Project EDGE
(Energy Demand & Generation Exchange)

Public Webinar #2 – Interim Report Highlights

June 2022

ARENA ACKNOWLEDGEMENT AND DISCLAIMER

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Acknowledgment of Country
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.

Housekeeping

Recording in progress

- This webinar will be recorded for the benefit of those who are unable to attend
- The recording and presentation will be available on the AEMO website

Questions and answers

- There will be an opportunity for questions at the end of the webinar

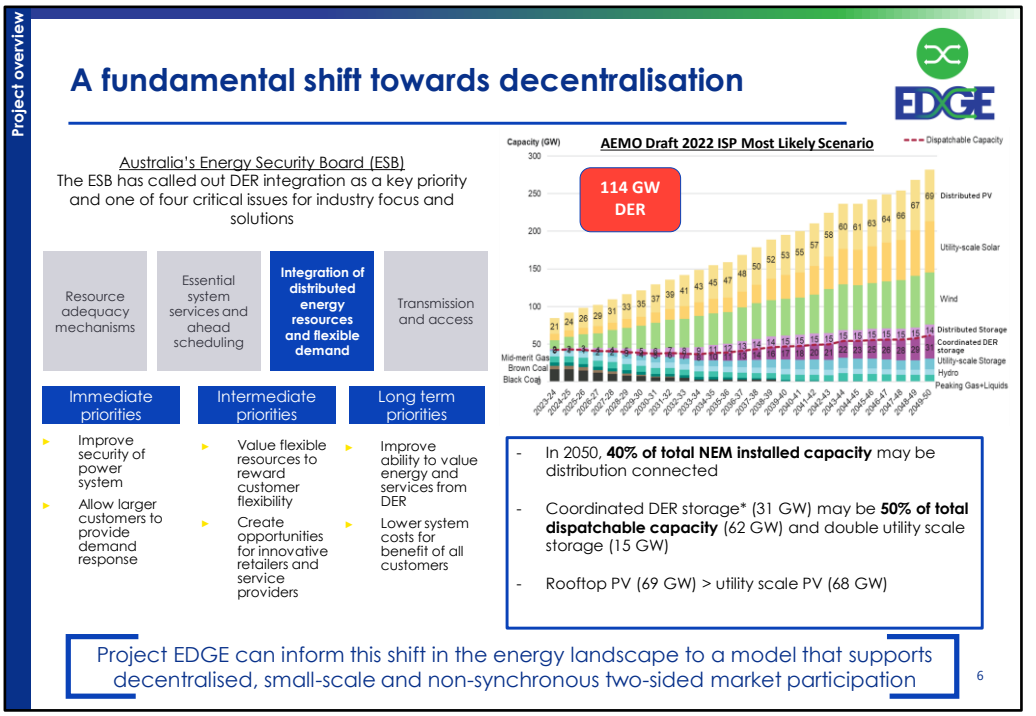
Agenda

Item
Project overview
Lessons learned
Focus: Data exchange
Independent CBA
Next steps for the project

Speakers:
Nick Regan – AEMO
John Theunissen – AusNet
Anoop Nambiar - Mondo

Great to be back with another public webinar sharing insights and thanks to everyone for joining today and Intro Team

- The purpose of this webinar is to share some of the highlights from the recently released Project Interim Knowledge Sharing Report.
- Interim report is a **significant project milestone, marking the transition from Design into field trial operation and evidence development**. It is an exciting time as the project has been supporting current reform with design thinking from implementing some of the industry reform concepts and now will compliment this with real world evidence from operating in practice.
- The interim report **contains a lot of design information, lessons learned and key questions for industry to solve together and for which EDGE hopes to support with some evidence over the next 12 months**
    - **THIS WEBINAR WILL OVERVIEW SOME OF THESE ASPECTS**
- To aid understanding a brief background will be provided today.
- The team have recorded previous webinars that provide further background and context on Project EDGE and can be accessed on the AEMO project site along with the interim report and other knowledge sharing documents:
- https://aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/der-demonstrations/project-edge/project-edge-news-and-knowledge-sharing



What is the context for Project EDGE?

The Australian energy sector is rapidly transitioning towards a de-centralised electricity system. A key driver is the strong uptake of DER, such as rooftop PV, by consumers. Distributed solar now collectively represents the largest generator of electricity in the NEM.

AEMO's draft 2022 Integrated System Plan's (ISP) most likely Step Change scenario projects NEM capacity in 2050 to be over 280GW, of which 114 GW (40%) would be connected to the distribution network[1].

Under the Step Change scenario, there could be times when the entire NEM demand for electricity may be met with distributed connected resources.

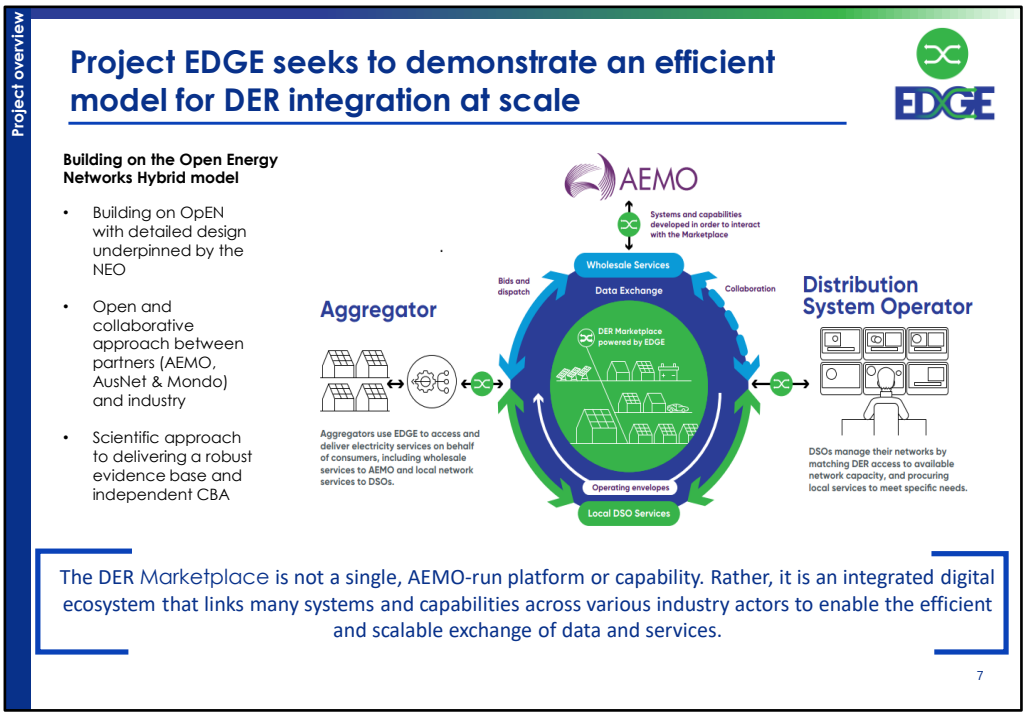
- The NEM and WEM are already experiencing challenges operating the system securely due to **passive** DER behaviour e.g universally exporting energy into the grid in the middle of the day causing record minimum system load sizes.
- In accordance with the Finkel review and ESB NEM2025 DER Implementation plan, the industry is working to integrate DER into the power system and markets so that it can become more '**active**', responding to price signals that **incentivise**

different behaviour to support grid security, greater variable renewable penetration and greater value for consumers.

