

Project EDGE (Energy Demand & Generation Exchange)

Integration of Renewable & Distributed Energy Resources Conference

October 2022

ARENA ACKNOWLEDGEMENT AND DISCLAIMER

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Project EDGE | A collaboration between AEMO, AusNet & Mondo



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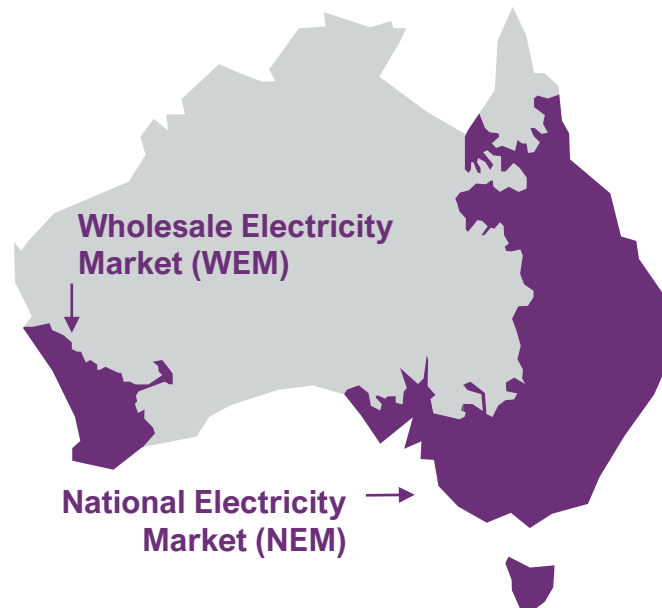
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Project EDGE (Energy Demand and Generation Exchange) is a collaboration between the **Australian Energy Market Operator** (AEMO), **AusNet Services** (AusNet) and **Mondo Power** (collectively, the Project Partners), with financial support from the **Australian Renewable Energy Agency** (ARENA).

The National Electricity Market

How the NEM Works

- The National Electricity Market (NEM) Operates one of the world longest interconnected power systems, a distance of around **5,000** kilometres.
- The NEM spans Australia's eastern and south-eastern coasts and comprises of **five** interconnected states that also act as price regions
- There are over **100 generators** and **retailers** participating in the market, so it's highly competitive and therefore an efficient way of maintaining relatively competitive electricity prices in the wholesale market.



Fast Facts



There are over 504 registered participants in the NEM, including **Market Generators**, **Transmission Network Service Providers (TNSP)**, **Distribution Network Service Providers (DNSP)**, and **Market Customers**.



The NEM commenced operation as a **wholesale spot market** where supply and demand is matched instantaneously in December 1998.



The NEM incorporates around **40,000 km** of transmission lines and cables.



The NEM supplies about **204 terawatt** hours of electricity to businesses and households each year.



\$11.5 billion was traded in the NEM in FY 2020-21.



The NEM supplies approximately **10.7 million** customers.



The NEM has a total electricity generating capacity of **65,252 MW** (as at December 2021).

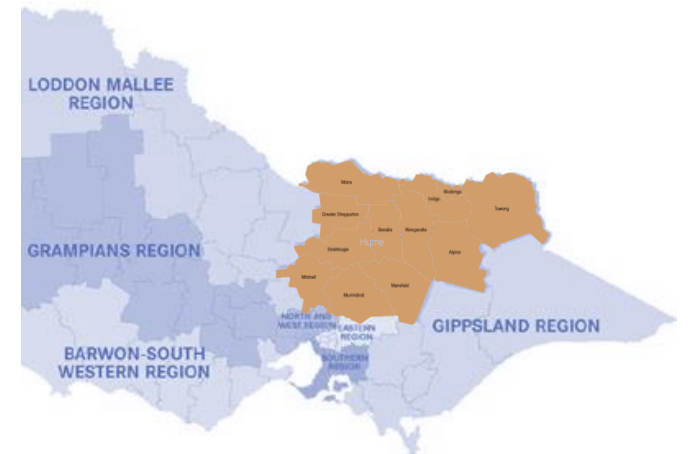


The NEM has approximately **14 GW** of distributed solar (as at Dec 2021). Collectively the **largest** generator in the NEM.

