

Project EDGE | Research Plan Development

Demonstrations Insights Forum



Purpose of this meeting

1. Provide an overview of University of Melbourne's role and the approach to developing the Research Plan and Questions.
2. Discuss the research questions and project activities.

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

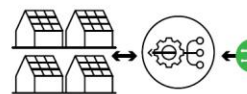
The UoM have been engaged to develop the Research Plan because they bring:

World-class research design capability and experience

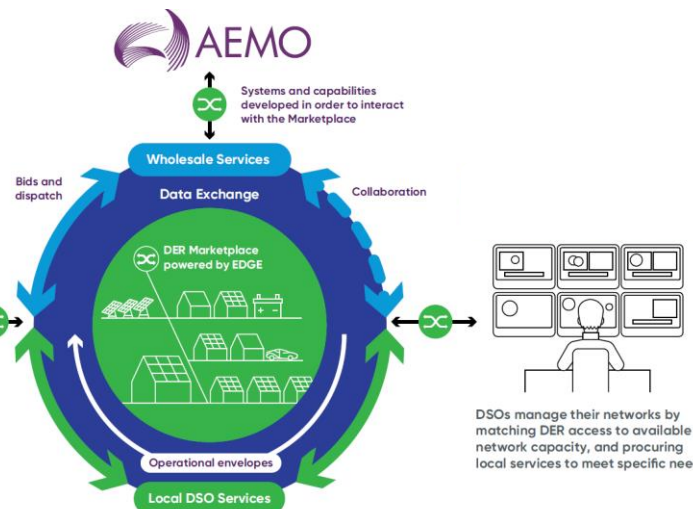
Considerable knowledge of international related work and markets

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

Aggregator



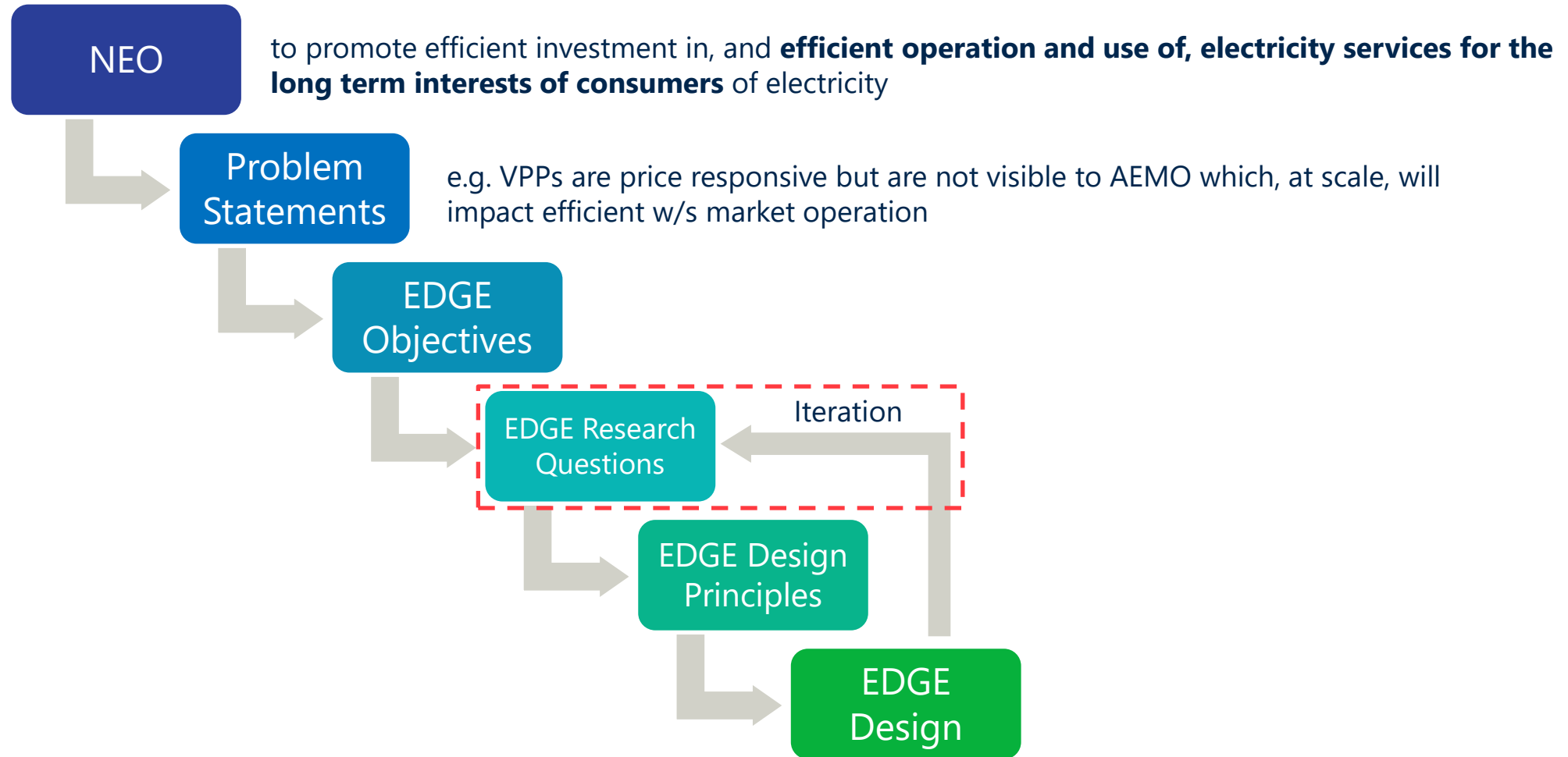
Aggregators use EDGE to access and deliver electricity services on behalf of consumers, including wholesale services to AEMO and local network services to DSOs.