- Project EDGE is supporting this industry reform effort by testing in practice a scalable DER marketplace aligned to the reform initiatives and delivering an evidence base to from which to shape these reforms.

THOUGH THIS

Project EDGE can inform this shift in the energy landscape to a model that supports decentralised, small-scale and non-synchronous two-sided market participation



Project EDGE (Energy Demand and Generation Exchange) is an innovative, first of its kind, collaboration between the Australian Energy Market Operator (AEMO), AusNet Services (AusNet) and Mondo (collectively, the Project Partners), with financial support from the Australian Renewable Energy Agency (ARENA).

Project EDGE seeks to understand, test, and demonstrate a proof-of-concept Distributed Energy Resources (DER) Marketplace that enables efficient and secure coordination of aggregated DER to provide wholesale and local network services within the constraints of the distribution network. The field trial is deliberately smaller-scale and off-market so that project experimentation doesn't interfere with live energy markets.

Building on Open Energy Networks (OpEN)'s Hybrid model

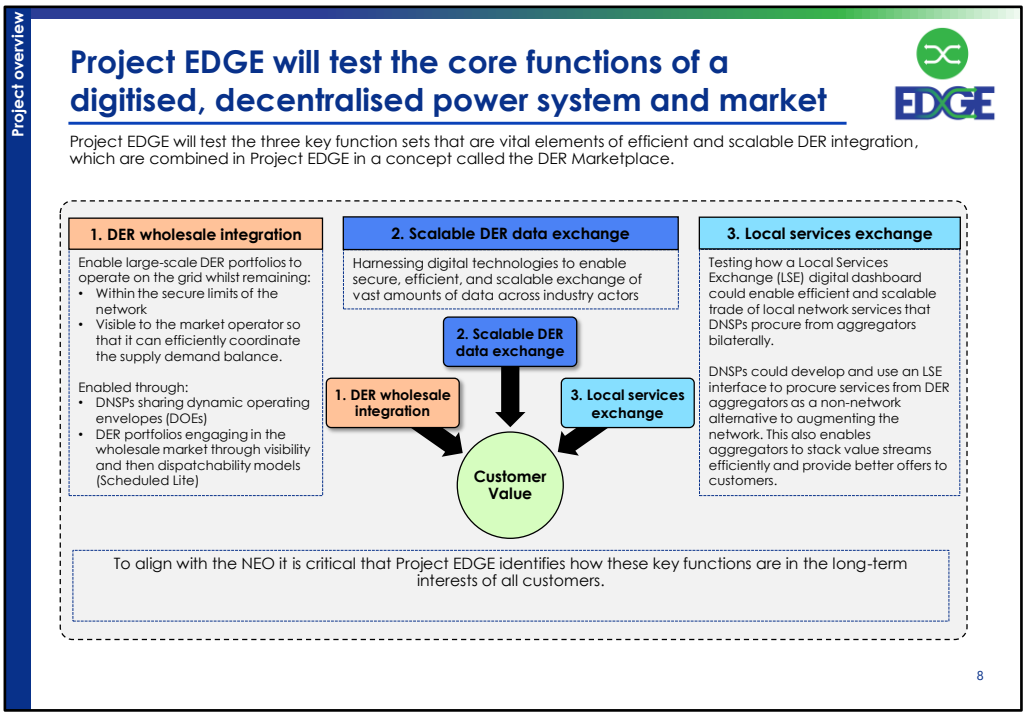
While the DER Marketplace builds on the Open Energy Networks Project's Hybrid model, the detailed design was underpinned by the National Electricity Objective (NEO). The Hybrid model was identified as the most appropriate framework for building a two-side marketplace[2], in which market operation functions are allocated to AEMO and DNSPs optimise the distribution system operation.

promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

price, quality, safety and reliability and security of supply

ROLES & FUNCTION SETS, Cust Champion, Current Role, DSO

Project EDGE is taking a scientific approach to developing a robust evidence base that can be trusted by government, industry and the community. Key elements of this approach include the development of a Research Plan, a cost benefit analysis (CBA) and regular knowledge sharing and stakeholder engagement and dedicated customer insights study run by Deakin, who also released a report for.



DER wholesale integration function

Project EDGE will test how to enable large-scale DER portfolios to operate on the grid whilst remaining:

- Within the secure limits of the network
- Visible to the market operator so that it can efficiently coordinate the supply demand balance.

This could be enabled through:

- DNSPs sharing dynamic operating envelopes to ensure DER operate within local network limits
- DER portfolios first providing visibility to the market operator, then participating in the NEM dispatch process.

Scalable DER data exchange function

Project EDGE will test how to best harness digital technologies to enable secure, efficient, and scalable ways to exchange vast amounts of data between industry participants to facilitate DER service delivery.

Local services exchange function

Project EDGE is testing how a Local Services Exchange (LSE) digital dashboard could

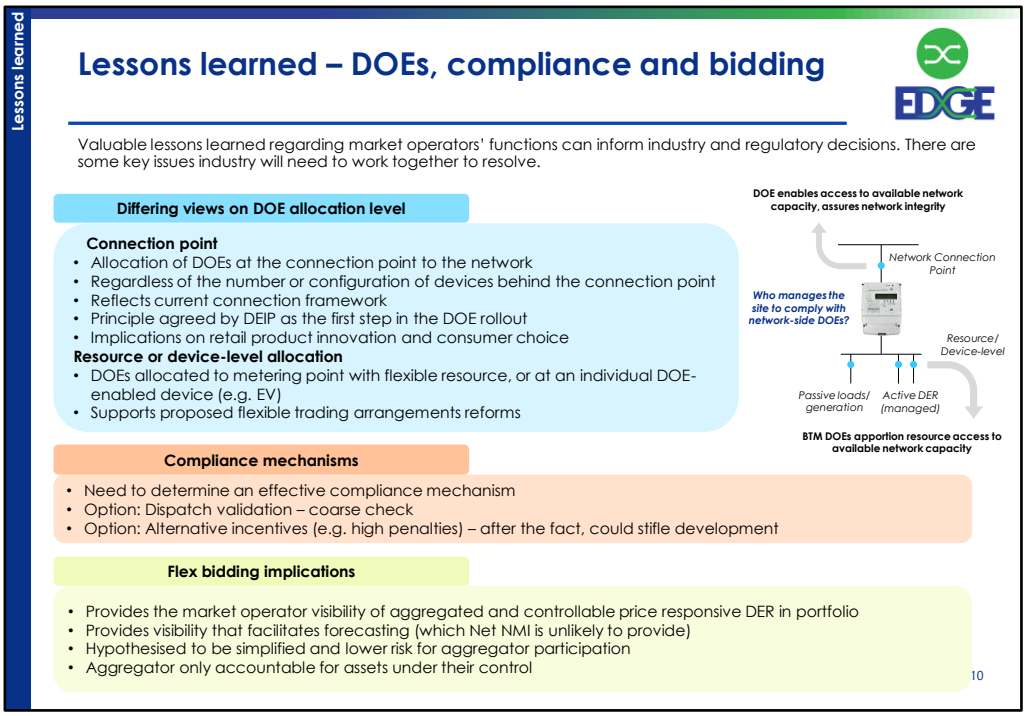
enable efficient and scalable trade of local network services that DNSPs procure from aggregators bilaterally.

