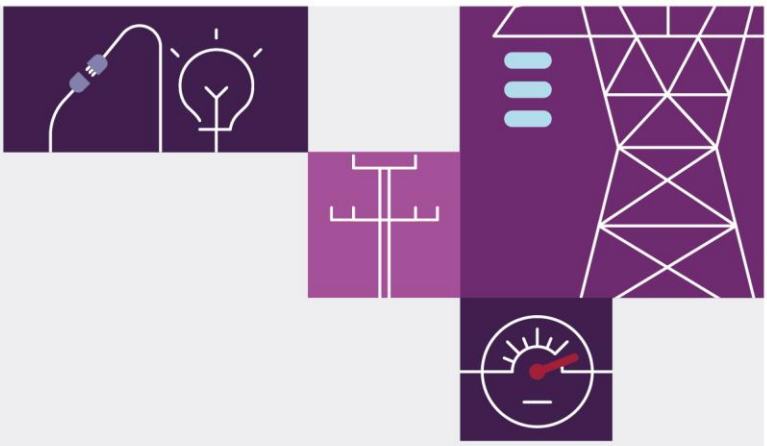
AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

CER Data Exchange Industry Co-Design

October 2024

Consultation Paper

A consultation paper to seek stakeholder preferences on a High-Level Design for a CER Data Exchange



Important notice

Purpose

The purpose of this publication is to outline a customer vision, guiding principles, stakeholder design preferences, use cases, governance structures and implementation strategies for a national CER Data Exchange. The aim is to seek feedback on the proposed design elements from a broader range of stakeholders, including those who have not yet participated in the co-design process.

Acknowledgements

AEMO would like to thank the many individuals and organisations who contributed time and expertise throughout 2024 through the project's Expert Working group, stakeholder meetings and workshops. Stakeholder contributions have informed the design proposals presented in this paper for a national CER Data Exchange.

Disclaimer

This document or the information in it may be subsequently updated or amended. This document does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Electricity Law, the National Electricity Rules, or any other applicable laws, procedures or policies. AEMO has made reasonable efforts to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this document; and
- are not liable (whether by reason of negligence or otherwise) for any statements or representations in this document, or any omissions from it, or for any use or reliance on the information in it.)

Copyright

We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.
AEMO Group is proud to have launched its first Reconciliation Action Plan in May 2024 (scan QR code to read).

Executive Summary

This consultation paper outlines a proposed framework for the development of a national Customer Energy Resource (CER) Data Exchange – a critical enabling digital infrastructure that will facilitate secure, standardised, and efficient data-sharing between organisations across Australia's evolving distributed energy landscape. As CER such as rooftop solar, batteries, and electric vehicles (EVs) become more prevalent, effective data management and coordination between various stakeholders is essential for realising the full benefits of CER for all consumers and to support Australia's transition to a decarbonised energy system.

The CER Data Exchange will support the scaling of CER flexibility by addressing the growing need for secure data exchange, improving operational transparency, and enabling market efficiencies by providing a robust and adaptable data sharing capability. It aims to empower consumers, improve the reliability of the National Electricity Market (NEM), and enable the market to make better-informed decisions that support grid stability and efficient energy use.

This consultation paper builds on the co-design process that has been undertaken since mid-2024. We are seeking feedback from a broad range of stakeholders to refine the proposed high-level design, governance and operational models of the CER Data Exchange. The objective is to ensure the exchange will benefit all consumers and meet future market needs, while aligning with Australia's long-term decarbonisation goals.

Purpose and Scope

The CER Data Exchange aims to establish a standardised, adaptable and secure data-sharing exchange that addresses the growing complexity of Australia's energy market. As CER uptake increases, a data sharing exchange is needed to foster streamlined data access and industry coordination of CER for consumers, networks, technology providers, aggregators and all industry participants. The CER Data Exchange is considered a vital component in achieving Australia's energy transition goals and is a National Reform Priority in the *National Consumer Energy Resources Roadmap*.

Stakeholders broadly supported the need for the CER Data Exchange at our workshops – recognising its potential importance to enabling industry participants to accelerate CER integration. We have explored different options and trade-offs to understand stakeholder preferences for the CER Data Exchange, including the following high-level design considerations:

- **Data Sharing and Operational Efficiency:** The exchange can provide consistent data-sharing between organisations. Improving data transparency and streamlining data exchange would enhance operational efficiencies across the market. There has been a clear stakeholder design preference for leaving responsibilities of data hosting and processing, to users where practical.
- **Consumer Empowerment:** Consumers would have greater choice, enabling them to participate in more value stacking opportunities and manage their energy use more effectively via their service providers. Stakeholders highlighted the importance of managing data privacy and security.
- **Support for Decarbonisation**: By integrating CER into the grid and promoting their flexibility more effectively, the CER Data Exchange can support Australia's broader decarbonisation goals – reducing the reliance on fossil-fuel generation and enabling a smoother transition to a renewable energy future.

Stakeholders were clear that while the exchange should be scalable to accommodate future technologies, it should not introduce unnecessary complexity.

This paper builds on stakeholder input to the co-design process to date and outlines the shortlisted exchange models, functionalities and governance frameworks, and invites broader stakeholder feedback to ensure the recommended high-level design and implementation plan to be developed in early 2025, align with consumer expectations, industry feedback and Australia's net-zero goals.

Co-Design Process and Stakeholder Engagement

The content for this consultation paper has been developed through a comprehensive co-design process, involving more than 170 stakeholders from across the energy industry. This collaborative effort has included market participants, government bodies, consumer advocates and subject matter experts – ensuring that the CER Data Exchange's design preferences reflect a broad spectrum of interests and operational needs. We have sought to be transparent, inclusive and actively engage with stakeholders to ensure the CER Data Exchange addresses real-world challenges, while balancing regulatory compliance, operational efficiency and consumer protection considerations.

The co-design process was structured around five workstreams:

1. **Need Drivers, Guiding Principles, and Design Preferences**: This workstream focused on defining the core value, data sharing infrastructure requirements, and guiding principles that the CER Data Exchange must meet, ensuring alignment with industry goals and consumer needs.
2. **Use Case Investigation**: Participants contributed to identifying real-world use cases that illustrate how the Exchange will function, helping clarify the role of the CER Data Exchange in supporting market activities such as CER and grid optimisation, flexibility service enablement, and consumer engagement.
3. **Ownership, Operation and Oversight**: Stakeholders explored various operation and ownership models, debating the merits of public versus private sector ownership, as well as assessing long-term regulatory oversight approach that would ensure alignment with the National Energy Objective.
4. **Data Governance**: This considers the frameworks for managing data security, access, and quality via the CER Data Exchange, ensuring that data is shared in a transparent, secure, and compliant manner while balancing the needs for flexibility and future scalability.
5. **Implementation Considerations**: An implementation roadmap and costing assessment of a preliminary high-level design, born from stakeholder input, will be considered in 2025. Stakeholders have expressed a clear preference for a phased implementation of the CER Data Exchange. Chapter 8 provides stakeholders an early opportunity to input implementation considerations to the next workstream of this co-design process.

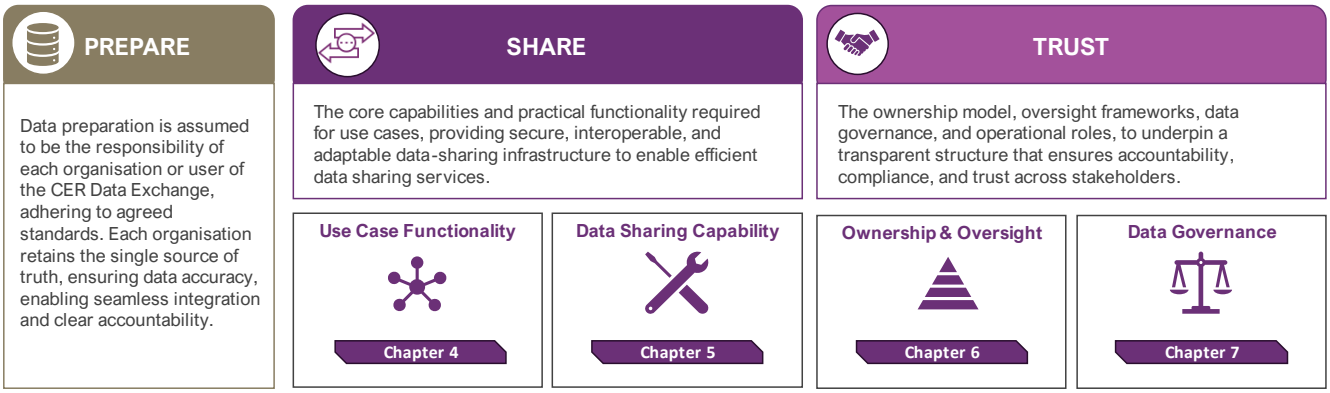
The project's distinct focus is on providing a robust and consistent mechanism for sharing and accessing data from multiple sources, enabling industry participants to retain control over data management while benefiting from streamlined exchange services. In doing so, the CER Data Exchange acts as an enabler rather than a controller, keeping its role distinct and simple yet effective.

Key insights from stakeholders

The following core themes have emerged from the stakeholder engagement process so far, which reflect the priorities and concerns of various market participants and will shape the ongoing development of the Exchange:

1. **Support for Improved Data-Sharing Infrastructure:** Stakeholders highlighted the need for an enhanced data-sharing infrastructure to better integrate CER. Data access and transparency were seen as crucial for improving future energy system efficiency and supporting consumer outcomes.
2. **Strong Preference to prioritise Quick-Win Use Cases:** Stakeholders expressed a desire for the early delivery of use cases that provide immediate operational benefits. There was broad agreement on adopting a phased approach, starting with high-priority use cases that offer immediate benefits.
3. **Support for Scalable and Trustworthy Governance Framework:** Stakeholders favoured governance and oversight models that can evolve with the market. Flexibility was a common theme, with participants highlighting the need to avoid excessive bureaucratic complexity that could delay the rollout or create barriers to participation for smaller market players.

The proposed options outlined in this consultation paper represent a shortlist of potential approaches for the development of the CER Data Exchange, based on stakeholder input to date. We welcome stakeholder feedback on these options – including alternative models or suggestions that may better address the needs of the energy market and support Australia's energy transition.



Use Case Functionality (Chapter 4)

The CER Data Exchange can be leveraged for multiple use cases simultaneously and can accommodate additional use cases into the future as customer and industry needs evolve. During consultation, participants identified the following 'foundational' priority use cases that would deliver immediate benefits while providing a flexible capability for future expansion:

- **Priority Use Case 1 – Sharing Network Limits**: This functionality would, with permission, provide visibility of data on grid constraints, enabling industry participants to optimise the deployment and operation of CER and respond to grid congestion. By facilitating better coordination between DNSPs, and technology providers / agents or other market participants, this use case objective is to enhance grid efficiency and support the integration of additional renewable energy.
- **Priority Use Case 2 – Supporting Local Network Services**: This use case would allow DNSPs to share data on local network conditions, helping to coordinate the delivery of dynamic local network support services and facilitate common data processes to discover, register, trigger, and verify service

opportunities. This will reduce grid congestion and improve network investment efficiency, improve CER integration, and create opportunities for customers to value-add on their CER investments.