EDGE overview

Project EDGE seeks to demonstrate a proof-of-concept DER Marketplace that enables efficient & secure coordination of aggregated DER, and facilitates the delivery of both wholesale and local network services at the grid edge

Target outcome is to provide an evidence base to inform Australia's Post 2025 NEM reforms regarding an efficient DER integration pathway to the benefit of all consumers



Project EDGE | Cross-industry collaboration



ARENA
Funding Partner

Tech. Partners



DSO capability



energy web

Digital identity & data exchange

PXiSE

Energy Solutions, LLC

Market logic/intelligence

Distribution System Operator

AusNet
services



Aggregators



Power System & Market Operator



Supporting Partners



Networks, Research & Knowledge Sharing



Customer Insights

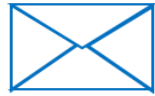
Deloitte.
Cost Benefit Analysis



Knowledge Sharing

nous
Independent Project Manager

Project EDGE – Key functions Overview



Dynamic Operating Envelope (DOE)

- A dynamic operating envelope provides upper and lower bounds on the import or export power, in a given time interval, for either individual DER assets or a connection point.



Bi-directional Offer (BOffer)

- Bi-directional Offer means an offer that includes both generation & load across the aggregator's registered portfolio of NMs. As the trial progresses through various phases the application of BOffers will also go through a progression.



Wholesale Dispatch Instruction

- Dispatch Instructions are issued by AEMO to Aggregators for the purpose of meeting the supply and demand balance in EDGE by either generating (i.e. export to grid) or by consuming (i.e. import from grid) as a DER portfolio