DNSPs could develop and use an LSE interface to procure services from DER aggregators as a non-network alternative to augmenting the network. This also enables aggregators to stack value streams efficiently and provide better offers to customers.

LT value to consumers

Simplifying aggregator user experiences enables them to offer a more simple and compelling value proposition to customers. If wholesale/local services are defined consistently and are easy to deliver across DNSP jurisdictions, then aggregators will be able to develop customer incentives that promote greater DER activation.

Lessons learned



DOE allocation

- **Connection point allocation** complements existing connection framework – DOEs are enabled by customer-network connection agreements
- DOEs are calculated so as to ensure network integrity and power quality for customers is maintained.
- Considers overall operation of all generation and load behind the connection point complies with export and import limits set by DSO.
- **Resource or device-level allocation** requires a knowledge of BTM measurement data pertaining to passive and active loads for calculation, and would support DOE allocation at sub-NMI metering point with flexible resources or next level of granularity – individual DOE-enabled devices (e.g. EV).
- Proposed reforms could see customer with multiple meters or connection points at a single site.
- These reforms facilitate separating flexible from inflexible generation or load and introduce added complexities in relation to how the available network capacity is allocated at a flexible resource level where there are multiple traders involved.

- **Differing views:**
- Concerns about connection point allocation's implications on consumer choice and product innovation arise since it doesn't take into account the number of

devices or their configuration behind the connection point.
- As market reforms facilitate alternative arrangements, DOE allocation that doesn't consider number or configuration of devices may lead to different preferences among industry.
- Network may continue to favour connection point allocation since it maintains a consistent risk position around network integrity, aligns with the current connection framework, and device-level allocation is more complex to implement. Additionally, there is a view that there will always need to be a role for a "site manager" for connections with active resources to ensure network and customer power quality is managed.
- Aggregators may prefer resources or device-level since it supports new business models enables by the flexible trading arrangements.

Compliance mechanisms
- Current: AEMO operates a Security Constrained Economic Dispatch (SCED)
- Market actors' bids (MW) cannot be dispatched outside of the transmission network constraint under which they operate.
- AEMO calculates constraints based on input from TNSPs and dispatches the most economic bids underneath, partially dispatching a bid if required.

- **Dispatch validation:** aggregated DOEs for an aggregator's portfolio versus wholesale bids received. Bids are constrained down to within aggregated DOE quantity if they exceed.
- **Risks:**
- Done at portfolio-level (aggregation of all NMIs) – coarse check, cannot determine if individual NMI DOE limits breached – this would only be able to be achieved ex-post via smart meter historical PQ data.
- Would only be able to check the thermal net load/generation at the aggregated level and does not consider binding voltage constraints within the local networks.
- If DOE is Net NMI and Bid is Flex, real-time validation only possible ex-post. This requires trust aggregators bid within their DOEs and DOE compliance incentives are enough to ensure system security.
- At high wholesale prices, aggregators could export beyond DOE for commercial benefit.

- **Alternative mechanisms:** (such as high penalties for non-compliance evaluated ex-post)
- **Risks:**
- Enforcement could stifle development of nascent market

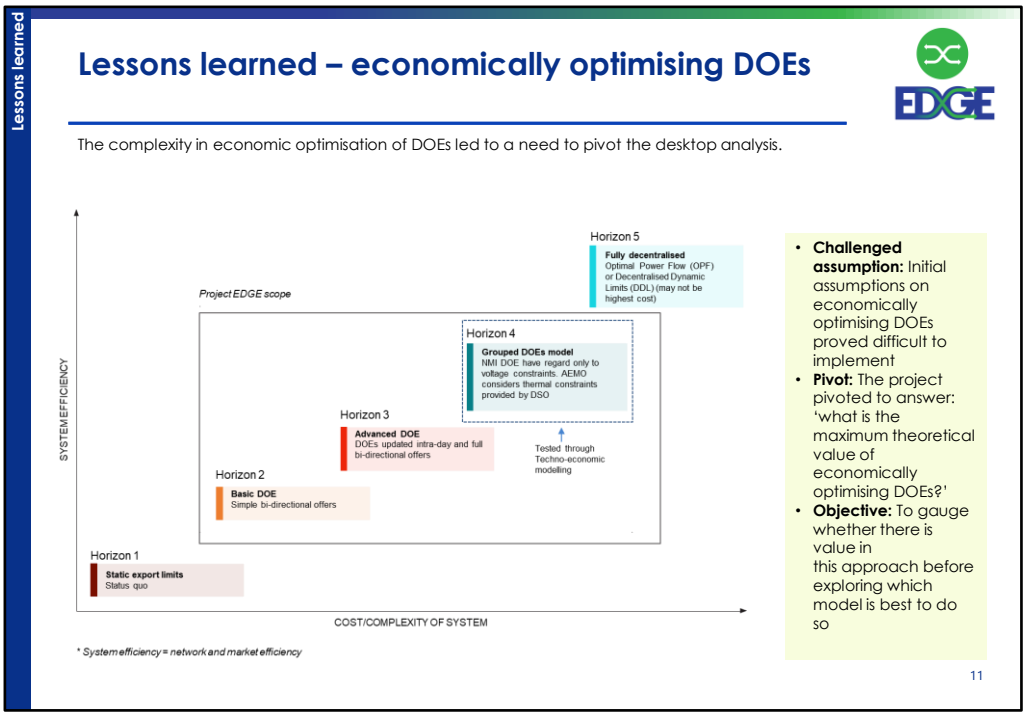
Flex bidding implications:
- **Flex Only bidding:** measured at a common measurement point behind the meter – representing the aggregation of all controllable DER assets at a site – and aggregated across the aggregator's portfolio. Flex Only ignores uncontrollable customer load and generation at a site

- **Net Connection Point Flow (Net NMI):** measured at the connection point (NMI-level) and aggregated across the aggregator's portfolio, including both controllable and uncontrollable generation and load.

- **Hypothesis Flex bidding:**
- Provides the market operator visibility of only the aggregated controllable price responsive DER assets in an aggregator's portfolio
- Hypothesised to provide the aggregator with a simplified lower risk means of participating in wholesale energy dispatch and assumes that the risks to network integrity can be managed.

- **The visibility provided by Flex** is important.
- Price responsive DER is extremely difficult to forecast for AEMO compared with the aggregator who has data feeds directly from their customers' DER and understand their own price triggers.
- **Compared to Net NMI**, which is unlikely to provide clear visibility of the portion of the load pertaining to controllable DER devices

- **Implications for aggregator:** Flex bidding means they are accountable only for the assets under their control whilst Net NMI bidding exposes their service delivery and dispatch compliance to the risk of mis-forecasting the customer's uncontrolled load/generation at a site.



Economically optimising DOEs:

- During high-level design, the project assumed the calculation of DOEs could be done in a way that economically optimised their capacity allocation among NMIs based on comparing aggregators' bids.
- Through detailed design it was apparent that aggregator bids supplied at a whole-of-fleet-level (DUID) would not provide the granularity of information required for NMI-level DOE calculations.
    - Alternative models where aggregators supplied NMI-level bids were deemed costly for aggregators and therefore have scalability challenges so were not pursued.
    - Recognising that in theory, DOE capacity could be economically optimised through either DNSP DOE calculations or independent market mechanisms such as ahead or secondary markets, the project pivoted to attempt to answer the question 'what is the maximum theoretical value of economically optimising DOEs?'.
    - This will gauge whether this approach should be pursued, before exploring which model is best to do so.
    - This analysis will be conducted using a desktop study based on field trial

data at the individual NMI level.