- **Priority Use Case 3 – Consistent CER Standing Data**: This would provide trusted access to expanded, accurate and dynamically updated CER standing data. Consistent and verified data will support better customer experiences, planning activities and operational decisions by DNSPs, retailers, and other industry participants.

Stakeholder preferences | Stakeholders strongly supported the use cases that provide immediate, tangible benefits, particularly in improving energy system efficiency and enabling customer choice. Stakeholders raised concerns about the costs and technical feasibility of implementing these functionalities at scale, especially for smaller participants, with key trade-offs include balancing quick-win functionalities with long-term scalability and the benefits justifying the associated costs.

Data Sharing Capability (Chapter 5)

A core component of the CER Data Exchange is its ability to facilitate secure, standardised, and efficient data-sharing between organisations. Our consultation identified several data sharing capabilities for the CER Data Exchange in the table below.

Capabilities such as information security, format standardisation, access management and platform interoperability could be considered as fundamental to the Exchange providing secure, consistent and reliable services. Functionalities such as advanced data validation and custom data format could be optional features that offer adaptability for specialised requirements and less critical functions.

A design that consider essential and optional capabilities would allow the CER Data Exchange to evolve to meet future market demands, adapting as new technologies and as future requirements emerge. A modular approach to data exchange capabilities also allows the CER Data Exchange to stay relevant and effective in a rapidly changing energy landscape.

Stakeholder preferences | Stakeholders expressed a strong preference for the Exchange to provide secure, reliable and scalable data services. However, they also stressed the importance to consider the need to provide flexibility for innovation, inclusivity and cost management.

Ownership, Operations, and Oversight (Chapter 6)

The ‘operational structure’ of the CER Data Exchange is a fundamental consideration for stakeholders. The paper outlines three potential ownership and operational models – each with distinct trade-offs in terms of cost, complexity, and regulatory oversight:

- **Model 1 – Industry-Led Consortium**: This model would see an industry consortium responsible for the Exchange's ownership and operation. Stakeholders view this model favourably for its potential to foster industry collaboration and innovation. However, concerns were raised about commercial bias and the potential for larger participants to dominate the governance process, potentially disadvantaging smaller participants.
- **Model 2 – AEMO-led**: AEMO, as the national energy market operator, would own and operate the Exchange. This model is seen as the most cost-effective, leveraging AEMO's existing infrastructure and expertise. However, some stakeholders expressed concerns about AEMO's potential use case bias toward core responsibilities in market operation and system reliability.
- **Model 3 – Independent Government Agency**: A new, independent government agency would manage the Exchange, ensuring impartiality and public accountability. While this model provides the highest degree of neutrality, it also comes with the highest setup and operational costs, as well as potential political risk.

Each model presents unique trade-offs in terms of cost, operational complexity, and regulatory impact, allowing stakeholders to assess each option's alignment with their priorities and preferences. These models are designed to provide a balance between leveraging existing infrastructure and developing new capabilities to support the energy market's transition.

Stakeholder preferences | Stakeholders considered the Exchange as a public good and expressed a clear preference against private ownership. They considered public or hybrid ownership models are more able to prioritise consumer interests and avoid commercial bias. Stakeholders expressed mixed preference for the AEMO-led and the Independent Government Agency models. Some stakeholders considered AEMO-led model as more familiar and efficient, while others considered a new independent agency would provide neutrality but have higher initial setup cost and bureaucratic inefficiencies. Regardless of the ownership model selected, stakeholders have consistently highlighted the need for industry involvement and consultation on the Exchange's oversight.

Data Governance (Chapter 7)

As the CER Data Exchange evolves, a robust data governance framework will be essential to secure, standardised, and compliant data-sharing between organisations. This consultation paper presents four governance models, each varying in decision making body, compliance mechanisms, and stakeholder involvement. These models are designed to support stakeholder to consider the trade-offs associated with the alternatives. The variations in proposed models for consideration by stakeholders are:

- **Model A – Exchange Operator as Data Governance Authority:** The Exchange operator would oversee both operations and governance, potentially allowing for quicker decision-making and seamless alignment with operational requirements. Stakeholders expressed a preference for a data governance framework to compliment the Exchange regulatory oversight, to ensure impartial governance.
- **Model B – Industry Collaborative or Association as Data Governance Authority:** An industry-led body would manage governance, promoting broad engagement and adaptability to market needs. While this model fosters collaboration, it may face challenges in achieving consistent compliance and data quality across participants.

- **Model C – Existing Market Body or Regulator as Data Governance Authority:** An established regulator, such as Clean Energy Regulator or AER, would oversee governance, ensuring compliance and public trust. Despite being trusted, this model may limit flexibility and slow decision-making due to existing regulatory processes.
- **Model D – New CER Data Governance Authority:** A new, independent agency would manage data governance, providing a high level of neutrality and transparency. This model could be complex and costly to establish, potentially limiting its responsiveness to market changes.

Stakeholder preferences | Throughout the co-design process, stakeholders have emphasised the importance of both consistency in compliance and adaptability to new technologies in relation to data governance framework. They broadly support a balanced approach that provides rigorous oversight without stifling innovation.

Implementation Considerations (Chapter 8)

An implementation roadmap and costing assessment of a preliminary high-level design, born from stakeholder input, will be considered in 2025. Stakeholders have expressed a clear preference for a phased implementation of the CER Data Exchange that enables both foundational and advanced functionalities, similar to the UK's Digital Spine approach, which gradually introduced capabilities and expanded user participation. Chapter 8 provides stakeholders an early opportunity to input implementation considerations to the next workstream of this co-design process.

Key Phases of the CER Data Exchange Implementation:

- **Foundational Phase – Setup of Core Infrastructure and Priority Use Cases:** This phase establishes the essential data-sharing infrastructure, focusing on information security, format standardisation, and access management. Pilot testing will be conducted with select participants to identify and resolve any early-stage challenges.
- **Expansion Phase – Enhanced Functionality and Broader Integration:** This phase expands the Exchange's functionality, integrating new data sources, enhancing interoperability, and extending access to additional stakeholders.
- **Optimisation and Scaling Phase – Future-Proofing and Full Industry Rollout**: The final phase focuses on optimisation, scalability, and alignment with evolving standards. Stakeholder feedback will help refine the compliance frameworks, user experience, and technical integration, ensuring the Exchange remains effective and resilient.

Recognition is given to obtaining alignment on policy, regulatory, and legal considerations to support each phase, particularly concerning data privacy, compliance, and cost recovery. Many of these factors will be considered early in 2025 as part of the Implementation Roadmap development and planned consultations with stakeholders.

Next Steps and Call for Feedback

This paper invites stakeholders to contribute their insights on the preferred functionalities, use cases, and governance models – particularly in relation to operational models, oversight mechanisms and regulatory compliance. Stakeholders are also encouraged to provide feedback on the questions outlined in this paper, which will enable the project team to collate feedback from a comprehensive representation of industry views.

The CER Data Exchange represents a critical step in supporting Australia's transition to a more integrated, efficient, and consumer-centric energy market. AEMO encourages active stakeholder participation in this co-design process to ensure that the final high-level design delivers a robust and adaptable CER Data Exchange that aligns with both national policy goals and consumer and industry needs, contributing to a sustainable and resilient energy future for all Australians.

Written submissions will be a key input into the third workshop and final Outcomes report. We will continue to meet with stakeholders to test views and the implementation roadmap, including through our ongoing EWG meetings. Further, we intend to host a Stakeholder Summary Webinar prior to the end of 2024 and in early 2025.

Full list of consultation questions

Question 1: Priority Use Cases - Do the identified priority use cases effectively address immediate data-sharing needs, and are there any additional use cases you would recommend prioritising?

Question 2: Strategic Use Cases - How do you view the long-term value of the strategic use cases and are there specific outcomes you would like these use cases to achieve in the future? Also do the strategic use cases sufficiently complement the priority use cases? Do you have any feedback on when these use cases should be implemented?

Question 3: Additional Use Cases - Are there additional or alternative use cases that would enhance the CER Data Exchange's outcomes?

Question 4: Changes to Use Cases - Would you suggest any changes to the use cases presented? Please outline your reasoning.

Question 5: Prioritisation - Do you agree with industry preference that the CER Data Exchange should be designed with narrow capability initially but have the flexibility to expand in the future?

Question 6: Capability - Do the proposed data sharing capability discussed above support both current and future CER data sharing use cases? Please nominate what essential data sharing capability would be required?

Question 7: Additional Features - What additional features or capabilities could improve flexibility and scalability in the CER Data Exchange?

Question 8: Ownership Preferences - Which ownership model do you believe is best suited for the CER Data Exchange: Industry-led consortium, AEMO-led, or a New Independent Government Agency? Do you have feedback on the models in addition to those summarised in this paper? Are there other ownership models not listed in this paper that you would like us to consider?

Question 9: Oversight – prescription vs discretion - What level of oversight should apply to the CER Data Exchange? Should its operation be heavily prescribed, or should it be provided with operational discretion?

Question 10: Oversight body - Who should be responsible for overseeing the CER Data Exchange's operation? Are there other models of oversight that you would like considered? How important is regulatory independence in overseeing the CER Data Exchange, and would a new dedicated oversight agency or body better support transparent, impartial governance?

Question 11: Data Governance Preference - Which data governance model best aligns with industry's desire for trust, compliance, and flexibility?

Question 12: Adaptability - In your view, how should the data governance model support the integration of new use cases as CER technologies and industry demands evolve?

Question 13: Stakeholder Engagement - How frequently and in what format should the data governance framework engage stakeholders on changes to standards, compliance requirements, or new use cases?

Question 14: Data Quality - Whilst not included in the scope of the CER Data Exchange, do you have feedback or key considerations for ensuring data quality in a manner which compliments the Exchange?

Question 15: Alternative Preferences - Are there any data governance models not listed in this paper that you would like us to consider?

Question 16: Phased Implementation Roadmap - Do you agree with the proposed phased approach for the CER Data Exchange implementation? What adjustments or considerations would you suggest to better align the phases with the needs of your organisation?

Question 17: Cost Recovery Model Preferences - What are your preferences regarding cost recovery for the CER Data Exchange? Would a direct, shared, or government-supported model be preferred, and why?

Question 18: Regulatory and Policy Reforms - Which areas of policy or regulatory reform do you believe are most critical to support the CER Data Exchange? How should these reforms balance compliance with operational flexibility?

Question 19: Technical and Operational Challenges - What technical or operational challenges do you foresee in integrating your systems with the CER Data Exchange? Are there specific support mechanisms that would facilitate smoother adoption for your organisation?

Question 20: Impact on Stakeholders - What technical, regulatory, operational, or commercial impacts would you anticipate from implementing the CER Data Exchange in your organisation, and how could the roadmap or cost recovery model alleviate these impacts?

How to make a submission

The CER Data Exchange Industry Co-Design Project is seeking feedback on the high-level design for a national CER Data Exchange, as outlined in this report.