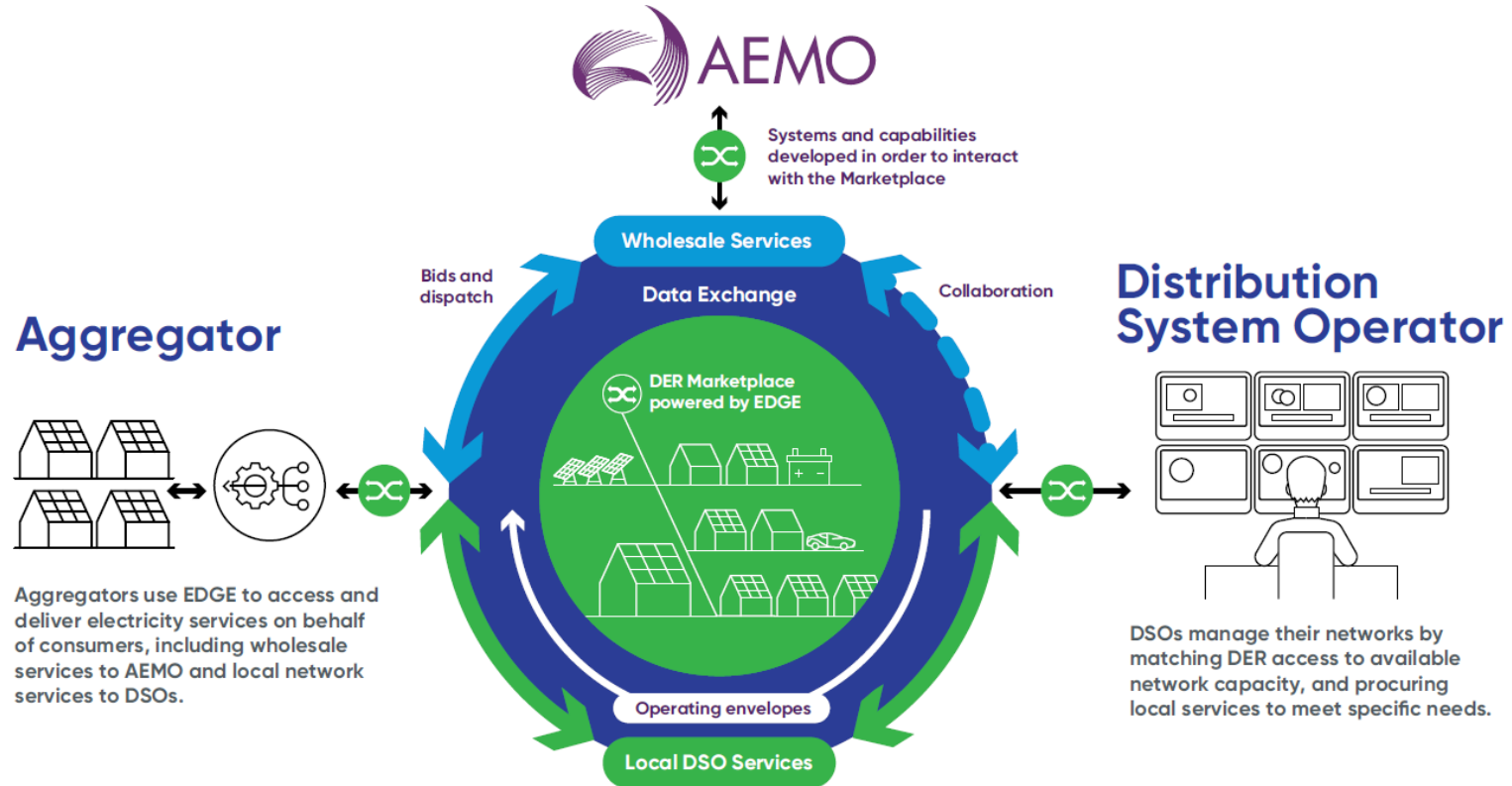


Project EDGE seeks to demonstrate an efficient model for DER integration at scale



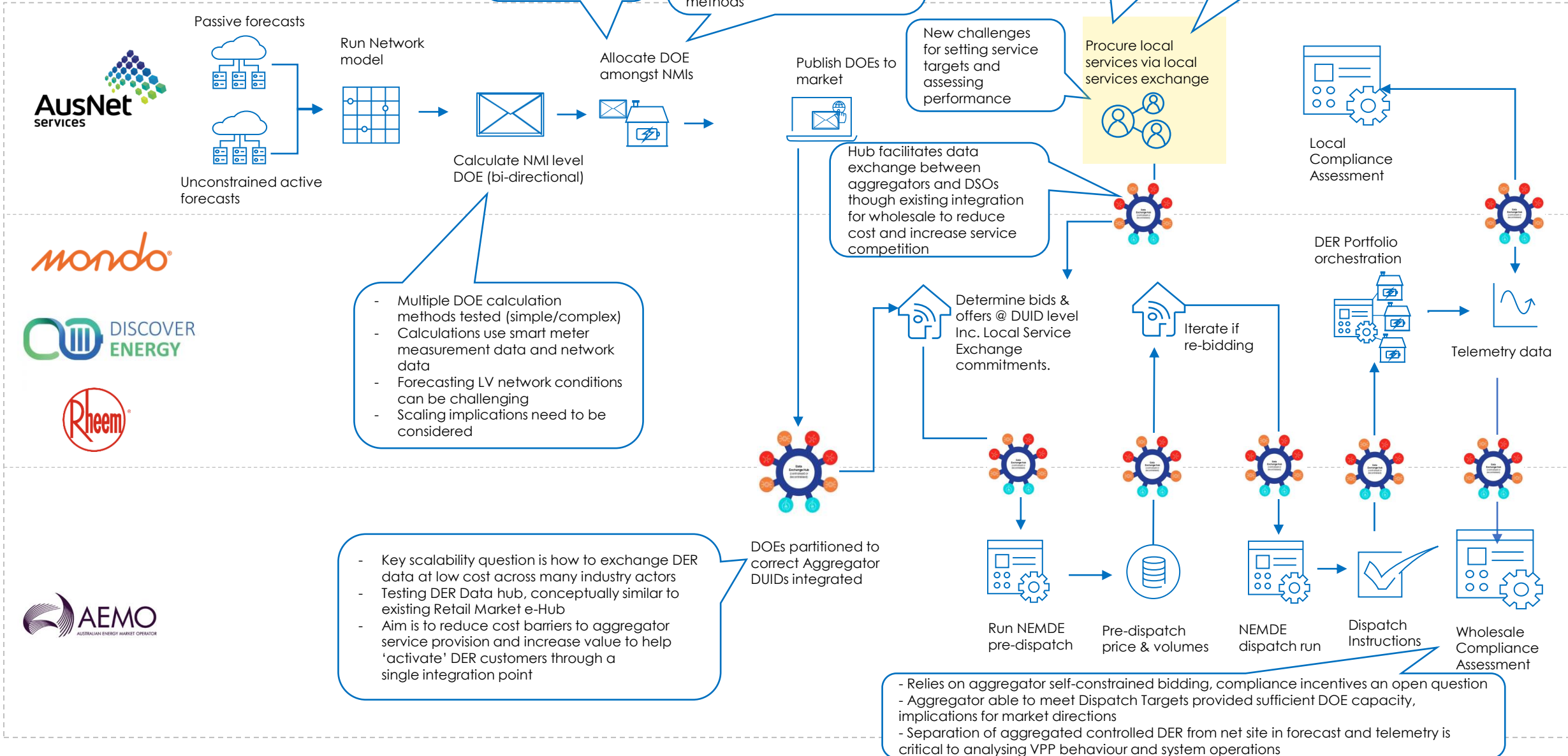
Building on the Open Energy Networks Hybrid model

