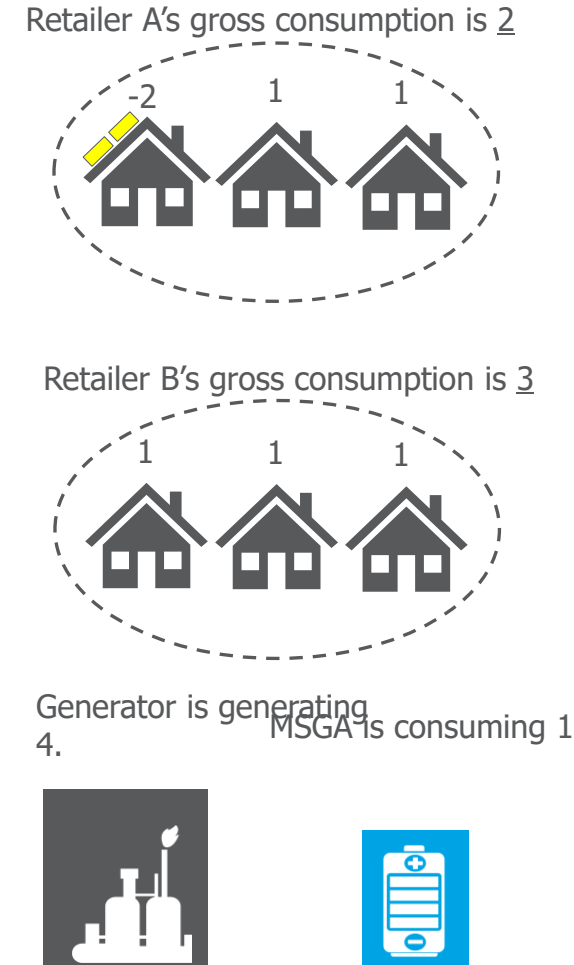
This example uses a settlement interval during the day when it is sunny, and a non-energy service that is recovered based on consumption (e.g. FCAS contingency lower event).

Current framework



Total net consumption from Market Customers = 3.
Retailer B pays all of the cost.

Proposed approach



Total gross consumption from all participants = 6.
Retailer A pays 2/6, Retailer B pays 3/6, MSGA pays 1/6.

All costs would be recovered based on consumed energy that would be spread proportionally across participants' gross energy consumption.

All costs are paid by retailer B as it is the only Market Customer with a positive net consumption.

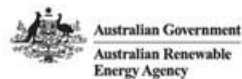
QUESTIONS & DISCUSSION

Project EDGE:

Research plan overview & feedback

Project EDGE | Research Plan Development

DER Market Integration Consultative Forum



Purpose

1. Gain feedback on the research questions and hypotheses shared on Monday 9 August 2021.

Overview

The purpose of Project EDGE is to build off the work of the Open Energy Networks Program to test the 'Hybrid Model' in practice and support reform.



An independent, expertly-designed Research Plan is seen as critical to support major industry reform.

An expert, independent party is important to develop the Research Plan because the Project:

Needs to build an evidence base to support industry that has integrity

Is a first-of-its-kind trial

Operates within an ecosystem of other innovative demonstration projects that it can complement

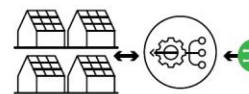
The UoM have been engaged to develop the Research Plan because they bring:

World-class research design capability and experience

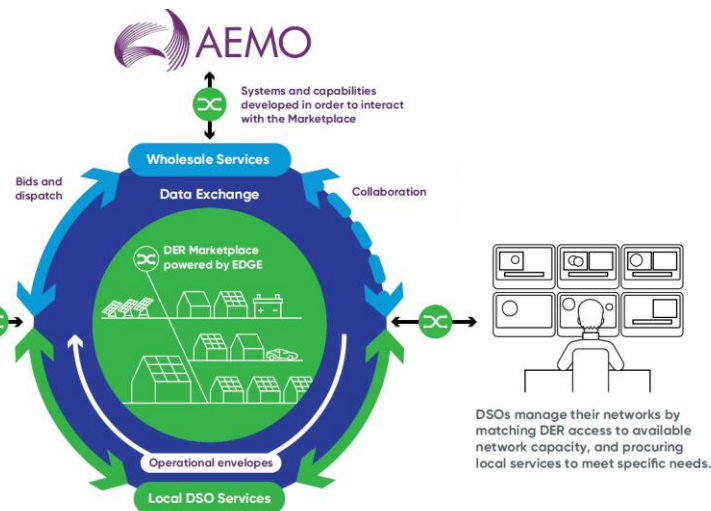
Considerable knowledge of international related work and markets

A collaborative approach to work with the Project Team and others to understand what is happening in Australia

Aggregator



Aggregators use EDGE to access and deliver electricity services on behalf of consumers, including wholesale services to AEMO and local network services to DSOs.