Throughout 2024, industry and interested stakeholders have been provided with multiple avenues to contribute to the development of the high-level design of the CER Data Exchange – including through the Expert Working Group, Industry Workshops or by providing written feedback to this Consultation Paper.

Consultation questions are raised throughout this report, with a consolidated list provided just above. Although these questions target specific design aspects of the CER Data Exchange, we welcome broader stakeholder commentary and views.

Submission process

Written submissions on this Consultation Paper should be lodged with AEMO by 21 November 2024. Submissions should be provided via email to cerdataexchange@aemo.com.au. Please reference 'Submission – CER Data Exchange Industry Co-Design Consultation Paper' in the email header.

AEMO is seeking your responses to the questions highlighted through this consultation paper, as well as any other feedback. Please respond to as many questions as you wish; you do not have to answer all the questions and brief responses are more valuable than no responses.

Further engagement opportunities

A Stakeholder Summary Webinar is expected to be held in the week commencing 9 December 2024. More information will be published soon.

The third workshop is expected to be held in mid-February 2025. We will send out more information confirming the date and calling for registrations in early 2025.

For more information, you can contact us

For more information on the Project, including summary reports from the first two Industry Workshops, please refer to the CER Data Exchange Industry Co-Design webpage or email your query to cerdataexchange@aemo.com.au.

Table of Contents

Tables

Figures

Glossary and Abbreviations

Term	Definition
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ARENA	Australian Renewable Energy Agency
BAU	Business As Usual
Capex	Capital Expenditure
CER	Consumer Energy Resource
DNSP	Distribution Network Service Provider
DOE	Dynamic Operating Envelope
DSO	Distribution System Operator
ESB	Energy Security Board
EWG	Expert Working Group
FCAS	Frequency Control Ancillary Services
FRMP	Financially Responsible Market Participant
ISP	Integrated System Plan
NEM	National Energy Market
NEO	National Electricity Objective
NER	National Electricity Rules
Opex	Operational Expenditure
OEM	Original Equipment Manufacturer
SWIFT	Society for Worldwide Interbank Financial Telecommunication
VPP	Virtual Power Plant

1 Introduction

The Consumer Energy Resources Data Exchange (CER Data Exchange) Industry Co-design is a joint initiative between the Australian Energy Market Operator (AEMO) and AusNet Services to work collaboratively with industry to co-design a national CER Data Exchange (Figure 1). Through previous engagements during Project EDGE on data exchange, some industry stakeholders requested the desire to have input to the development of the CER Data Exchange concept. A desire to consider a range of ownership options including industry-owned was expressed. This stakeholder feedback informed the establishment of this co-design project.

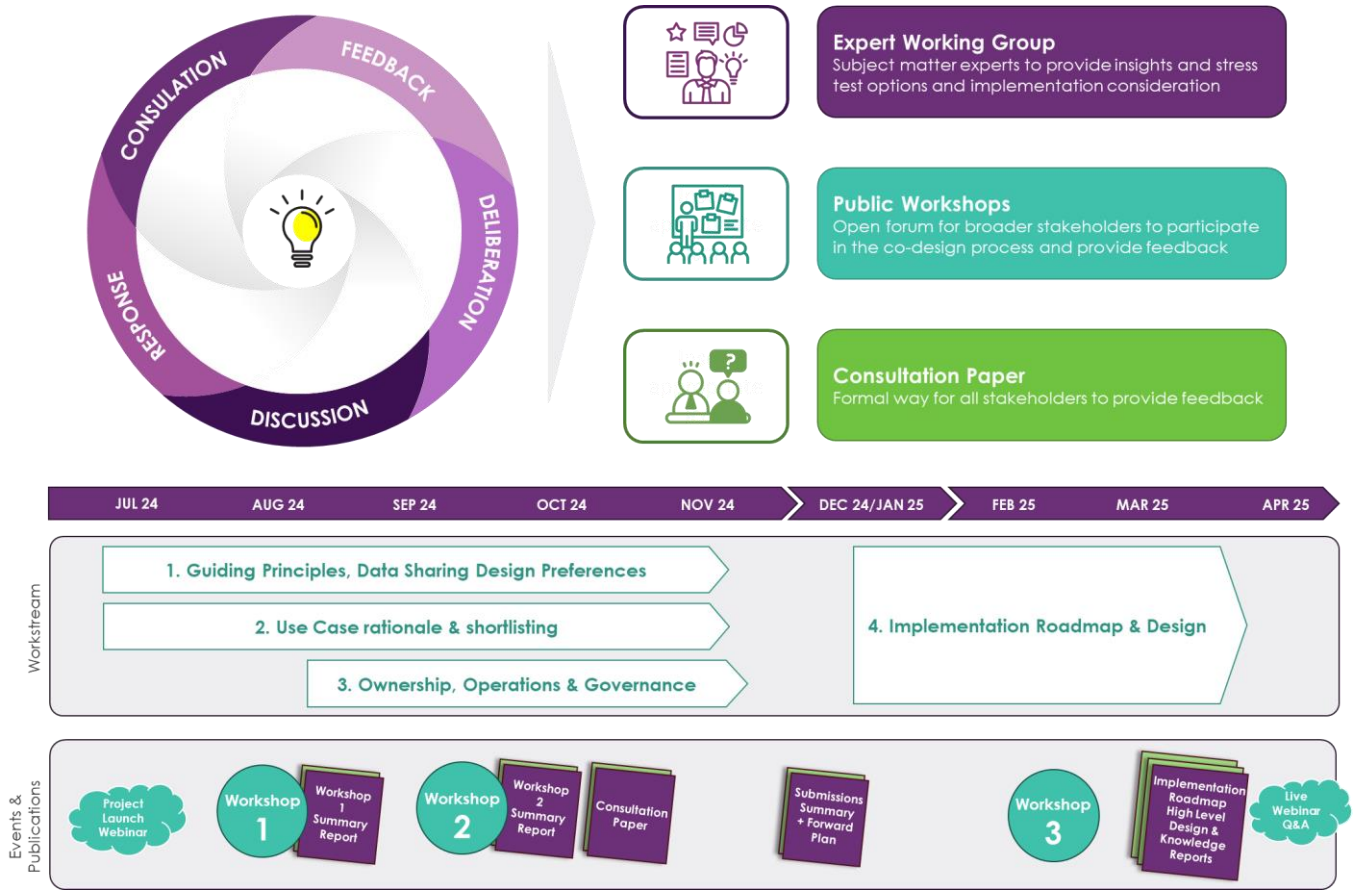
We are seeking to design a digital foundation to support multiple energy organisations to share CER information through a secure, reliable, flexible and cost-effective exchange. This project aims to promote the efficient integration of CER into the energy system in Australia. This would be a major National Electricity Market (NEM) development. We are leveraging the findings and experience from prior CER integration trials, both in Australia and overseas, with an eye towards future customer needs and evolving markets.

Figure 1: Key stages of CER Data Exchange Industry Co-design project

Given the complexity of the energy landscape, with its diverse stakeholder interests and technical challenges, AEMO has adopted a co-design process (supported by Mott MacDonald and EY) to facilitate industry-wide insights and support prioritisation of use cases and selecting the optimal form and function of the CER Data Exchange. Through engaging with stakeholders, the project team has explored the various trade-offs of various design choices and evaluated the preferences for priority use cases to best achieve the long term interests of consumers.

The co-design process has involved extensive engagement with stakeholders including consumer advocacy groups, aggregators, customer agents, network operators, retailers, digital service providers, Original Equipment Manufacturers (OEMs), industry bodies, and government and market entities. We have engaged with stakeholders through industry workshops, public webinars, an Expert Working Group (EWG) and this consultation paper (Figure 2).

Figure 2: Co-design phases, engagement channels and stakeholder forums



The co-design process was shaped around five workstreams:

1. **Need Drivers, Guiding Principles, and Design Preferences**: This workstream focused on defining the core value, data sharing infrastructure requirements, and guiding principles that the CER Data Exchange must meet, ensuring alignment with industry goals and consumer needs.
2. **Use Case Investigation**: Participants contributed to identifying real-world use cases that illustrate how the Exchange will function, helping clarify the role of the CER Data Exchange in supporting market activities such as CER and grid optimisation, flexibility service enablement, and consumer engagement.
3. **Ownership, Operation and Oversight**: Stakeholders explored various operation and ownership models, debating the merits of public versus private sector ownership, as well as assessing long-term regulatory oversight approach that would ensure alignment with the National Energy Objective.
4. **Data Governance**: This considers the frameworks for managing data security, access, and quality via the CER Data Exchange, ensuring that data is shared in a transparent, secure, and compliant manner while balancing the needs for flexibility and future scalability.
5. **Implementation Considerations**: An implementation roadmap and costing assessment of a preliminary high-level design, born from stakeholder input, will be considered in 2025. Stakeholders have expressed a clear preference for a phased implementation of the CER Data Exchange. Chapter 8 provides stakeholders an early opportunity to input implementation considerations to the next workstream of this co-design process.

This consultation paper, which focuses primarily on workstreams 1, 2, 3 and 4, provides an additional avenue to provide input for those who have already participated in the co-design process, as well as those who haven't. Consultation on workstream 5 will follow publication of this paper and include the final industry workshop inputting to the final project deliverables of a High-Level Design report, an implementation roadmap and Knowledge Sharing reports.

1.1 Stakeholder Engagement Activities

Expert Working Group

An EWG was established in July to guide the co-design process, shape industry workshops, and contribute to this consultation paper. The group plays an essential role in shaping the final High-Level Design report and implementation plan. Public consultations, webinars, newsletters, and ongoing stakeholder engagement have been used to foster alignment across the industry as the workstreams progress.

The EWG is made up of stakeholder representatives who responded to AEMO's call for nomination at the commencement of the project. AEMO selected 22 members to provide a broad and balanced perspective and for their relevant experience in retailer, CER aggregator, network, OEM, data and software businesses, research institutions, industry bodies, consumer advocates, and market bodies (Figure 3).[1]

Figure 3: Expert Representative Group stakeholder representatives

We have held eight EWG meetings to date. We have focused on exploring the issues related to the first three workstreams above. Inputs and feedback from EWG members have informed the design and content of the first

[1] https://aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/markets-and-framework/cer-data-exchange-industry-codesign/expert-working-group

two industry workshops, as well as the design proposals presented in this paper. We plan to hold several more EWG meetings focused on the Implementation Roadmap and Design workstream following the publication of this paper.

Industry Workshops

Three in-person public workshops are being delivered as part of the co-design process. Each workshop focuses on a key aspect of the CER Data Exchange, giving attendees the opportunity to provide feedback on materials developed by the project team and the EWG.

- **Workshop 1** took place in Melbourne on 6 August and was attended by 105 energy industry representatives. The workshop explored the design scope for the CER Data Exchange, preference setting for how it would operate, and use case options to determine its functions.
- **Workshop 2** took place in Sydney on 19 September and was attended by 91 energy industry representatives. The workshop explored the value of use cases in alternative futures and preference setting for the ownership, operations and functionality of the design.
- **Workshop 3** is due to take place in February 2025 and will focus on workstream 5.