- Building on OpEN with detailed design underpinned by the NEO
- Open and collaborative approach between partners (AEMO, AusNet & Mondo) and industry
- Scientific approach to delivering a robust evidence base and independent CBA



*The **DER Marketplace** is not a single, AEMO-run platform or capability. Rather, it is an integrated digital ecosystem that links many systems and capabilities across various industry actors to enable the efficient and scalable exchange of data and services.*

Wholesale Market services



AusNet services

mondo

DISCOVER ENERGY

Rheem

AEMO AUSTRALIAN ENERGY MARKET OPERATOR

Project EDGE Publications



Publications	Publication Date
<u>Project EDGE CBA Methodology Consultation Paper</u>	July 2022
<u>Project EDGE Public Interim Report</u>	June 2022
<u>Project EDGE Customer Insights Study</u>	June 2022
<u>Project EDGE Research Plan</u>	March 2022
<u>Project EDGE MVP Showcase</u>	December 2021
<u>The National Electricity Market Fact Sheet</u>	November 2021
<u>Project EDGE Lessons Learned Report #1</u>	May 2021
<u>Project EDGE Public Webinar #1</u>	March 2021
<u>Project EDGE Factsheet</u>	January 2021

For further news and knowledge sharing publications, please visit the [Project EDGE Website](#)