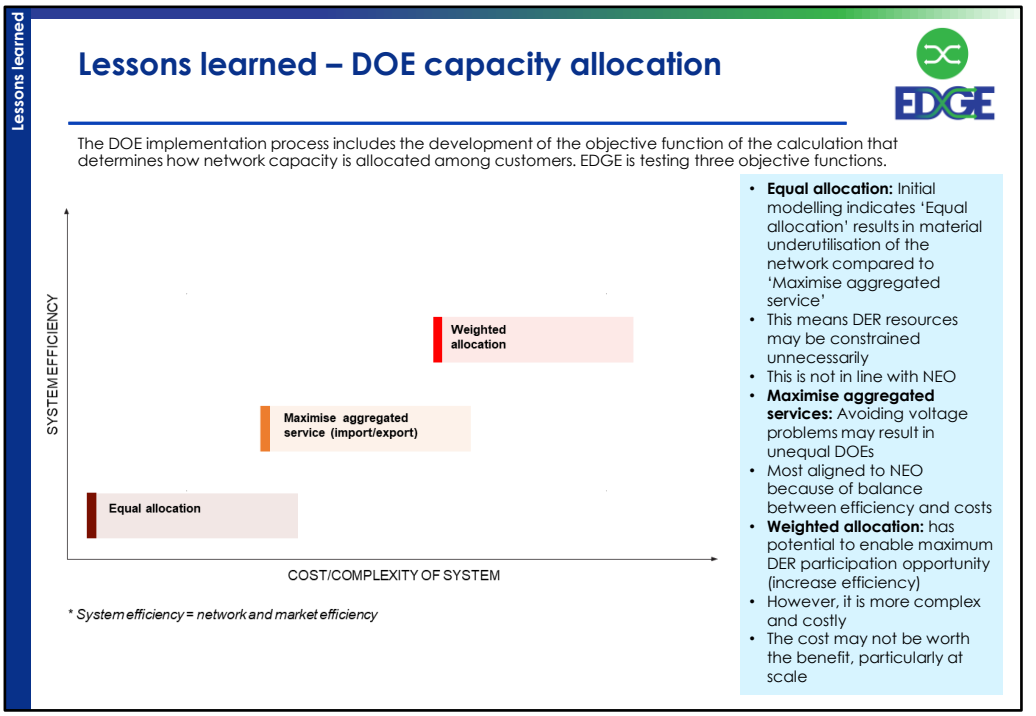
Spectrum of approaches:

- Project EDGE is exploring a spectrum of approaches that span a simplicity-efficiency trade-off continuum, from relatively simple and lower cost to implement, but relatively inefficient, to more complex, higher cost to implement and more efficient.
- Efficiency refers to both the level of market efficiency and the level of network utilisation (that is, how close to the true network limits can the market securely operate).

- **Basic DOE marketplace:** The initial stages of the project and marketplace operation will be to test the basic application of DOEs in an off-market wholesale dispatch process.

- **Advanced DOEs:** In the field trial an Advanced DOEs model will test more frequent DOE calculations on the trading day leading up to the dispatch interval and sophisticated aggregator bidding.

- **Grouped DOEs and alternative capacity allocation methods:** Desktop studies will assess impacts from an increase in complexity in line with the simplicity-efficiency trade-off. These desktop studies will assess the Grouped DOEs Model and whether there is value in pursuing economic optimisation within the DOE calculation. In addition, a separate desk-top study will examine an alternative "capacity optimisation" where DOEs are influenced by the max/min levels of DER capacity available at the NMI level during that market interval (or as forecast) so that available network capacity is not wasted on network connections where it cannot be used.
- The Grouped DOEs Model introduces separate thermal capacity limits for a given network node provided by the DNSP and represented by a group of NMIs.
- Aggregators bid 'unconstrained' and dispatch instructions are produced through a grouped-level security constrained economic dispatch process to maximise the economic efficiency and utilisation of the network.



Three objective functions have been incorporated into the current design:

- Equal Allocation.
- Maximise Service (Import/Export).
- Weighted Allocation.

These objective functions will be used within the field trials to test and identify the most optimal trade-off between complexity and market efficiency.

Objective Function 1: Maximise aggregated services

- This objective function aims to maximise the total volume of exports/imports from active customers. Fairness considerations are not incorporated. As a result, customers at the end of the feeder may end up with reduced DOE (to avoid voltage problems) while those at the head of the feeder will be able to receive larger DOEs.

Objective Function 2: Equal opportunity

- This objective function aims to ensure a **fair allocation** of network capacity among multiple active customers. That is, each customer is allocated with the

same DOE.

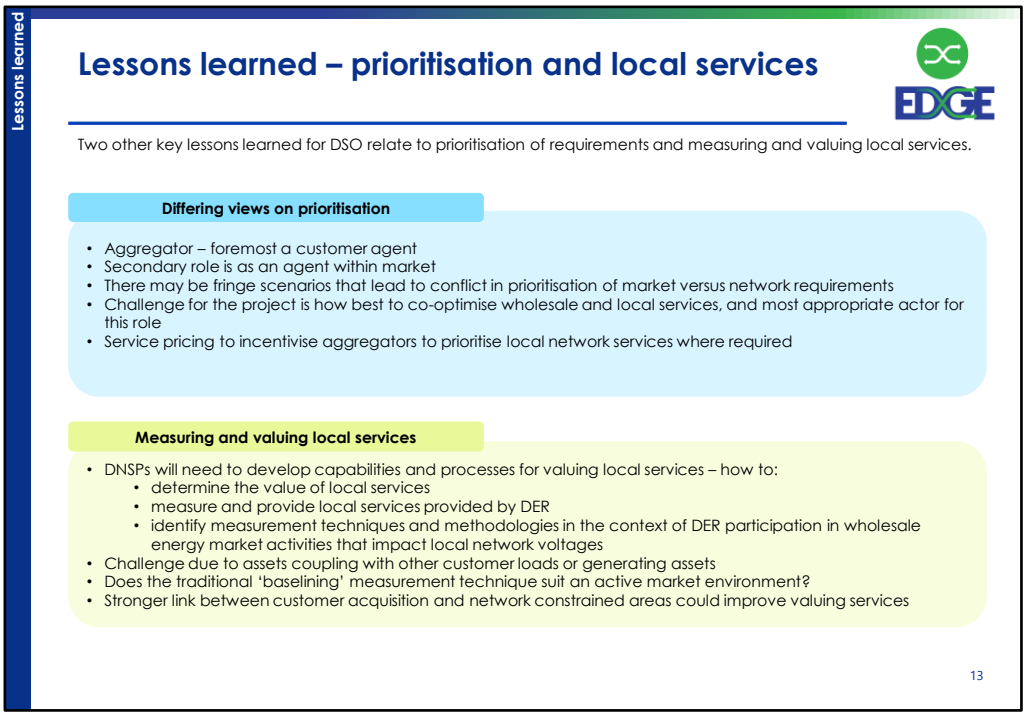
- This can be done either in absolute kW/kvar or proportional to installed DER capacity.
- While fairness is guaranteed, depending on how sensitive customers at the end of the feeder are to voltage issues, the individual DOE can be very small. This results in a lower aggregated DOE when compared with Objective Function 1.
- Results in material underutilisation of network compared to 'maximise aggregated services'.
- Constraining DER when they don't need to be can have a negative impact for all consumers – does not appear to promote NEO to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to: price, quality, safety and reliability and security of supply of electricity.