Presentation materials and summary reports for workshop 1 and 2 have been published on the AEMO website.[2] Outputs and feedback provided during these workshops have informed the design proposals in this paper. Additional information on the workshop survey results is included in Appendix A3.

Consultation paper

This paper is a key point in our consultation process, bringing together outcomes for workstreams 1 and 2 and provides an avenue for written feedback to be received from all energy industry stakeholders with an interest in the project. This consultation paper outlines a customer vision, guiding principles, stakeholder design preferences, use cases, governance structures and implementation strategies for a national CER Data Exchange. These elements have been developed and informed by stakeholder input, feedback and discussions provided through the EWG, the first two industry workshops and additional ongoing stakeholder engagement.

High-Level Design and Knowledge Sharing reports

Responses to this consultation paper and outputs from the final EWG meetings and industry workshop will be collated to inform a High-Level Design report. This report will outline the project's findings and recommendations – including an implementation roadmap and indicative costs.

AEMO intends to hold a public webinar to present the findings of the project and recommendations from the report following its release.

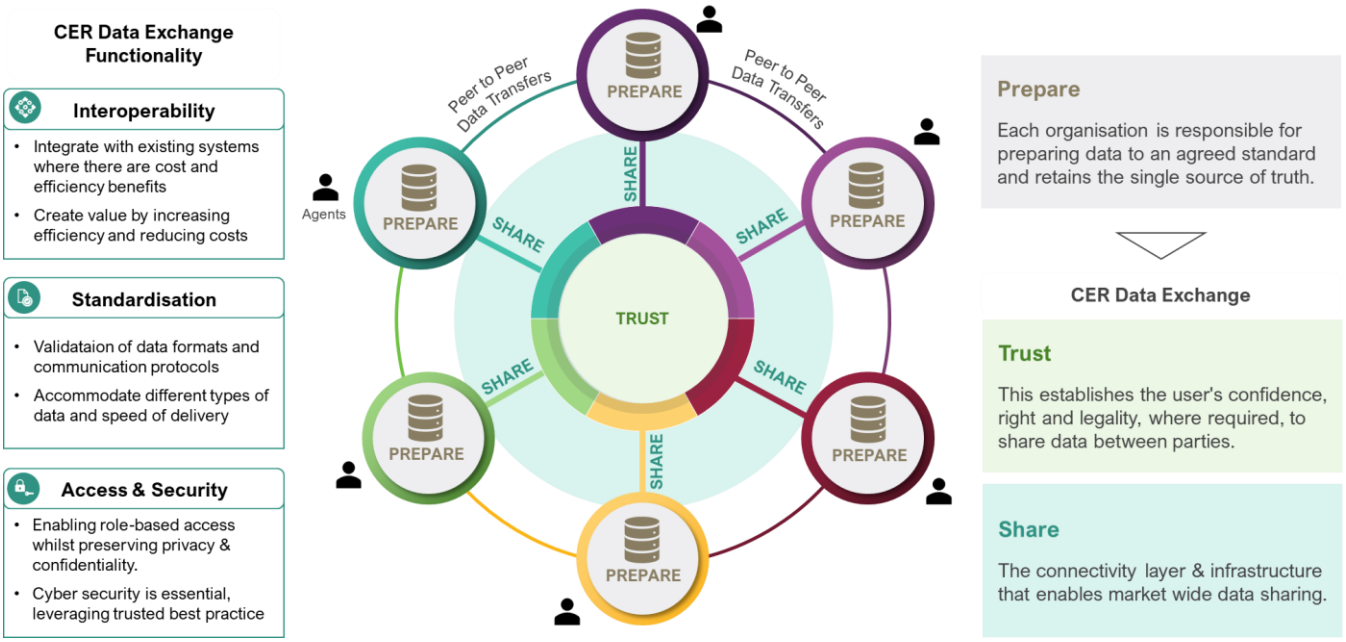
A Knowledge Sharing report will also be published. It will outline the project team's journey of applying a co-design framework to progress customer outcomes, and key learnings from the process.

[2] https://aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/markets-and-framework/cer-data-exchange-industry-codesign/industry-workshops

1.2 What is a CER Data Exchange?

The CER Data Exchange is envisioned as a secure, standardised system to facilitate the exchange of CER-related data between organisations (org-to-org) – such as network operators, retailers, aggregators, or customer agents (Figure 4). It is intended to streamline data sharing across the energy sector, improving coordination and enabling better integration of CER. While it will not be the sole method for transferring CER data, it offers a common, scalable solution to improve efficiency and reduce the cost in duplication of data-sharing processes.

Figure 4: CER Data Exchange



What it is

The CER Data Exchange Is:

- **A common infrastructure for standardised data sharing:** Facilitates the exchange of specific, standardised CER data across organisations.
- **Supportive of specific, use cases:** Focuses on targeted applications like grid stability and energy market operations, without overextending to complex needs.
- **An enabler of innovation:** Provides data access for new entrants and innovators accelerating the energy transition.
- **Privacy-focused:** Ensures consumer data protection while enabling trusted data sharing.
- **Aligned with net zero goals:** Helps efficiently integrate CER into the energy system, supporting sustainability and resilience.
- **A foundational enabling tool:** Provides secure data infrastructure but integrates with, rather than replaces, existing systems.

What it is not

The CER Data Exchange Is Not:

- **A control system for devices:** Facilitates data sharing only; device control remains separate.
- **A replacement for existing industry participant data systems:** Complements, rather than duplicates, existing investments.
- **A central repository for all CER data:** Connects existing data sources, without storing or controlling them.
- **A direct access point for consumers**: Focuses on organisation-to-organisation sharing, not direct customer interactions.
- **A unified security and access system:** Does not impose a single security or access model across all CER devices or industry participant systems.

The CER Data Exchange will operate alongside other systems and frameworks, such as the Consumer Data Right (CDR) and the DER Register (see Appendix A1). Rather than serving as the sole pathway for all data transfer, the CER Data Exchange is designed to work in a complementary role, enhancing the existing ecosystem. Its purpose is to facilitate flexible and efficient data sharing without replacing current systems. By implementing standard integrations and transactions, the CER Data Exchange intent is to reduce reliance on fragmented, point-to-point connections that often complicate and add cost to data exchange (Figure 5). Other industries have illustrated the value of such an approach (e.g., finance). Systems like SWIFT have successfully standardised data transmission across international payments, streamlining processes without displacing other data transfer methods. Although the CER Data Exchange primarily supports org-to-org data sharing, it benefits consumers by enabling greater choice and flexible CER to lower bills, as well as supporting all consumers to access more energy services options and innovation over time (Figure 6).

Figure 5: Overcoming known industry macro challenges

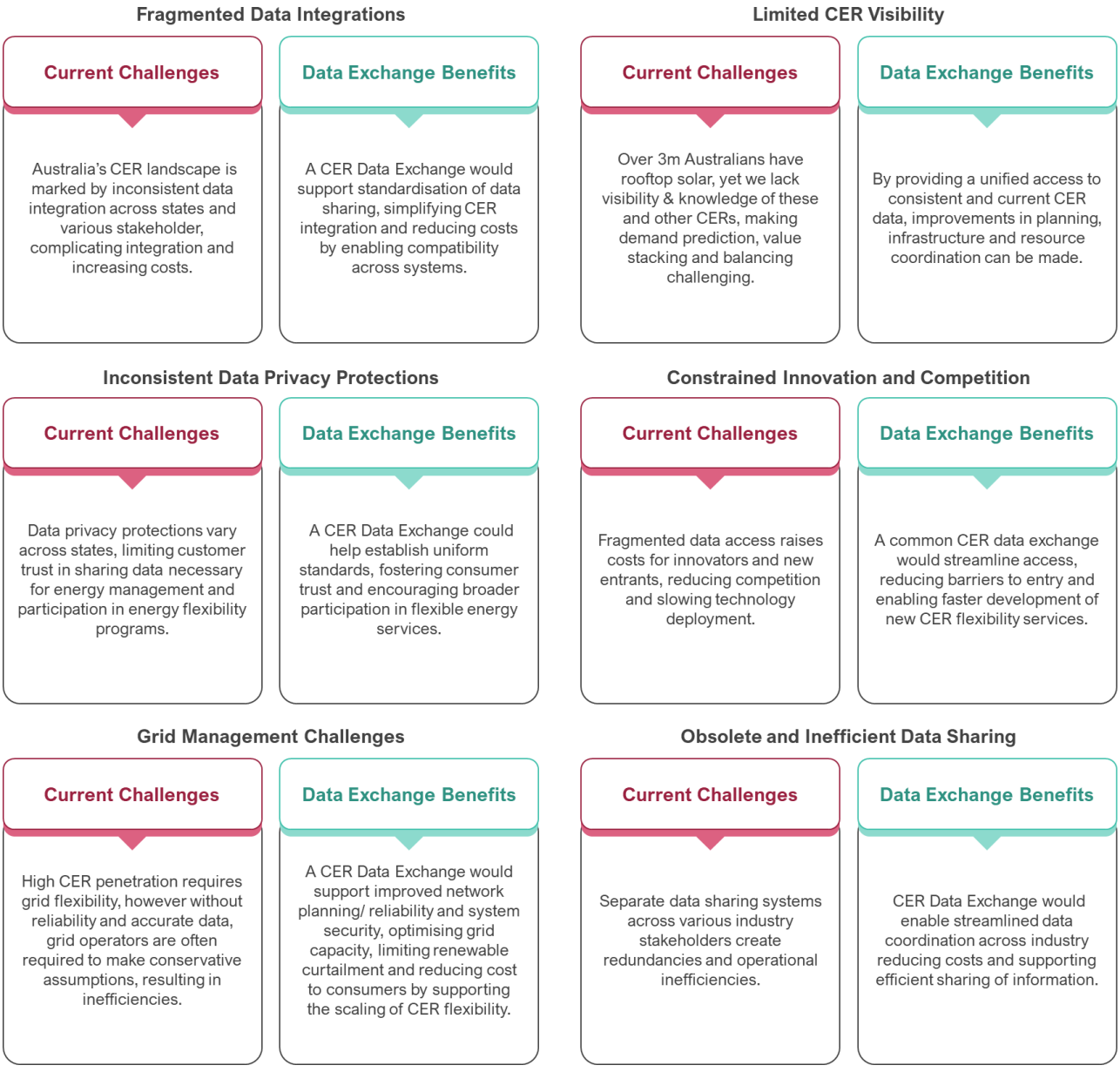
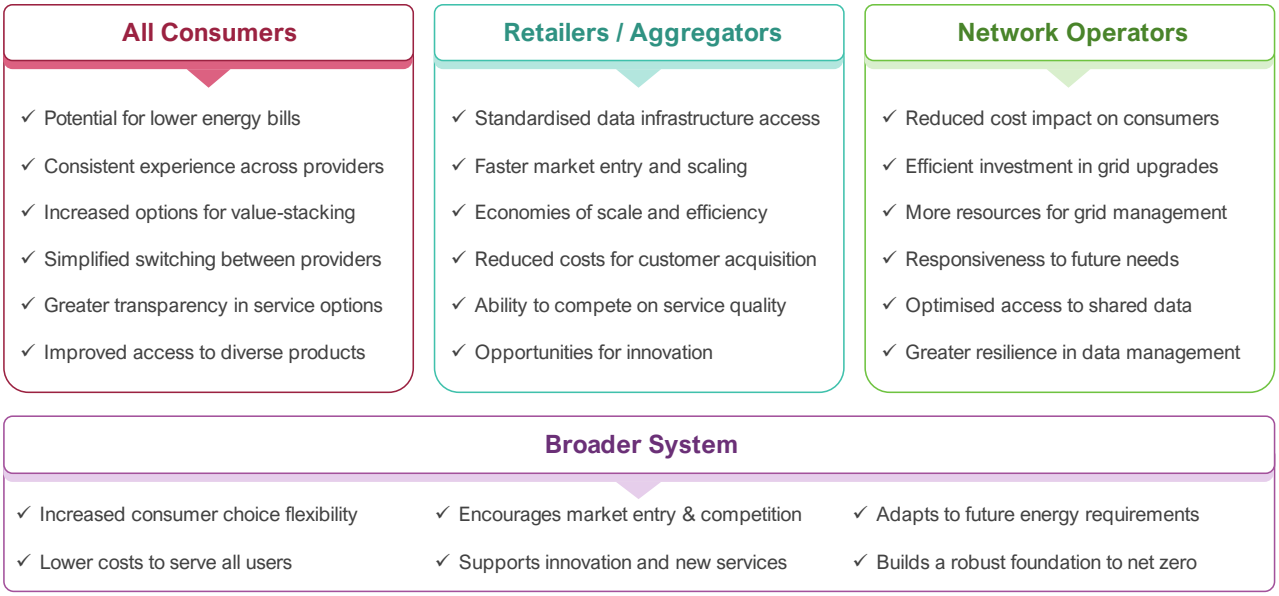