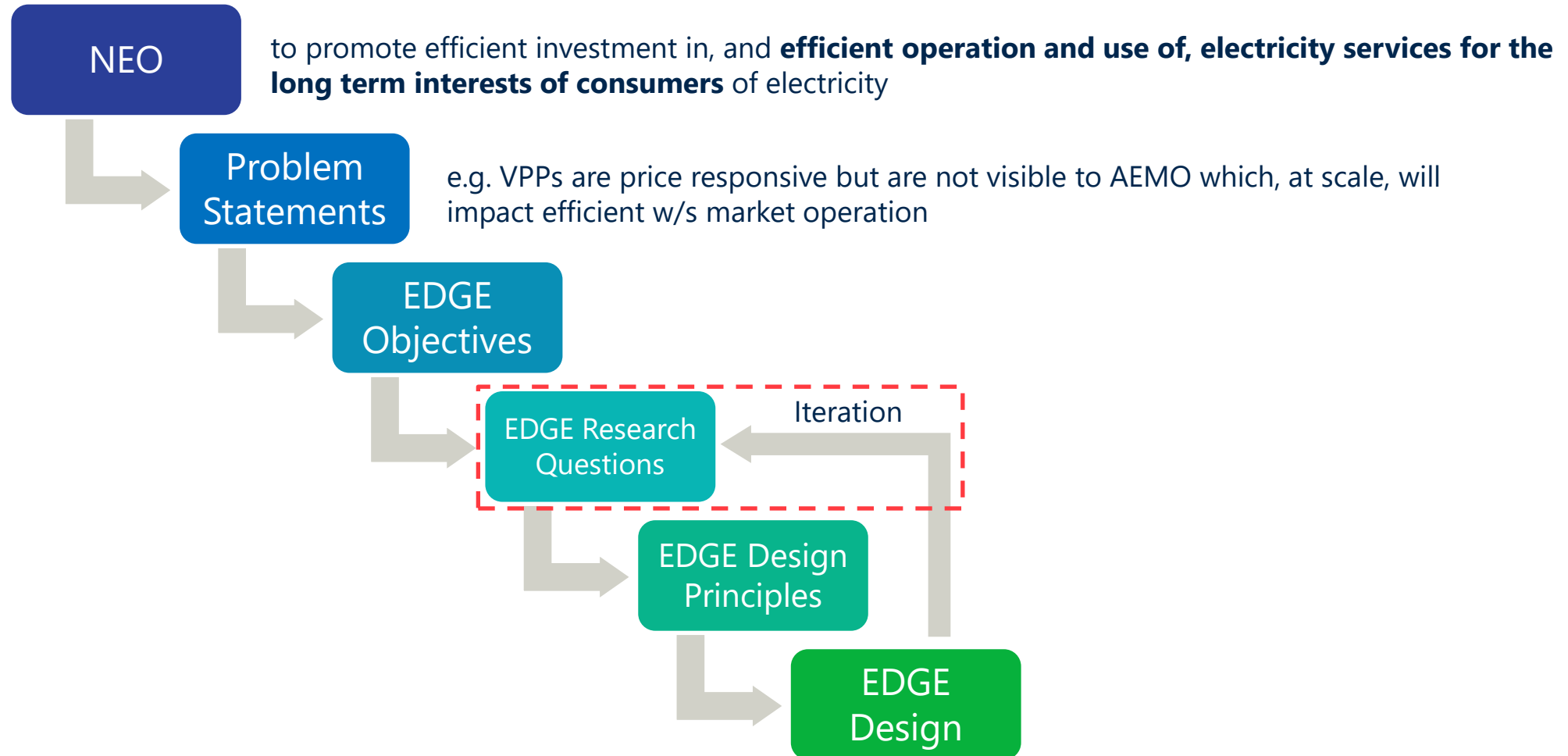


Distribution System Operator

DSOs manage their networks by matching DER access to available network capacity, and procuring local services to meet specific needs.