Objective Function 3: Weighted allocation

- This is an extension based on Objective Function 1 where individual weighting factors are applied to each active customer. The weighting factors can be adapted depending on the specific scenario to reflect the priorities of stakeholders. For instance, they can be used to reflect the price of exports from each active customer in order to ensure the least cost.
- **A clear finding** from the modelling work undertaken so far in the project is that the 'Equal Allocation' objective function results in material underutilisation of the available network capacity for DER when compared with the 'Maximise Service' objective function.
- In a practical sense this means that DER resources are being constrained when they do not need to be, and this can have a negative economic impact for all consumers.
- **The 'Weighted allocation' objective function has the potential to enable maximum opportunity for DER assets** to participate in a DER Marketplace because the level of customer DER access to available network operational capacity is more reflective of the point at which the DER is connected to the network.
- Widespread availability of smart meter analogue measurements in Victoria enable a more accurate assessment of power quality conditions in the LV networks.
- Hypothesised to increase market efficiency by 'weighting' the allocation of import/export capacity towards more economically competitive DER.
- However, projected to involve considerable complexity and cost to operationalise.
- The cost may not be worth the benefit, particularly when the costs associated

with scale are considered.

- **Accordingly, the lessons learned indicate a hypothesis that 'maximise aggregated service' is the most aligned with the NEO.**
- Because it does not constrain DER unnecessarily and optimises the use of the network without imposing the additional costs incurred by weighted allocation.



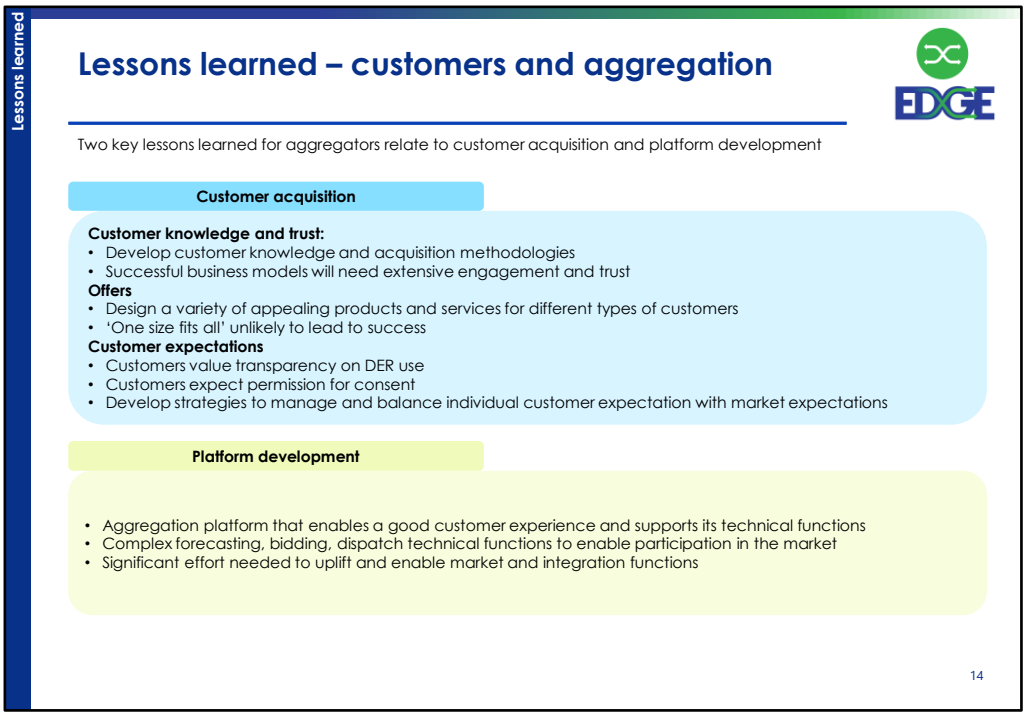
Prioritisation

- The aggregator role will be, foremost, as an agent for the end customer.
- Its role as an agent within the market - delivering device instructions on behalf of DNSPs and retailers – will be secondary and this will be a key consideration when there is conflict between the two agency roles (customer agent and market agent).
- Hypothesised there could also be conflicting preferences with respect to market and network prioritisation.
- Hypothesised that aggregators, as market actors, will favour the market over network.
- Attention needs to be directed at how an over or under supply of local network services is managed and a need to resolve service prioritisation between local network services and the wholesale energy market.
- A challenge that Project EDGE will seek to inform is how to best co-optimise wholesale and local services and identifying the actor best suited to hold responsibility for this role and determining what services are prioritised.
- One approach to this co-optimisation challenge is to direct attention at service

pricing to incentivise aggregators to prioritise local network services where required.

Measuring and valuing local services

- DSOs need to develop the capabilities and processes for determining how to value and measure and verify local services provided by DER.
- Stakeholders identified challenges in how to measure and validate local service performance from aggregated DER.
- While there are established methodologies for valuing demand management services, the emerging introduction of voltage management services is not straight-forward.
- Especially within the context of DER participation in wholesale energy market activities which also impact local network voltages.
- **Challenge:** service provider's assets are coupled with other customer load consuming or generating assets and actions taken to provide the service can be affected by other customer activities.
- The service typically being provided and measured at an aggregate level.
- Traditionally managed by applying a baselining technique.
- Can a 'baselining' technique for measuring aggregated DER service delivery could be applied?
- May not be suitable for an active market environment.
- International jurisdictions moving towards direct measurement or verification of the aggregator actions in providing the service (i.e. specific measurement of the controlled assets).
- The risk of the passive customer load/generation behaviour then passes onto the DSO which in turn may require moderation of the quantum of local service provided.
- **Lessons learned for valuing local services**
- Due to the effort in setting up accurate network models, a stronger link between customer acquisition and network constrained areas is preferable to improve network modelling efficiency, maximise customer benefits and adequately answer the project's research questions on valuing services.



Aggregators:

Customer acquisition

- Customer perception and understanding of aggregated DER varies significantly.
- Their understanding of retail prices, tariffs and electricity market mechanisms is often limited.
- Successful customer acquisition will require extensive engagement and building of trust within target communities.
- Evidence suggests that engaging at a local level through installers and community groups active in the renewables and sustainability space can be highly effective.

Offers

- Designing aggregation products and services that appeal to the various residential and Commercial and Industrial (C&I) customer categories is challenging.
- The customer insights study commissioned as part of Project EDGE is intended to provide a better understanding of the needs, aspirations, and motivations of existing and intending DER customers.
- A 'one size fits all' approach is unlikely to work well.