Figure 6: Summary of benefits



We are seeking stakeholder feedback on the trade-off of the long-term efficiency gains, potential cost implications, and enhanced interoperability. The ultimate design of the CER Data Exchange will hinge on the benefit to consumers and the level of industry collaboration required for successful integration. Figure 7 provides a summary of key implementation challenges and benefits of a national CER Data Exchange.

Figure 7: CER Data Exchange Implementation Challenges and Benefits

Challenges

- **Interoperability Issues**: Existing systems use varied data formats and protocols, making seamless integration complex. Stakeholders must evaluate the costs of upgrading or adapting systems.
- **Security and Privacy Concerns**: Handling sensitive customer data across multiple organisations introduces significant cybersecurity and privacy risks. Robust frameworks must be in place to mitigate these risks.
- **Cost of Implementation**: Establishing a national CER Data Exchange will require upfront investment from stakeholders, including infrastructure upgrades and personnel training.
- **Regulatory Alignment**: Navigating multiple regulatory requirements across states and aligning industry-wide can slow down the exchange's implementation.
- **System Complexity**: The data exchange will need to handle large volumes of potentially timely data across many entities, requiring sophisticated management systems.
- **Potential Duplication of Systems**: There is a risk of overlapping with existing data-sharing systems, leading to inefficiencies if not carefully planned.

Benefits

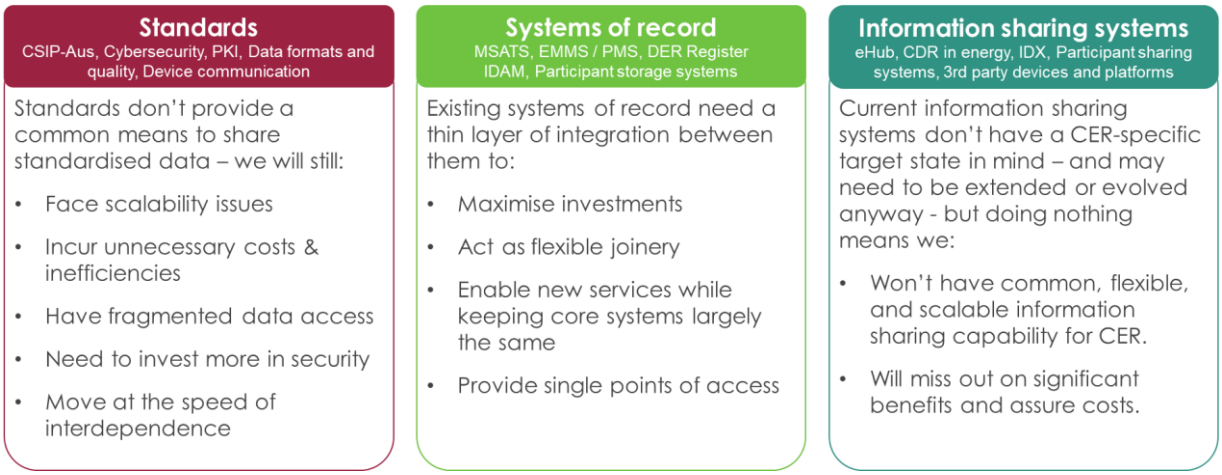
- **Standardisation**: A national CER Data Exchange could standardise data formats and transfer protocols, reducing fragmentation and promoting consistency across the industry.
- **Improved Data Accessibility**: It will streamline data-sharing processes, providing easier access to reliable and accurate CER data for all stakeholders.
- **Operational Efficiency**: The exchange could improve timely data flow, enhancing decision-making and coordination between market participants.
- **Enhanced Grid Stability**: By sharing data more efficiently, grid operators can better manage CER integration, helping to ensure grid reliability and support renewable energy goals.
- **Consumer Benefits**: Though focussed on organisation-to-organisation, the exchange would indirectly benefit consumers through improved service offerings, more accurate billing, and better grid reliability.
- **Cost Reduction in Long-Term**: While there are upfront costs, a standardised exchange could reduce operational redundancies, leading to cost savings in data management over time.

1.2.1 Current data transfer capabilities

Currently, CER data is transferred through a network of fragmented, bespoke systems. These systems typically rely on point-to-point connections between organisations, with limited universal data sharing standardisation in place, even where standards are applied. As a result, each entity maintains its own infrastructure and protocols for exchanging data – leading to varying degrees of interoperability and significant inefficiencies in the coordination of CER information. This complexity can hinder data-sharing processes, increase operational costs and delay system integration – especially as more CER are introduced into the energy market. Security protocols and data formats also differ across platforms, which makes it difficult to ensure the seamless and secure transfer of information between participants.

Currently, there are many standards, systems of record, information sharing systems and other existing capabilities in Australia (see Figure 8). However, these capabilities may exacerbate rather than solve the issue. While there has been a distinct preference by stakeholder for the CER Data Exchange to enhance or extend existing capabilities, most are not designed to handle the scale and complexity that CER data requires, as penetration continues to grow. The absence of national system dedicated to CER data complicates the coordination of assets across multiple organisations, often resulting in suboptimal outcomes for all parties.

Figure 8: Existing industry capabilities and challenges (Further detail provided in Appendix A1)



1.2.2 Information Sharing Systems Under Development

Currently, there are several legacy system for information sharing that are reaching their end of life and need to be replaced in order to facilitate the energy transition; one of the key sharing systems under development is the Industry Data Exchange (IDX) run by AEMO. IDX is a NEM reform initiative focused on modernising existing data exchange capabilities in the NEM and WEM electricity and gas markets by replacing legacy systems with secure, standardised integration patterns. It aims to streamline data flows between market participants, DNSPs, aggregators, and service providers.

While IDX (see Appendix A2.1 for fact sheet and FAQs) focuses on core market transactions, it has not identified any specific CER data sharing use cases needed for complete integration. Through the CER Data Exchange co-design process, stakeholders requested additional information about the AEMO IDX project and how this project relates to the specific CER use cases that have been covered through the Industry Workshops.

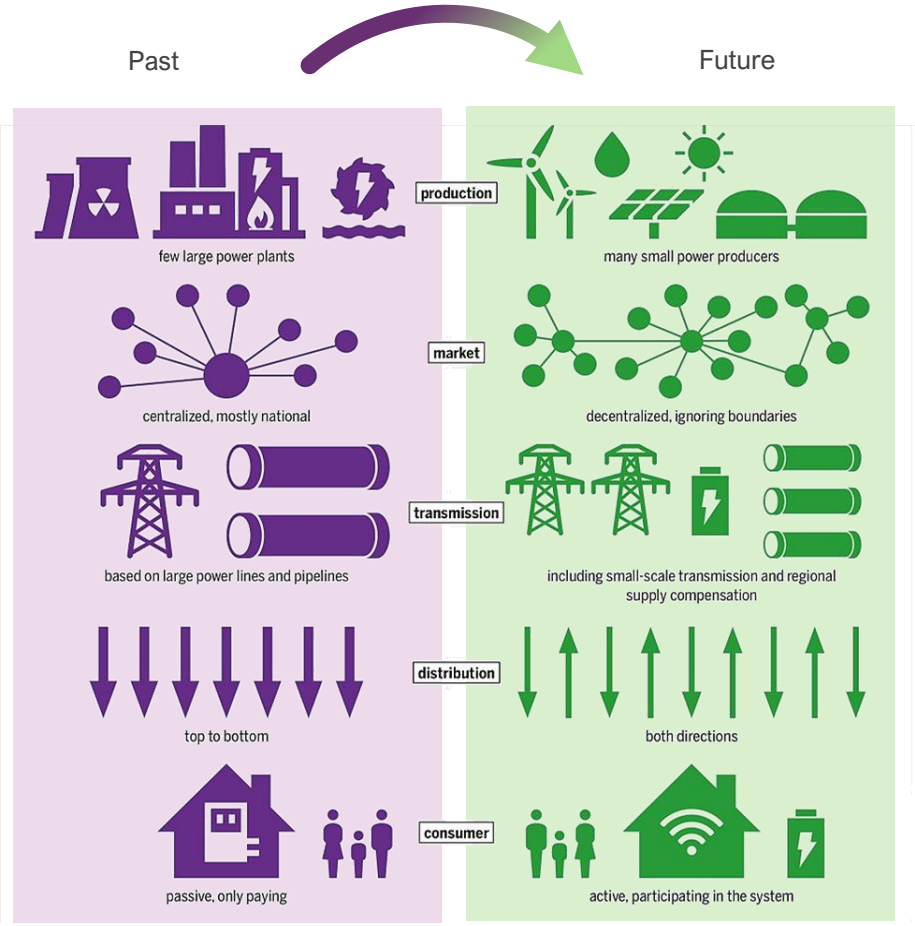
2 The need for a CER Data Exchange

2.1 The Energy Transition

Australia's energy system is rapidly changing as it shifts from a centralised, fossil fuel-based system to a more complex, decentralised, and renewable energy-based system (Figure 9). This change is being driven by government policies and the development and adoption of new generation, storage and digital technologies.

The Australian Government has legislated to reduce greenhouse gas emissions to 43 per cent below 2005 levels by 2030 and to achieve net zero emissions by 2050. It also aims to increase renewable energy generation in the National Electricity Market to 82 per cent by 2030.