The world class research team at the UoM are currently supporting the team to refine the Research Questions.

The National Electricity Objective has been used as the ultimate guide in co-designing the Project and high-level marketplace.



The Research Questions and its hypotheses must be traceable back to the Project EDGE Objectives, and ultimately the NEO.

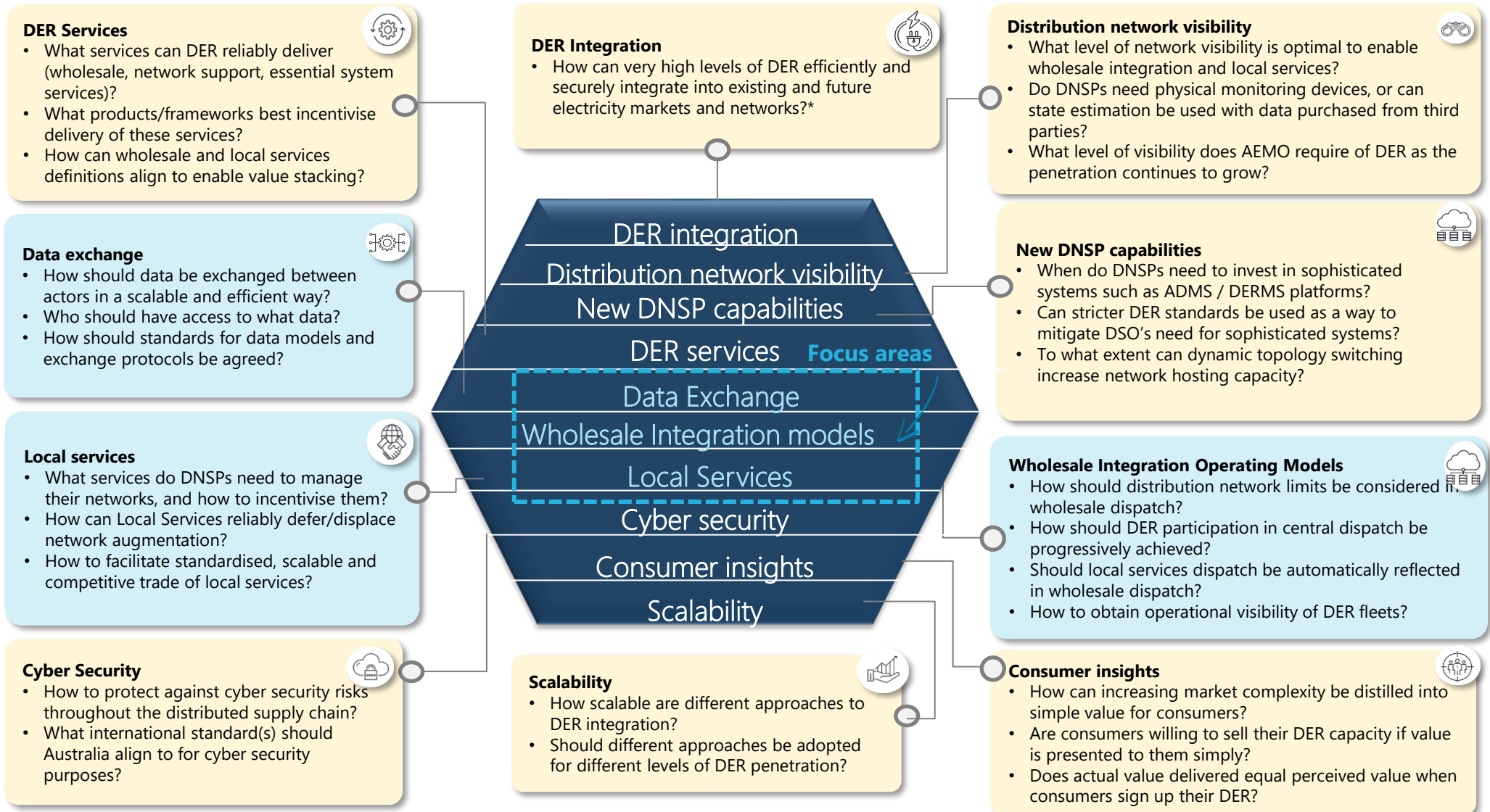
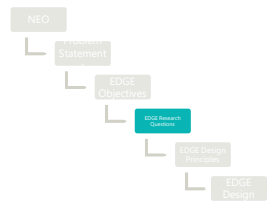