Customer expectations

- Customers value clear and timely communication on how their DER devices will

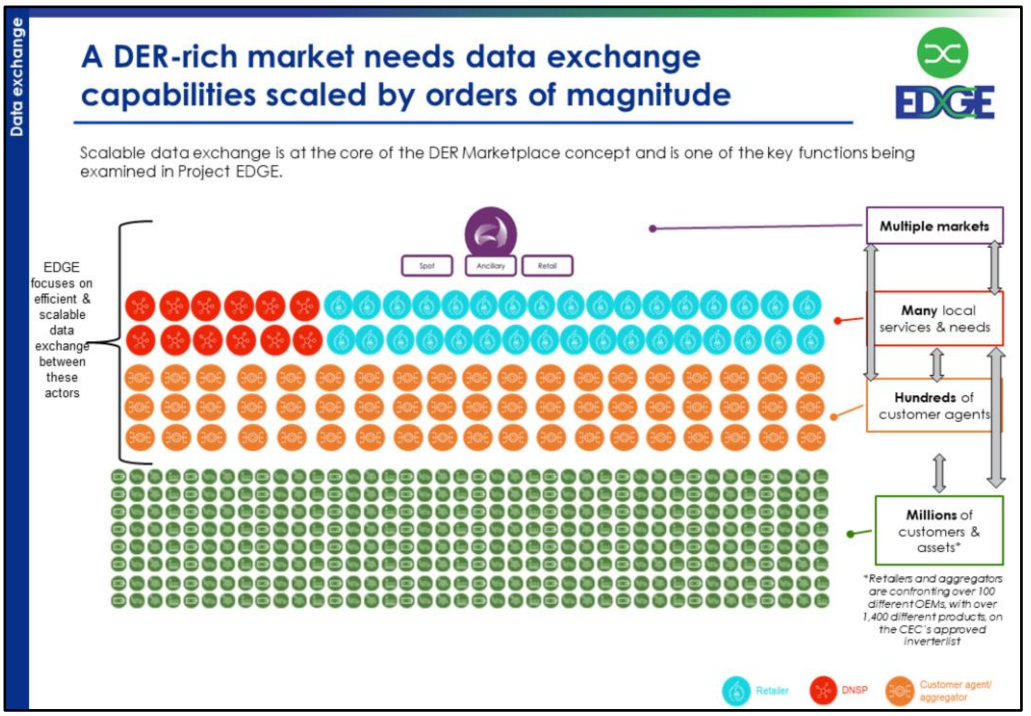
be used and how their needs will be prioritised.

- Customers also expect their aggregator will confirm consent where the customers have stated expectation.
- For example, not discharging their batteries below a predefined threshold or limiting the charge and discharge cycles that their battery assets undergo over a period.
- Any real market implementation of the arrangements trialled within Project EDGE will need to balance the individual expectations of the DER owners with the market expectations from the use of that DER to provide services

Aggregation platform

- Aggregators will need to implement an aggregation platform that provides a good experience for DER customers while also supporting the complex forecasting, bidding and disaggregated dispatch functionality required to participate in a two-sided DER market.
- Even where an aggregator has an existing platform, Mondo's experience is that significant effort is required to implement the market functions and central integration to the market operator platform.

Focus topic: Data exchange



- Currently the NEM has more than 200 large generators and around 9M customer connection points.
- This diagram is to give an idea of the scale of the data exchange challenges that sit behind that DER uptake curve and integrating 'active' DER.
- New DER specific use cases and provision of services
- Industry actor level where many hundred more may exist in the future

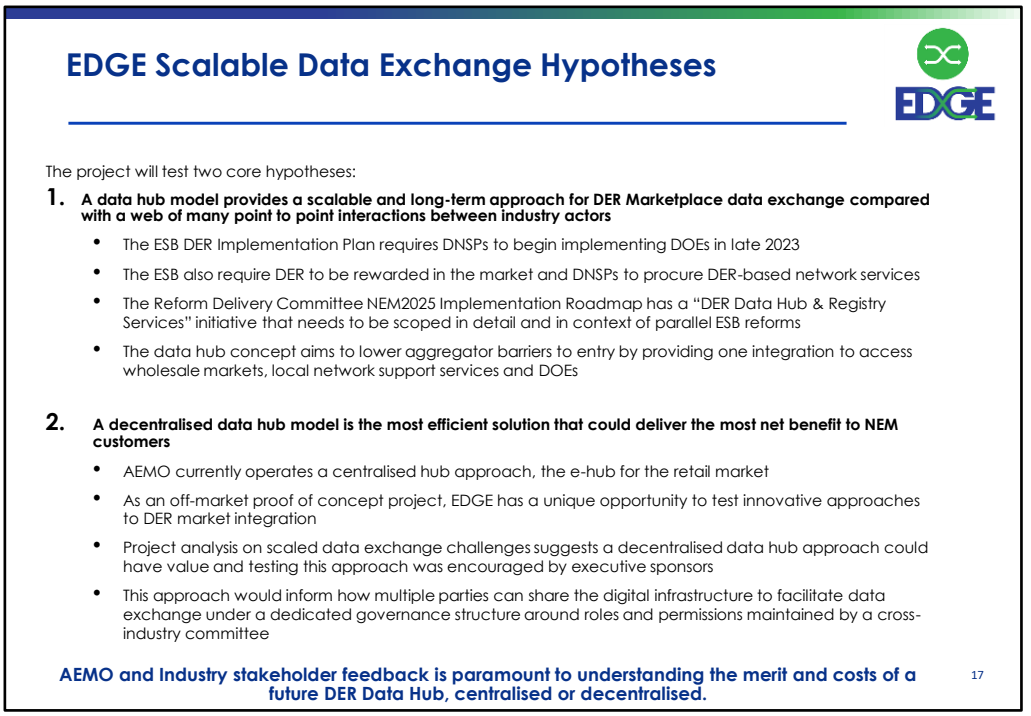
With the exponentially greater number of participants, markets, services, and especially devices, a DER rich landscape means industry must consider the **basic challenges** like:

- **Establishing & maintaining relationships** between customers, devices, and participants for processes like service enrolment, registration, and facilitating customer / device churn
- **Scaling to handle the volume of data** (and storage) being exchanged across all markets and participants (and ensuring for performance, maintenance, security, and resilience)
- **Managing communication, credentials and integrations** between all market participants (and relevant 3rd parties like "agents" who can control the output of

solar PV

- The components of Project EDGE have been to test of a DER marketplace can scale to accommodate a high DER future consistent with the ISP ‘Step Change’ scenario where many hundreds of additional market participants, bi-directional nature orchestrate millions of small scale customers owned devices that in unison will be the largest generator and load in the NEM.
- The integration of these DER and their representative market participants (called ‘aggregators’) into the system and markets so they can be ‘actively’ orchestrated will require an exponential volume of data to be exchanged, stored and verified.

- The systems and processes grid operators (wholesale and distribution) use to register, qualify, and communicate with generation assets today need to scale by a factor of 2-3 orders of magnitude, to an increasingly diverse class of asset types. Or conversely, the “unit cost” (in terms of time and operating expense) of enrolling and operating an asset in the market needs to be reduced by at least 1000x.
- Operational data: Scalable, reliable, secure and affordable systems will be required to transfer data from millions of distribution connected devices into operational control systems, most likely at varying levels of aggregation. To ensure affordability, alternatives to SCADA systems will need to be explored.
- Network limit and constraint data: In future, distribution network limits will need to be considered in the operational timeframe, with DNSPs sending limits to DER operators (such as aggregators) to ensure that millions of distributed devices collectively operate within secure network limits.