Distribution System Operator

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.

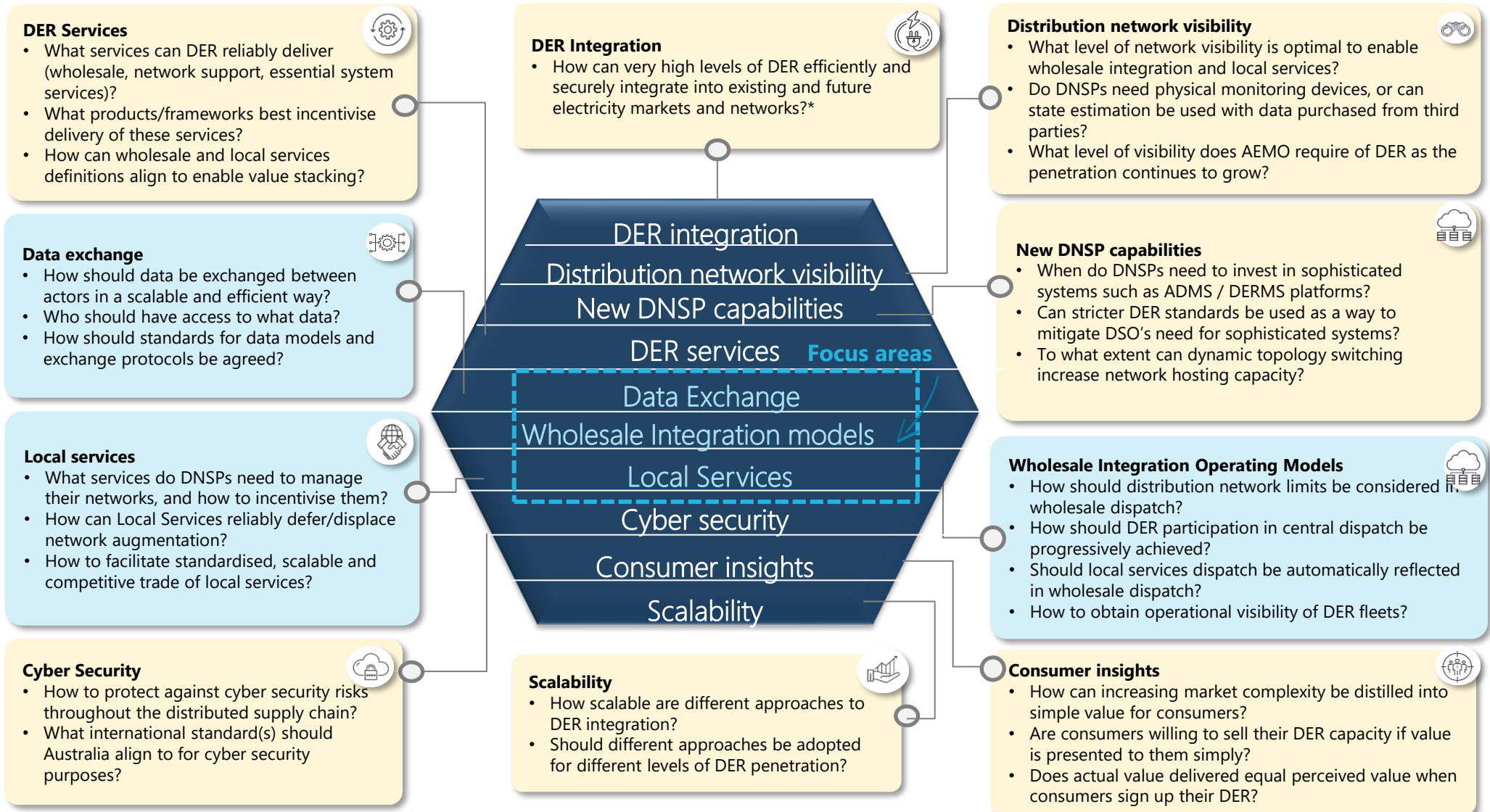
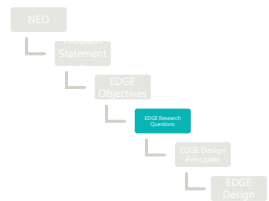


Project EDGE Objectives:



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	Enablers for implementable reform
6	DEFINED ROLES AND RESPONSIBILITIES Develop a detailed understanding of roles and specific responsibilities that each industry actor should play	