Project EDGE Objectives:



1	WHOLESALE MARKET PARTICIPATION ENABLED AT SCALE Demonstrate how DER fleets could participate in existing and future wholesale energy markets at scale	Marketplace technical requirements
2	DISTRIBUTION NETWORK LIMITS IN WHOLESALE DISPATCH CONSIDERED Demonstrate different ways to consider distribution network limits in the wholesale dispatch process	
3	EFFICIENT AND SCALABLE TRADE OF LOCAL NETWORK SERVICES ENABLED Demonstrate how to facilitate standardised, scalable and competitive trade of local network services	
4	EFFICIENT, SCALABLE AND SECURE DATA EXCHANGE ENABLED Demonstrate how data should be exchanged efficiently and securely between interested parties to support delivery of distributed energy services	
5	INTEGRATED PLATFORM Develop a proof of concept, integrated software platform to facilitate delivery of objectives 1-4 in an efficient and scalable way	
6	DEFINED ROLES AND RESPONSIBILITIES Develop a detailed understanding of roles and specific responsibilities that each industry actor should play	Enablers for implementable reform
7	COST BENEFIT ANALYSIS COMPLETED Conduct comprehensive cost benefit analysis to provide an evidence base for future regulatory decision making	
8	CUSTOMER PERSPECTIVE ENGAGED Conduct a customer focused social science study to understand customer opinions on the complexities of DER integration	
9	STAKEHOLDERS ENGAGED ACCORDING TO BEST PRACTICE PRINCIPLES Deliver best practice stakeholder engagement throughout the project with a commitment to knowledge sharing	
10	EVIDENCE-BASED IMPLEMENTATION RECOMMENDATIONS PROVIDED Deliver recommendations, supported with evidence, on how and when the concepts demonstrated should be implemented operationally	

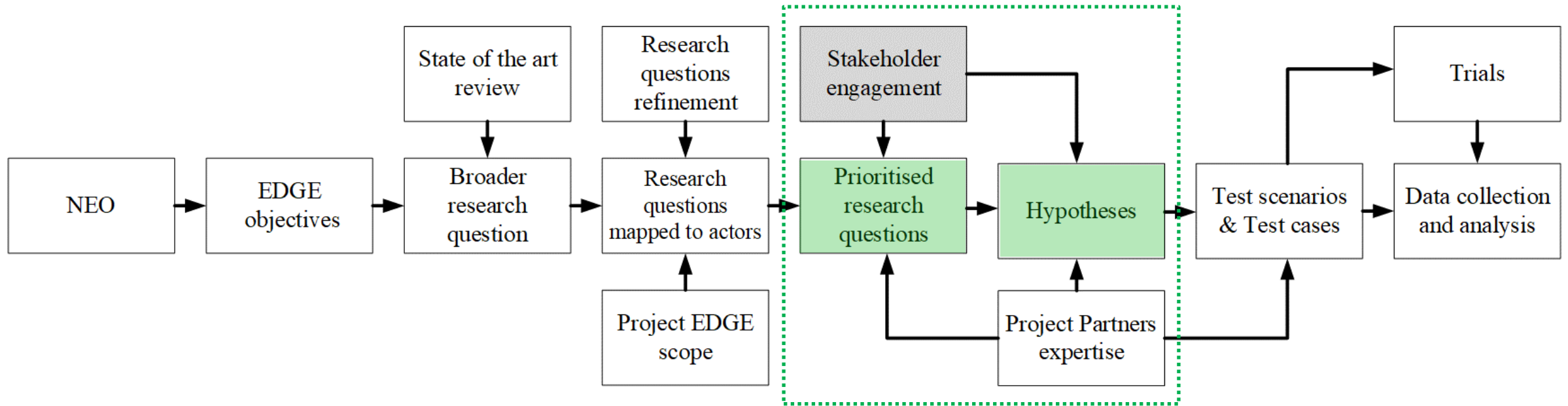
The Project Participants co-developed initial research questions. These were used to progress early trial design and platform development.



*Efficiently means finding the framework that delivers greatest net benefit to consumers. Securely means including distribution level network constraints in security constrained dispatch.

UoM has employed an iterative approach to test and refine broad research questions into Prioritised Research Questions and Research Hypotheses.

This approach picked up the initial research questions and refined through a literature review and consultation process.