For any questions, comments or feedback, please contact: EDGE@aemo.com.au



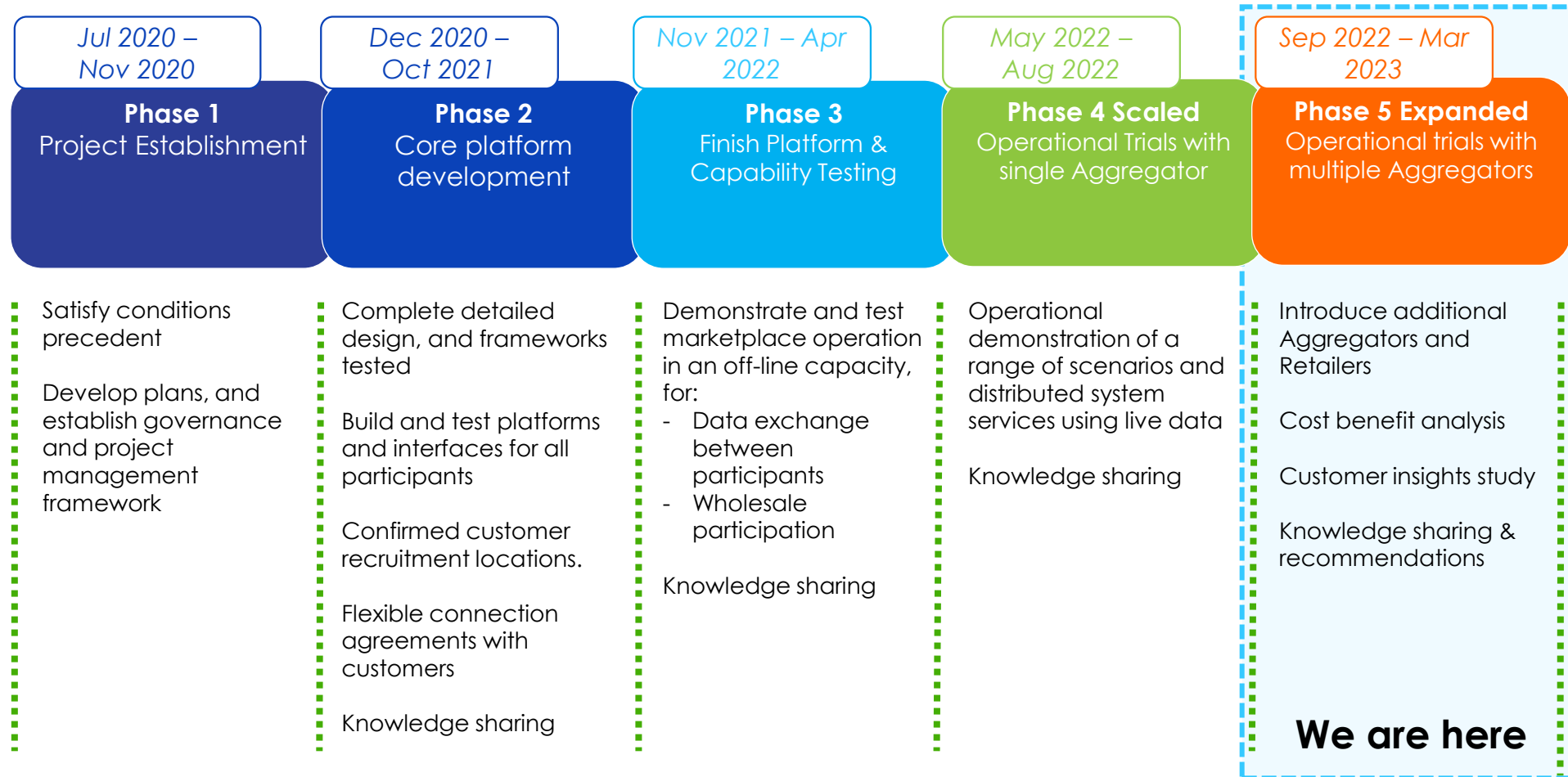
Thank you!