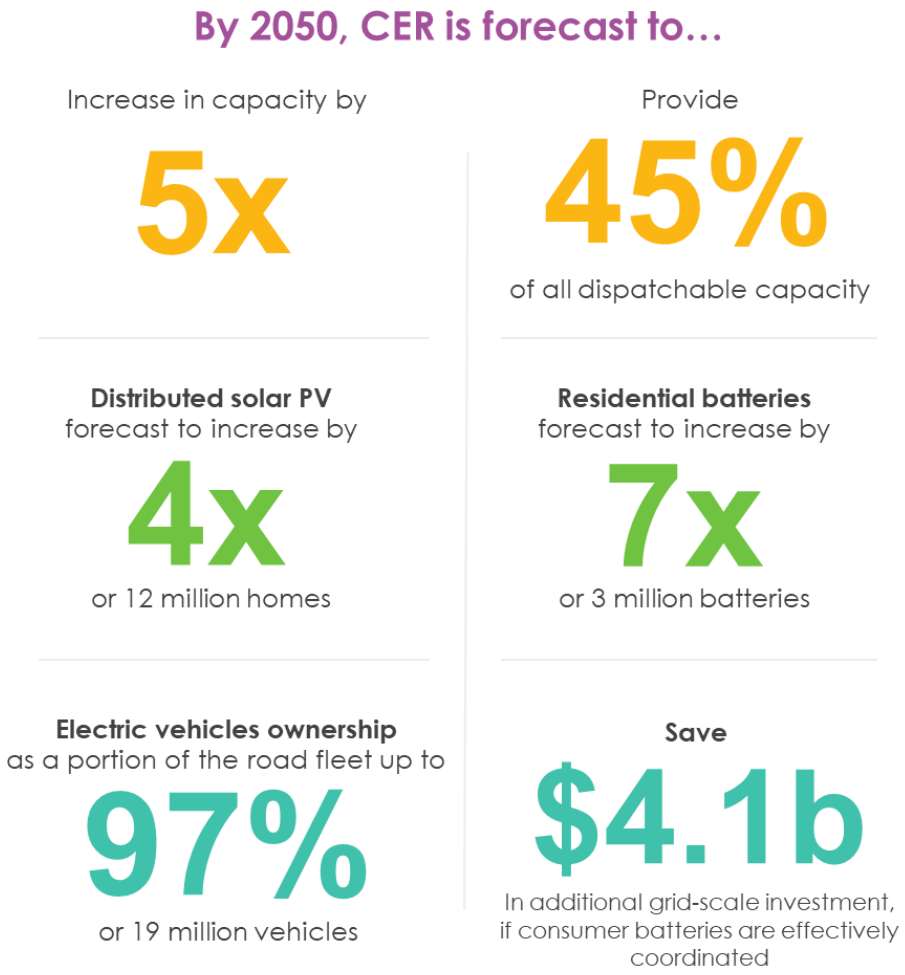
Figure 9: Australia's energy system is changing rapidly



As Australia progresses toward a net-zero energy future, the transition to a decentralised energy system becomes increasingly vital. The latest AEMO Integrated System Plan (ISP) highlights that the rapid growth of CER, including rooftop solar, battery storage, and electric vehicles, requires a reimagined energy system that is as distributed as it is resilient. Decentralisation is more than simply adding new technologies; it signifies a shift where consumers are active participants and decision makers in energy generation, storage, and consumption. This transition relies heavily on robust, transparent data flows that can manage the complexities of a diverse energy system.

CER is a key part of our system now and in the future (Figure 10). By 2050, the Australian energy system is forecast to have 86 GW of distributed solar photovoltaics and 44 GW of CER storage. Together they will make up 35% of the installed capacity of the NEM by 2049-50, greater than the forecasted installed capacity of utility scale solar and onshore wind generation. This represents a fundament change to the energy system.

Figure 10: CER's crucial role in Australia's energy system



Source: AEMO 2024 ISP: https://aemo.com.au/-/media/files/major-publications/isp/2024/2024-integrated-system-plan-isp.pdf?la=en

2.2 Data is a key enabler

Effective data integration and management will allow distributed resources to communicate seamlessly, supporting dynamic operating environments, optimising grid reliability, and ensuring that energy resources deliver value both to individual consumers and the system as a whole. A common data framework is crucial to harmonise standards, track compliance, and deliver the insights needed for a resilient, flexible, and consumer-driven grid. As decentralisation reshapes the energy landscape, data becomes the backbone of this energy transformation, driving efficiencies, fostering consumer trust, and accelerating the pathway to a sustainable energy future.

According to AEMO's 2024 ISP,[3] CER has the potential to offset $4.1 billion of grid-scale investment. Integrated CER data will help manage grid congestion, enhance customer engagement, and reduce operational costs – ultimately delivering efficient and reliable energy solutions that benefit all Australians.

However, to realise these benefits, CER must be properly integrated and coordinated effectively. Common market arrangements, standards and efficient data transfer between industry bodies, service providers, aggregators, equipment manufactures and consumers are needed. Data enables market participants, network operators, and regulators to manage energy flows efficiently, ensuring that consumers and businesses can optimise their energy usage while maintaining grid and system stability.

2.3 A national reform priority set out in the CER Roadmap

In November 2023, during the Energy and Climate Change Ministerial Council (ECMC) meeting, Ministers acknowledged the need for a coordinated approach to CER integration and established a CER Taskforce to fast-track priority projects, which commenced in early 2024. By March 2024, the taskforce outlined an initial work plan detailing early priorities to support the national CER strategy.

Released July 2024, the National CER Roadmap,[4] developed by the interjurisdictional CER Working Group alongside market bodies, provides the strategic direction for this effort, highlighting a consistent national approach to optimise CER potential. It aims to streamline CER adoption, create equitable benefits, and enable jurisdictions to bolster CER investments efficiently.

The CER Roadmap outlines a set of reform priorities to build national consistency on how governments will work to enable CER's vast potential to lower bills, improve reliability and cut network costs by reducing the need for grid-scale investment as evidence has showed effective integration and management of CER could unlock billions of dollars in saving to the energy system and consumers.

Defining and implementing a CER Data Exchange is a key National CER Roadmap National Reform Priority. This priority area focuses on establishing the necessary CER data access and sharing arrangements to enable future operations, markets, and services to unleash the full potential of CER to benefit all consumers. Staged deployment of the data sharing arrangements including the CER Data Exchange is expected to begin in 2025 and expect to be implemented by 2027.

The CER Data Exchange concept originated from years of industry commentary about the need, insights from local trials supported by positive cost-benefit analysis benefits and learnings from global practices.

2.4 Local and International supporting evidence

Learnings from Australian trials like Project EDGE, Project Symphony, and other ARENA-funded initiatives have demonstrated that fragmented data exchange mechanisms limit the scalability and integration of CER, hindering

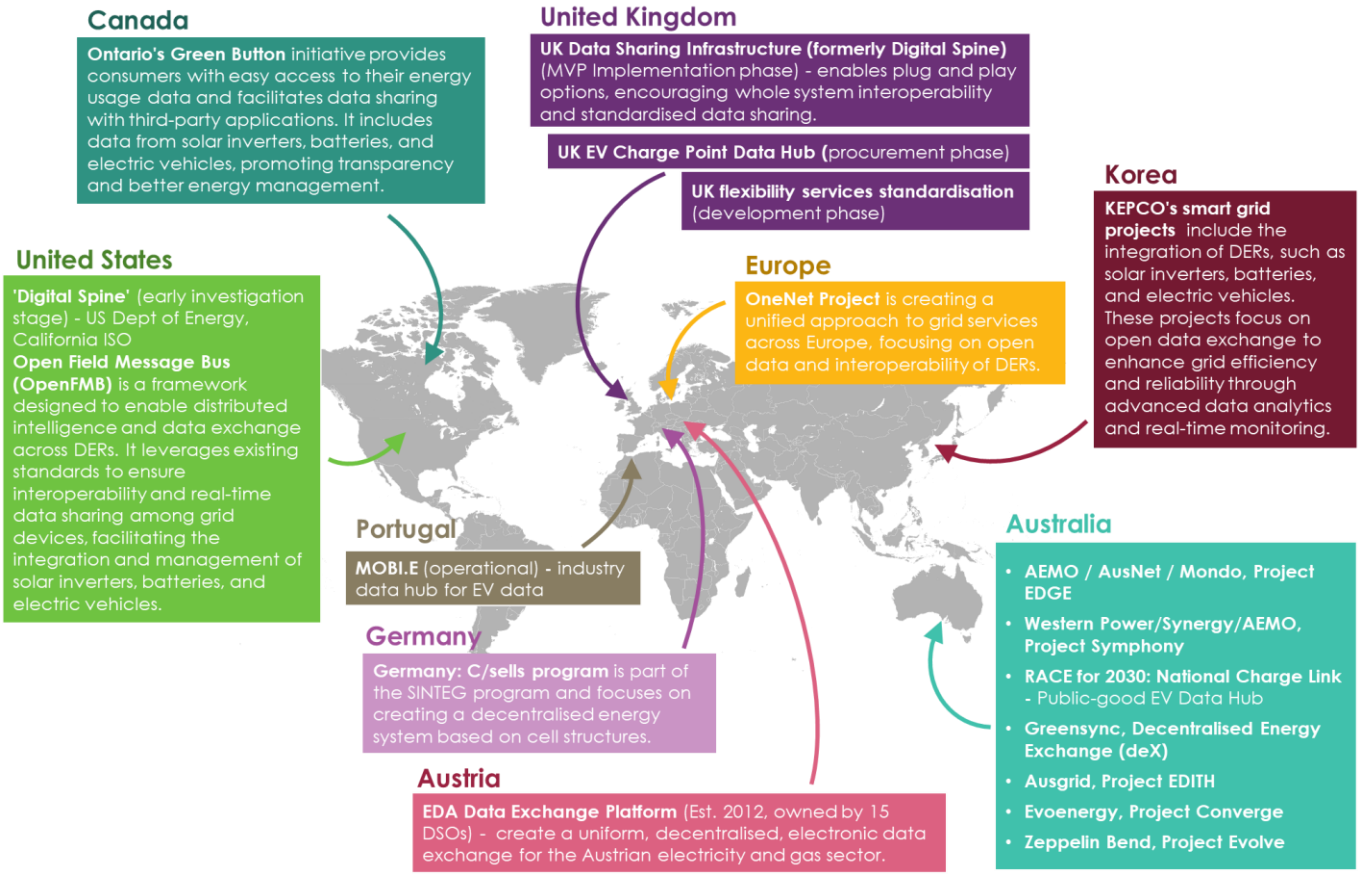
[3] See: https://aemo.com.au/-/media/files/major-publications/isp/2024/2024-integrated-system-plan-isp.pdf?la=en

[4] See: national-consumer-energy-resources-roadmap.pdf

efficient energy market participation and reducing customer value.[5] These projects have highlighted the urgent need for a secure, standardised, and interoperable CER Data Exchange.