7	COST BENEFIT ANALYSIS COMPLETED Conduct comprehensive cost benefit analysis to provide an evidence base for future regulatory decision making	Enablers for implementable reform
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	

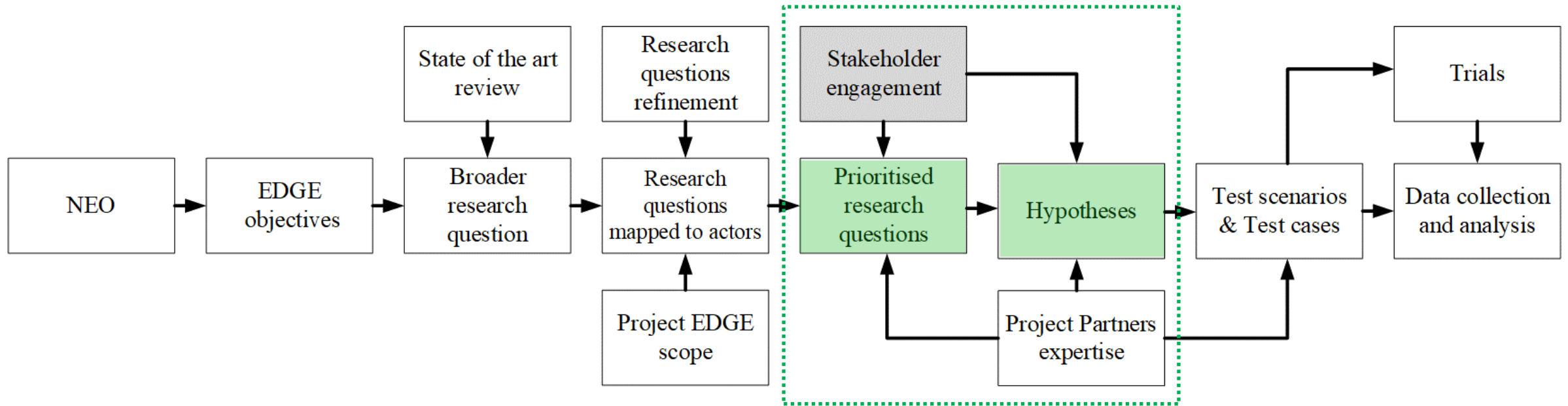
The Project Participants co-developed initial research questions. These were used to progress early trial design and platform development.