Appendix

Project EDGE | Timeline

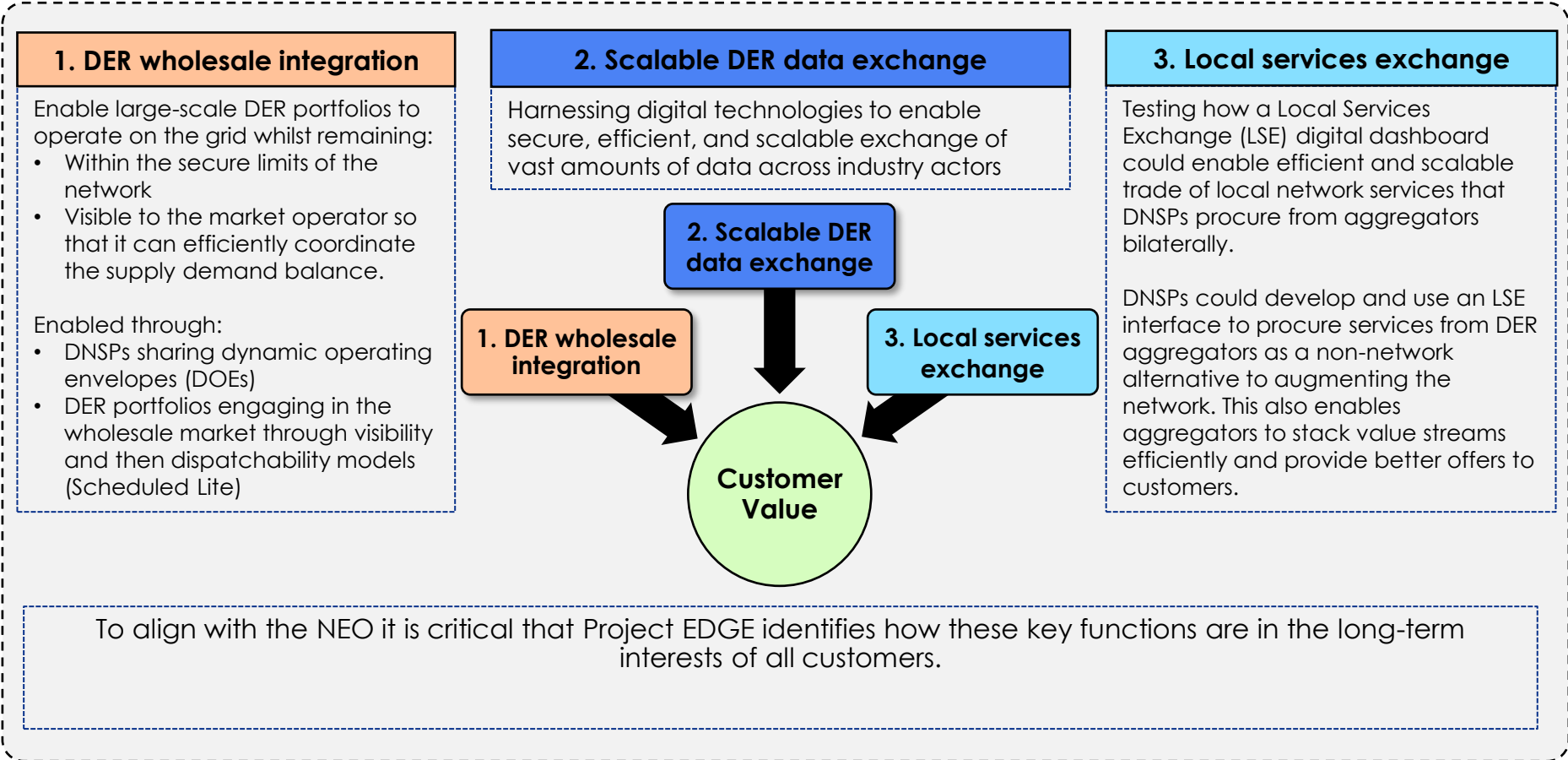
Based in Hume region of Victoria

Five Phases, from July 2020 – March 2023



Project EDGE will test the core functions of a digitised, decentralised power system and market

Project EDGE will test the three key function sets that are vital elements of efficient and scalable DER integration, which are combined in Project EDGE in a concept called the DER Marketplace.

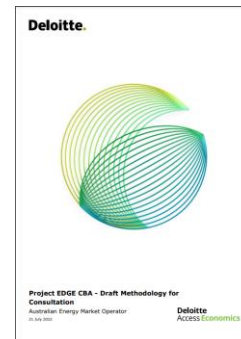


Project EDGE exists to provide evidence-based insights to benefit all customers.



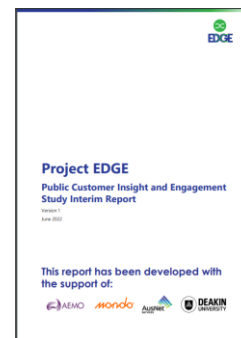
Research Plan

A detailed research plan has been developed by the University of Melbourne to guide the activities undertaken to ensure the data obtained supports the objectives of the project and can be used as part of an evidence base for change and development of the future energy market and systems.



Cost Benefit Analysis

The purpose of the CBA for Project EDGE is to identify and analyse whether the implementation of an operational DER marketplace is in the long-term interests of consumers consistent with the NEO. Deloitte Access Economics has been commissioned to conduct the CBA and will also assess under which scenarios adding more complexity and sophistication to the DER marketplace may be justified.



Customer Insights Study

Together with Deakin University, Project EDGE is running a multi-year consumer study that examines perceptions of, and decision-making around, Virtual Power Plants (VPPs) among potential residential and business customers, and current residential battery owners.

We have **three** key pillars that will inform policy decisions to provide value to industry and customers.

Evidence generated by Project EDGE is supporting the Energy Security Board's Market Reforms

- The Energy Security Board's (ESB's) Post 2025 National Electricity Market redesign identified that the change in energy consumers' behaviour provides a strong opportunity to develop a two-sided energy market.
- This would result in lower overall system costs for everyone, increase the efficiency of existing network assets, and optimise the utilisation of flexible loads and variable renewable energy.
- The evidence-based approach by Project EDGE will support recommendations that inform policy, regulatory and market decisions relating to reforms needed by industry to operationalise a two-sided market.