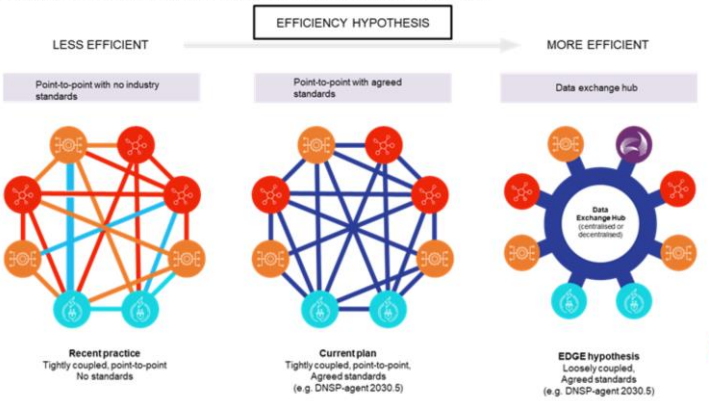


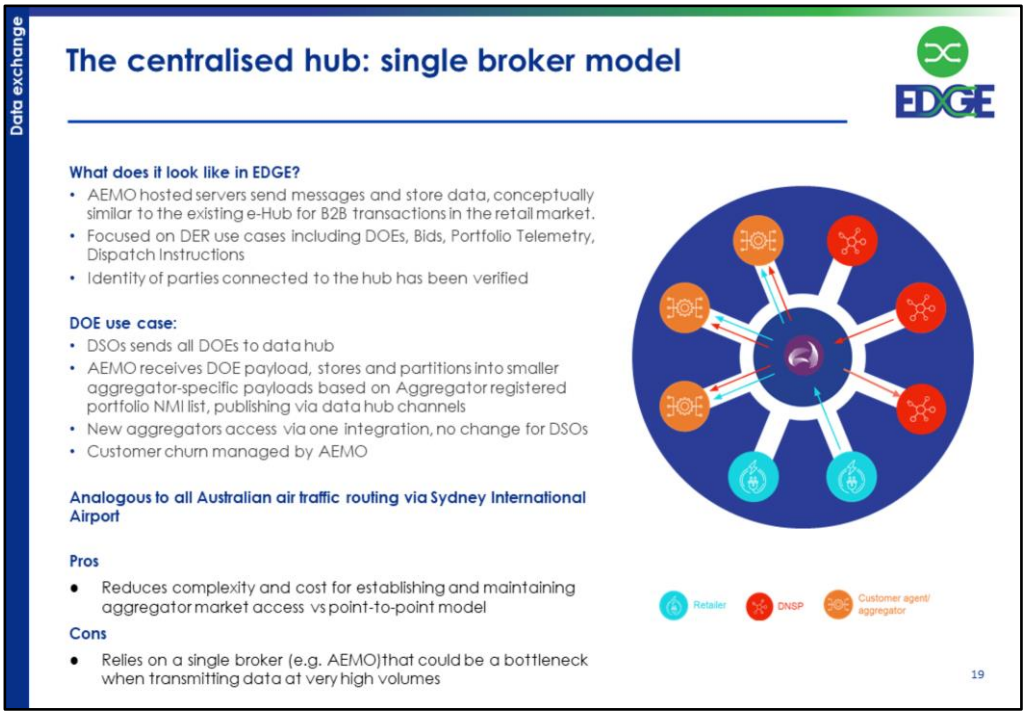
Through its Proof Of Concept data exchange infrastructure, Project EDGE will support the understanding of requirements for a future production grade system in line with the NEM2025 Implementation Roadmap initiative “DER Data Hub & Registry Services”.

There are different approaches to data exchange that cover a hypothesised spectrum of efficiency

There is a spectrum of approaches to exchange data among many parties, including:

- **Point-to-point with no industry standards** – individual connections to share data with no preferred methods/protocols
- **Point-to-point with standards** – individual connections to share data with agreed preferred methods/protocols
- **Data exchange hub** – connect once to a data exchange hub to share data with all parties. Project EDGE will consider both a centralised and a decentralised hub approach





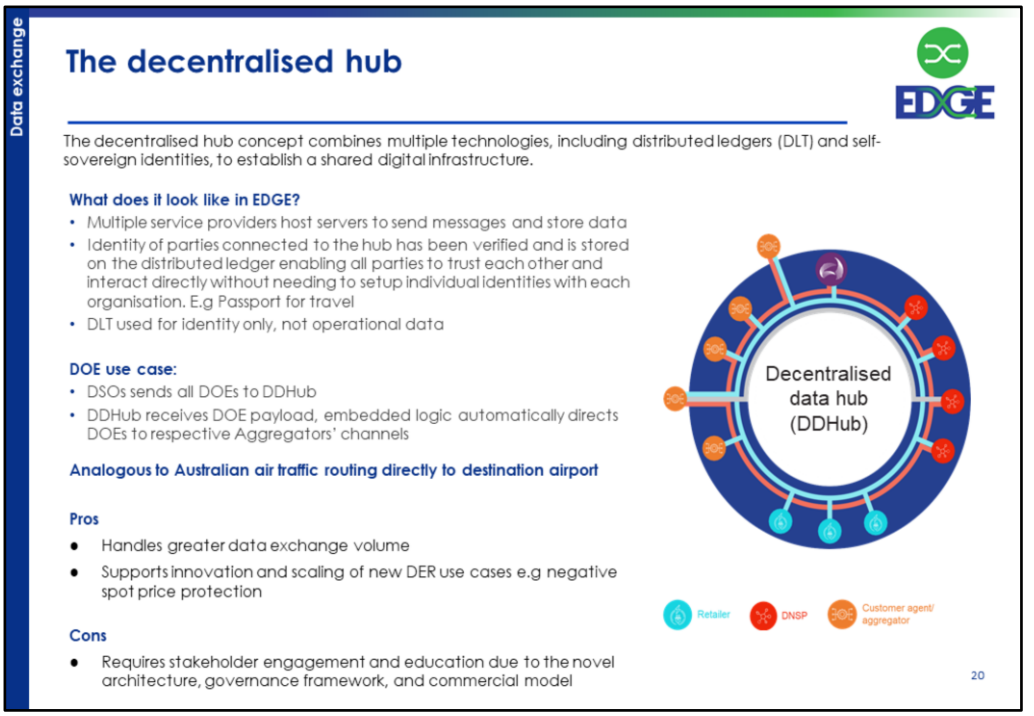
Pros

- Reduces complexity & cost by reducing number of integrations
- Standardises rule-based logic for data exchange
- Simplifies reporting, reconciliation, & incident management
- Easier to coordinate & perform maintenance / system updates over time
- Protocol agnostic: any communication protocol or standard can be utilised without rigid hardware requirements

Cons

- Relies on a single broker (e.g. AEMO) to operate infrastructure & manage access permissions credentials for all parties
    - Each transaction is “touched” by 3 parties (sender, broker, recipient)
- Broker is responsible for storing all data from all participants, and directing messages to the correct recipient(s)
- Broker could be single point of failure (a failure in the hub can be a bottleneck for multiple processes & organisations)
- Risk of vendor lock-in if implementation specs. are too rigid

- Restricts innovation (eg. to enable independent Local Services Exchanges)



Hub now doesn't have a central point, a ring shape

The decentralised hub removes a central broker and represents shared digital infrastructure where multiple parties host nodes that provide the data exchange infrastructure services. Data is stored by participants and storage service providers. Data is accessed based upon role permissions and verifiable credentials associated with digital identities connected to a single source of truth (distributed ledger).