International experience, such as the UK's Digital Spine study,[6] reinforces these findings (see Figure 11). In the UK, the absence of a common digital energy infrastructure for distributed energy data exchange has led to barriers to entry, increased operational costs, and reduced CER value and consumer choice. The fragmented landscape in the UK, where organisations must navigate a variety of standards and platforms, offers a cautionary example of the risks associated with a lack of coordination in data management.

Figure 11: International and domestic experience [7] (Further information included in Appendix A5)



Further to this, there have been many recent studies highlighting the significant potential benefits to consumers of the efficient integration of CER. As part of Project EDGE, a Deloitte Access Economics and Energeia cost–benefit analysis showed that greater coordination of active CER in the NEM can result in an incremental benefit to all consumers of up to **$5.15–6.04 billion** under the different AEMO ISP scenarios. Deloitte and Energeia found a 'data hub' (similar to the CER Data Exchange concept) would conservatively reduce costs by up to $0.45 billion compared to a point-to point approach over a 20-year time horizon. Deloitte found a data hub model would provide a lower cost approach for scalable CER Data Exchange between participants, compared with an approach with many point-to-point interactions, by reducing the number of integrations, as each participant only needs to

[5] See: AEMO | Project EDGE Reports; Project Symphony - Final Lessons Learnt Report - Australian Renewable Energy Agency (ARENA)

[6] Digital spine feasibility study: exploring a data sharing infrastructure for the energy system - GOV.UK (www.gov.uk)

[7] See: https://aemo.com.au/-/media/files/initiatives/der/2024/international-cer-exchange-examples.pdf?la=en

integrate with one industry data hub. In addition, Deloitte found considered a data hub could deliver further upside through facilitating new CER-based service innovations more easily and at lower cost as it simplifies integration, identity verification and reporting between participants.[8]

[8] See: project-edge-independent-cba-full-report.pdf

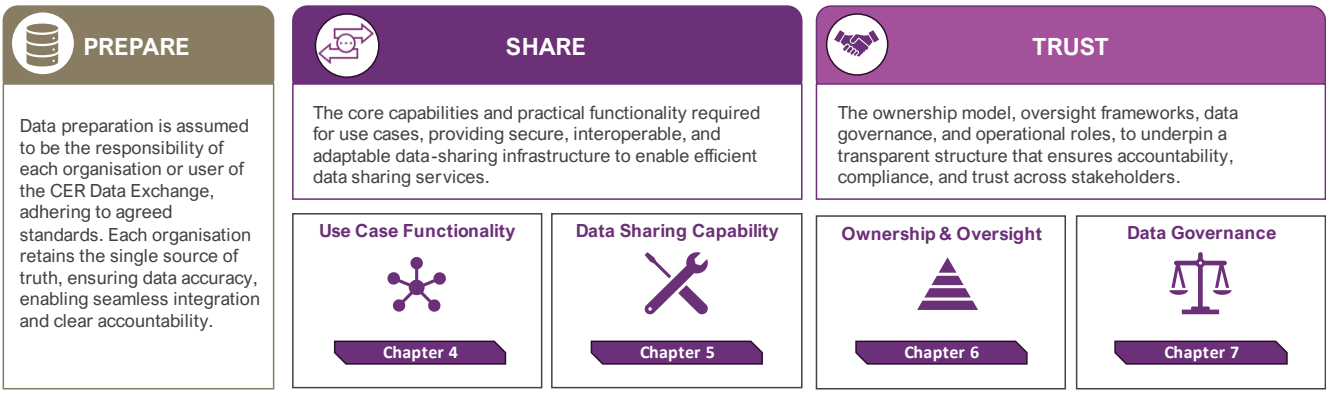
3 What are we seeking feedback on?

We are seeking stakeholder feedback on the foundational aspects of the CER Data Exchange to inform the development of a secure, adaptable, and effective data-sharing system that will support the integration of CER into the broader energy system. Stakeholder input will be essential to ensuring that the Exchange effectively meets both industry and consumer needs while addressing regulatory compliance.

Consultation Focus Areas

The paper is structured around four core elements across two components of the CER Data Exchange and builds on the data exchange journey nomenclature used by the UK Digital Spine, as illustrated in Figure 12.

Figure 12: Consultation Focus Areas



Each of these areas is presented with various proposed options, reflecting different approaches to balancing the co-design guiding principles (see below). We are seeking stakeholder views on trade-offs associated with each model, and insights on how these could be refined or improved. The intention is to create a solution that maximises consumer benefits, aligns with industry needs, and fosters equitable access to data-sharing capabilities.

The CER Data Exchange will not be the only data sharing means in the market and is not intended to operate or control CER devices.

How did we arrive at the options in this paper?

The shortlisted options presented in this consultation paper were developed through a collaborative co-design process together with the EWG which consists of 22 members representing diverse sectors, including retailers, network operators, data/software businesses, research institutions, and consumer advocates, ensuring balanced perspectives. Insights from eight EWG meetings and two industry workshops (more than 170 attendees collectively) shaped the design proposals, focusing on key elements like data sharing, use cases, ownership models, and governance. Stakeholder input from these engagements has been crucial in narrowing down the shortlisted options for feedback.

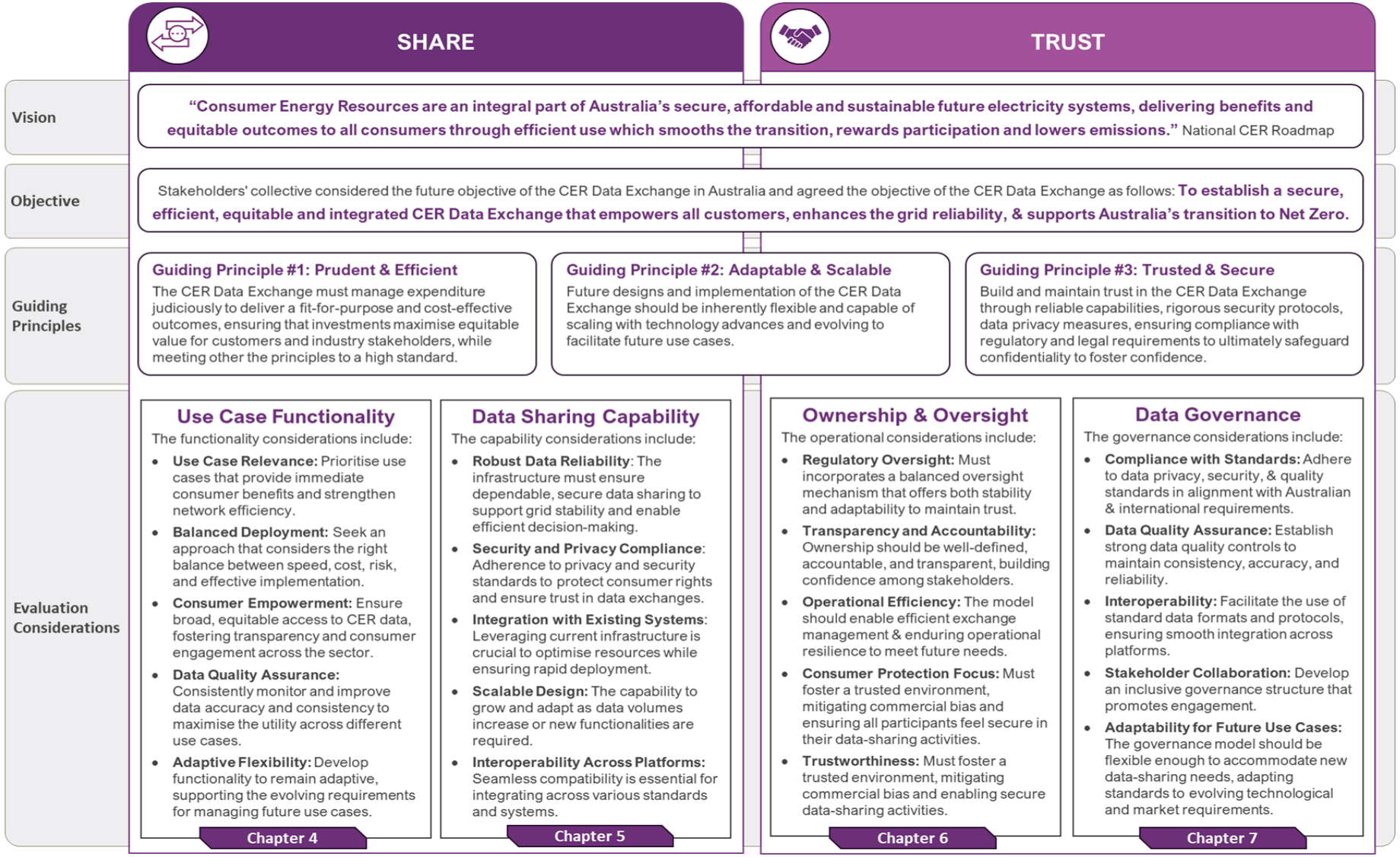
Next steps

Implementing the CER Data Exchange will require a coordinated effort, balancing the technical, operational, and commercial needs of stakeholders with robust governance and compliance measures. Feedback gathered in this consultation phase will inform the final roadmap and implementation plan, laying the foundation for an efficient, secure, and adaptive data exchange that supports Australia's decentralised transition to Net Zero.

Following this consultation, AEMO and industry partners will integrate stakeholder insights into the final high-level design and begin the implementation plan. These next steps will include additional workshops and consultations to solidify industry alignment, refine cost-assumptions and recovery mechanisms, and build out the required regulatory and policy reforms. Stakeholders' continued engagement is essential to delivering an effective and forward-looking CER Data Exchange.

An overview of the consultation process is provided in Figure 13.