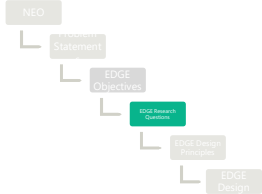


Stakeholder Engagement steps:

1. The Project Team will capture and share the verbal feedback received during today's meeting.
2. The Project Team will also share the draft Research Questions and hypotheses.
3. Participants are requested to confirm the verbal feedback and encouraged to provide further written feedback by email to the UoM via shariq.riaz@unimelb.edu.au

Research Questions – Open Discussion & Feedback

Prioritised Research Questions for project EDGE



- 1 CUSTOMER INSIGHTS** | To what extent will customer insights and engagement help improve the design of the DER marketplace?
- 2 DER MARKETPLACE ARRANGEMENTS** | What are the most economically efficient DER marketplace and commercial arrangements under different conditions of DER penetration level, density, dispatchability, and so on?
- 3 OPERATING ENVELOPES DESIGN** | What is the impact of operating envelope design on the efficient allocation of network capacity to different DER and aggregators while enabling the provision of local and wholesale services?
- 4 DER SERVICES PROVISION** | How can wholesale energy and local network services be reliably delivered by DER in a standardised and scalable way, and what are the practical implications for enabling a competitive marketplace?
- 5 RELIANCE ON DER FOR NETWORK SUPPORT** | In a high DER penetration scenario, what are the barriers to increase the reliance on DER in providing local services for distribution network support?
- 6 DATA EXCHANGE** | How does data exchange among all actors enables an efficient and scalable DER marketplace considering data privacy and security?
- 7 DNSP INVESTMENT OPTIONS** | To what extent could DNSP investment improve the economic efficiency of the DER marketplace?
- 8 UNCERTAINTY AND FORECAST** | What is the impact of uncertainty (e.g., DER and demand forecast) on efficient marketplace operation and how could it be mitigated?

Close & Next Steps

- A detailed document with the research questions and hypotheses has been provided for further feedback and questions following the meeting.
- Feedback captured as part of this meeting will be circulated for confirmation.
- Please contact Shariq Riaz to provide further feedback or if you have questions:
shariq.riaz@unimelb.edu.au



Q&A

Join via [slido.com](https://www.slido.com) using code #MICF

Any other business

Stakeholder survey – outcomes.

Survey Outcomes

We received some great feedback, with some areas for improvement.

Overall, **all respondents indicated these forums were useful** (either “very useful” or “somewhat useful”).

Some of the specific positive feedback received from respondents indicated:

- They value the opportunity to gain updates on other policy changes and upcoming consultations relating to DER market integration.
- There is a good balance between different views being aired and discussion.
- The information provided is relevant and updates are clear.
- The forums are timely and well run, and should be continued.

Survey Outcomes

Areas for improvement, and how we would like to address this is provided below:

Feedback	Actions to address feedback
Slides to be provided in advance of meetings.	AEMO endeavour to provide slides 5 days prior to forums and meetings. We have revised our preparation practices and will aim to meet this commitment more consistently.
Store presentations in a central repository.	A sharepoint has been established for this purpose. If you do not have access, or are unsure of your access, please contact DERProgram@aemo.com.au .
Maintain regular timings/dates of meetings according to schedules.	A review of timing has been completed and we do not foresee further adjustments to meeting dates.
Ensure content is sufficient for the full session.	Content is designed for engagement and discussion – to enable robust discussion, 1.5hr sessions have been booked. Where opportunities for discussion may be limited, or where we feel content is not sufficient, we will aim to reduce sessions to 1 hr.
Provide more structure to avoid discussions becoming bogged down.	We will aim to keep discussions on topics, however, often find it useful to allow discussions to continue to understand what stakeholder concerns and views are. Please advise if there are specific areas where more structure could be introduced.
Encourage greater discussion.	While Slido.com is available for raising questions, we also welcome questions and discussions through the 'raise hand' function! If you have a view, we would encourage your engagement in the session.



Future Meetings & Close

Next meeting: 16 September 2021

Future Meetings

Note that future meetings will be pushed to the 3rd/4th week of each month on the same day and time. A reschedule of the existing meetings will be issued shortly.

Indicative dates:

- **Thursday, 21 October 2021**
- **Thursday, 18 November 2021**

Note:

- Agenda & meeting documents will aim to be provided 5 days prior to meetings.
- Meeting actions will be distributed within 5 days post meetings (as required).
- Non-confidential information will be shared following each meeting.



Questions & contact

DERProgram@aemo.com.au