The dark ring represents the decentralised hub (DD-Hub) and the circles within the ring represent participants hosting nodes that facilitate the DD-Hub. Circles outside the ring but connected to it represent participants that are integrated with the hub but are not hosting the shared digital infrastructure. Hosting rights and responsibilities can be defined in the DD-Hub Governance framework.

Pros - All the benefits of a centralised approach, plus:

- **Flexible service provision and resilience:** Participants can host independent "nodes" or subscribe to existing ones, while distributing infrastructure eliminates single points of failure
- **Dedicated channels:** Participants can configure data exchange with many

(broadcasts), or directly (unicast messages)

- **Self-managed identity:** Each participant manages their own identity and credentials
- **Shared governance:** Rules, roles, and responsibilities are defined via industry governance and enforced in code
- **Innovation potential:** Participants can build custom apps on top of shared infra, and new use cases (eg. retailers message 3rd party PV "agents") can be established, building value for the market

Cons

- Requires stakeholder engagement and education due to the novel architecture, governance framework, and commercial model
- Similar to cloud computing in mid-2000's, some components are proven in limited settings but require further testing in the energy/enterprise setting
- Requires build-out of service nodes
- Establishing the governance of this digital infrastructure model would require industry collaboration and consultation to determine the appropriate roles, access and capabilities required. For example, the governance framework for the e-Hub, which facilitates business-to-business (B2B) data exchange in the retail market, established the Information Exchange Committee as an independent statutory body under the NER that is responsible for developing and making recommendations on changing B2B Procedures.

At https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/information-exchange-committee

Governance

Would require industry collaboration and consultation to determine the appropriate roles, access and capabilities required to manage multiple infrastructure service providers and owners.

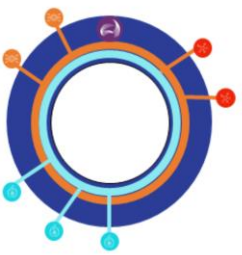
The EDGE infra is designed to progressively evolve operation and governance

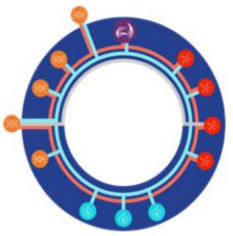
The DDHub can start by being hosted by a single provider (eg. AEMO), with a few participants "subscribing" to integrate. Over time, participants elect to host infrastructure (or continue to subscribe) and develop additional use cases and independent applications

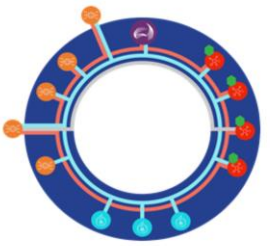
Establishment:
- Single provider (incurs all costs and receives all payments)
- Few subscribers

Consolidation:
- Multiple service providers
- Multiple subscribers
- Few use cases

Growth:
- Competitive service provision
- Many subscribers
- Multiple use cases
- Growing "app exchange" of independent solutions

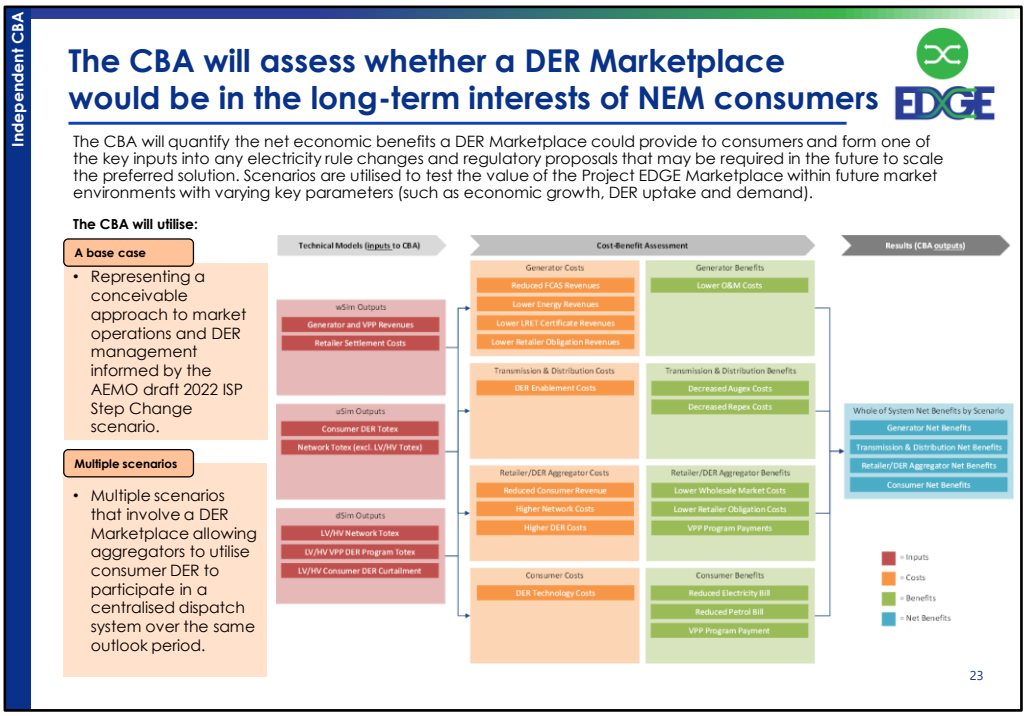






Customer agent/ aggregator | DSO | Retailer | AEMO

Independent CBA



- Base case: Additional assumptions will be developed through internal and external stakeholder consultation.
- Multiple scenarios: In addition to considering the wholesale integration of DER, additional scenarios will cover data exchange functions and LSE functions and variation in DER penetration.
- If it proves to be in the long-term interests of electricity consumers in line with the NEO, the CBA will also assess under which scenarios it may be justified to add more complexity and sophistication to the DER Marketplace. For example, how distribution network limits should be considered in wholesale dispatch and how DER participation in central dispatch should be progressively achieved.
- Techno-economic modelling (TEM) will provide outputs under varying scenarios which feed into the CBA. Costs or benefits not directly captured by the TEM but material to testing of the research hypotheses will be further investigated and methods will be determined to quantify the impact and feed into the CBA.
- Outcomes from the CBA will inform and test the research questions and hypotheses in the Research Plan.

Next steps for the project

Operational trial (phase 4)
Online testing of different functions and scenarios with a single aggregator (Mondo). This will use Mondo's real-world DER fleet dispatch using live market price data from AEMO's enterprise database

Operational trial with multiple aggregators (phase 5)
New aggregators (at least two, one of which will be a licensed energy retailer) will be introduced to test DER Marketplace functionality using near real-time price signals from the wholesale market.

Questions & contact

EDGE@aemo.com.au

For further information for Project EDGE, please visit:
https://aemo.com.au/en/initiatives/major-programs/nem-distributed-energy-resources-der-program/der-demonstrations/project-edge