*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.



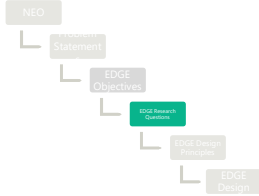
Stakeholder Engagement steps:

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 and feedback

UoM has refined the Prioritised Research Questions.



- 1 CUSTOMER INSIGHTS** | To what extent will customer insights and engagement help improve the design of the DER marketplace?
- 2 NEW DNSP CAPABILITY** | What are the most economically efficient DER marketplace and commercial arrangements under different conditions of DER penetration level, density, dispatchability, and so on?
- 3 WHOLESALE INTEGRATION OPERATING MODELS** | 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 LOCAL SERVICES** | How can wholesale energy and local network services be reliably delivered by the DER fleet in a standardised and scalable way, and what are the practical implications for enabling a competitive marketplace?
- 5 NETWORK RELIABILITY** | 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 enable an efficient and scalable DER marketplace considering data privacy and security?
- 7 DSO INVESTMENT OPTIONS** | To what extent could DSO investment improve the economic efficiency of the DER marketplace?
- 8 UNCERTAINTY AND FORECAST** | What is the impact of DER forecast uncertainty on efficient marketplace operation and how could it be mitigated?

The Prioritised Research Questions provide coverage across each of the Project EDGE Objectives.



Project Objectives →		①	②	③	④	⑤	⑥	⑦	⑧
Research Questions ↓		Wholesale market participation enabled at scale	Distribution network limits in wholesale dispatch considered	Efficient and scalable trade of local network services enabled	Efficient, scalable and secure data exchange enabled	Integrated platform	Defined roles and responsibilities	Cost benefit analysis completed	Customer perspective engaged
①	Customer insights To what extent will customer insights and engagement help improve the design of the DER marketplace?							Green	Green
②	New DNSP Capability What are the most economically efficient DER marketplace and commercial arrangements under different conditions of DER penetration level, density, dispatchability, and so on?	Blue	Blue	Blue			Green	Green	
③	Wholesale integration operating models 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?	Blue	Blue	Blue				Green	
④	Local Services How can wholesale energy and local network services be reliably delivered by the DER fleet in a standardised and scalable way, and what are the practical implications for enabling a competitive marketplace?	Blue		Blue				Green	
⑤	Network reliability In a high DER penetration scenario, what are the barriers to increase the reliance on DER in providing local services for distribution network support?			Blue				Green	
⑥	Data exchange How does data exchange among all actors enable an efficient and scalable DER marketplace considering data privacy and security?				Blue	Green			Green
⑦	DSO investment options To what extent could DSO investment improve the economic efficiency of the DER marketplace?						Green	Green	
⑧	Uncertainty and forecast What is the impact of DER forecast uncertainty on efficient marketplace operation and how could it be mitigated?	Blue		Blue			Green	Green	

⑨ Stakeholders engaged according to best practice principles

⑩ Evidence based implementation recommendations provided

Close and next steps

- A detailed document with the research questions and hypotheses has been provided for further feedback and questions prior to this 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 on: shariq.riaz@unimelb.edu.au