Figure 13: Consultation Overview



	SHARE	TRUST
Description	The core capabilities and practical functionality required for use cases, providing secure, interoperable, and adaptable data-sharing infrastructure to enable efficient data sharing services.	The ownership model, oversight frameworks, data governance, and operational roles, to underpin a transparent structure that ensures accountability, compliance, and trust across stakeholders.
Shortlisted Options	**Use Case Functionality** **Priority** Sharing Network Limits Supporting Local Network Services Consistent CER Standing Data + Stakeholder Use Cases **Strategic** Grid Data Collaboration Flexibility Service Requests Visibility of CER Customer Choices Streamlined CER Portfolio Data Access **Chapter 4** **Data Sharing Capability** Information Security Format Standardisation Data Governance Access Management Platform Interoperability Advanced Data Validation Custom Data Formats Batch vs. Real-Time Processing **Chapter 5**	**Ownership & Oversight** **Model 1:** Industry-Led Consortium **Model 2:** AEMO-Led **Model 3:** New Independent Government Agency **Chapter 6** **Data Governance** **Model A:** Exchange Operator as Authority **Model B:** Industry Collaborative or Association **Model C:** Existing Market Body or Regulator **Model D:** New CER Data Governance Authority **Chapter 7**
Consultation Questions	1. **Priority Use Cases**: Do the identified priority use cases effectively address immediate data-sharing needs, and are there any additional use cases you would recommend prioritising? 2. **Strategic Use Cases**: How do you view the long-term value of the strategic use cases and are there specific outcomes you would like these use cases to achieve in the future? Also do the strategic use cases sufficiently complement the priority use cases? Do you have any feedback on when these use cases should be implemented? 3. **Additional Use Cases** Are there additional or alternative use cases that would enhance the CER Data Exchange's outcomes ? 4. **Changes to Use Cases** Would you suggest any changes to the use cases presented? Please outline your reasoning. 5. **Prioritisation:** Do you agree with industry preference that the CER Data Exchange should be designed with narrow capability initially but have the flexibility to expand in the future? 6. **Capability:** Do the proposed data sharing capability discussed above support both current and future CER data sharing use cases? Please nominate what essential data sharing capability would be required? 7. **Additional Features:** What additional features or capabilities adjustments could improve flexibility and scalability in the CER Data Exchange?	8. **Ownership Preferences:** Which ownership model do you believe is best suited for the CER Data Exchange: Industry-led consortium, AEMO-led, or a New Independent Government Agency? Are there other ownership models not listed in this paper that you would like us to consider? 9. **Oversight – prescription vs discretion:** What level of oversight should apply to the CER Data Exchange? Should its operation be heavily prescribed, or should it be provided with operational discretion? 10. **Oversight body:** Who should be responsible for overseeing the CER Data Exchange's operation? How important is regulatory independence in overseeing the CER Data Exchange, and would a new dedicated oversight agency or body better support transparent, impartial governance? 11. **Data Governance Preference:** Which data governance model best aligns with industry's desire for trust, compliance, and flexibility? 12. **Adaptability:** In your view, how should the data governance model support the integration of new use cases as CER technologies and industry demands evolve? 13. **Stakeholder** Engagement: How should the data governance framework engage stakeholders on changes to standards, compliance requirements, or new use cases? 14. **Data Quality:** Whilst not included in the scope of the Exchange, do you have feedback or key considerations for ensuring data quality in a manner which compliments the Exchange? 15. Are there any data governance models that you would like us to consider?

4 Use Case Functionality

This chapter explores the use cases for the CER Data Exchange. Use cases are specific, practical scenarios that illustrate how the CER Data Exchange will support data sharing and collaboration across organisations in the energy sector. These use cases have been developed using learning from Australian pilots and trials, international initiatives and stakeholder feedback. They are intended to address both immediate needs and future opportunities – laying the groundwork for an efficient, consumer-focused energy landscape.

Stakeholder feedback is sought on which use cases would most benefit from a CER Data Exchange. It is not assumed that all use cases would need to be supported by the Exchange.

4.1 Co-design refinement summary

The development of the use cases emerged from a collaborative co-design process involving stakeholders to identify practical applications that align with both current needs and future priorities in the CER data landscape. Figure 14 provides an overview of the co-design inputs and refinement outcomes from the co-design process thus far.

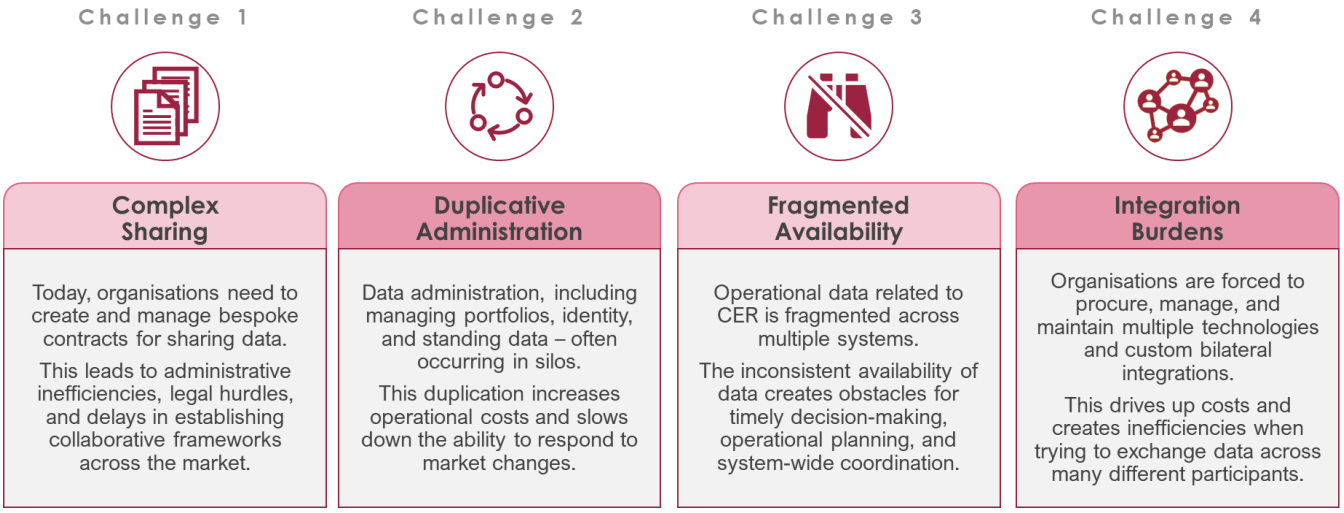
Figure 14: Co-design Refinement Stages

4.2 Overall stakeholder sentiments

The use cases are grounded in real-world challenges and are designed to meet the diverse needs of various industry stakeholders. Stakeholders shared insights on immediate operational needs, future priorities, and specific

concerns around data management, privacy, and interoperability. Although some stakeholders prioritised use cases that would deliver quick wins and enhance operational visibility, others emphasised the importance of long-term adaptability and flexibility for evolving technologies – such as EV integration. These varied perspectives were critical to refining each use case, ensuring that the CER Data Exchange can deliver meaningful value across different segments of the market. Stakeholder considered four data exchange challenges as outlined in Figure 15.

Figure 15: Data exchange challenges



Use cases were considered across a range of categories, including:

- **System Operation & Security**: This category addresses critical needs for maintaining grid stability, security, and operational efficiency. It includes measures for data exchange, emergency responses, localised grid support, and compensatory actions to ensure reliable energy system in a high CER future.
- **Market Efficiency & Performance**: Focused on improving the efficiency and performance of the energy market, this category includes use cases that provide transparency, facilitate the trade of flexibility services between organisations, and optimise participation in market activities. It is key to ensuring that market signals encourage the most cost-effective and resilient energy usage.
- **Customer, Asset, and Agent Records**: This category covers use cases related to managing consumer data, assets, and contractual relationships. It focuses on customer rights, consent, and ensuring smooth interactions between energy providers, customers, and the broader energy system. It also supports local energy trading and collaboration through community-based models.

Working closely with the EWG, we identified several potential use cases under each of the above categories, as outlined in Figure 16. It is noted that these are 'primary use cases' that can support other, complimentary activities.

Figure 16: List of Primary Example Use Cases

System Operation & Security use cases

Use cases for information exchange to manage power flows and risks:

1. Sharing Network Limits
2. Grid Data Collaboration
3. Scaling Dynamic Network Pricing
4. Supporting Local Network Services

Market Efficiency & Performance use cases

Use cases for information exchange for CER participation services

5. Accessibility of Market Prices
6. Flexibility Service Requests
7. Streamlined CER Portfolio Data Access

Customer, Asset, & Actor Records use cases

Use cases for information exchange on customer's CER choices:

8. Visibility of CER Customer Choices
9. Consistent CER Standing Data
10. Support EV Uptake and Integration

We received significant feedback on the above use cases through the EWG and the two workshops, as outlined in Table 1. More detail on these and other potential use cases is provided in Appendix A4.

Table 1: Primary Use Cases - Stakeholder Feedback

Use case	Description	Stakeholder feedback
System Operation and Security		
1. Sharing Network Limits	Distribution network assigned dynamic limits across NEM jurisdictions may be shared via a common integration point. This capability will enable improved and informed decisions by customer agents on available network capacity, to co-optimise, access the network, and act in line with grid limits. Using an email analogy, current and planned DNSP capability to send flexible network limits or backstop instructions to customer devices represent a 1:1 'To' field while the CER Data Exchange will efficiently add a complimentary 'CC' field to extend visibility of dynamic limits to other parties without compromising the primary control loop.	- Stakeholders are supportive of this use case with the goal of increasing network utilisation within the next 5 years. - Stakeholders noted that whilst CSIP-Aus exists as a communication standard, the current state to give visibility to multiple aggregators and retailers does not. - Stakeholders highlighted that utility servers on their own do not have the ability to manage access rights, therefore a complimentary solution is needed. - Stakeholders identified that benefits of this use case include reduced constraints for customers and increased network utilisation. - Further, allowing broader aggregator and retailer visibility of forecast and historical DOE data through a common integration point will increase efficiency at scale and support product development and tailoring to customers.
2. Grid Data Collaboration	Facilitate the sharing of aggregate system operation data between AEMO and network service providers. Potential benefits include improved	- Stakeholders did not see this as urgent for the Exchange. However, if it proceeds, suggestion was to start small via enhance / use existing systems immediately or within five years depending on EV uptake and defined consequences.

Use case	Description	Stakeholder feedback
	operational awareness, and support for grid performance optimisation.	- Stakeholders noted that this use case is dependent on progress of system integration and standards. It is important to create common and open ways of communicating data but need to ensure they integrate with new and old systems. - Stakeholders emphasised the need to ensure collaboration is inherently linked to customer value-stacking and system security benefits through greater operational visibility.
3. Scaling Dynamic Network Pricing	Share dynamic network prices in a standardised way, at scale, across multiple DNSP jurisdictions. This option may incentivise greater local network utilisation with higher levels of scalability, consistency, and economies of scale.	- Stakeholders expressed the need to enhance and standardise existing connection processes to enable uniform capabilities with high compliance. - Stakeholders referenced Project Edith and mentioned that whilst it is still at small scale, there is an opportunity for other DNSPs to replicate, experiment and adapt. - Stakeholders have said they need more clarity on the issues and limitations with existing systems to manage pricing responsive signals. A CER Data Exchange was seen as not required for this use case at present, given dynamic network pricing is in concept development / trial phase. Defining a standardised implementation should be the immediate priority.
4. Supporting Local Network Services	Procurement of CER-based flexibility services is an emergent solution to managing network congestion and constraints without physically building new or augmenting existing network infrastructure. The Exchange could support with a high-trust ecosystem and standardised transactions to scale the trade of these services. This use case could support data exchange during parts of the service lifecycle, including the discovery, registration, triggering, and delivery verification.	- Stakeholders are broadly supportive of this use case, seeking immediate implementation of new platform. - New systems and capability would likely need to be further developed within Network businesses to initiate this use case. - It was noted uptake of local network services is low and biased towards incumbents due to standardisation and fragmentation. - Stakeholders highlighted the need for two-way information flow. There are too many players and too many ways of orchestrating: “we need to build a gateway for communication”. - Stakeholders noted that currently limited value is shared with customers. The CER Data Exchange would provide more parties with opportunities to provide these services and promote competition.

Use case	Description	Stakeholder feedback
Market Efficiency & Performance		
5. Accessibility of Market Prices	Broadcast price forecasts and clearing prices to a wide range of organisations, including non-market participants. This option can enhance decision-making, foster new services and create a more transparent competitive market at lower cost. Formerly referred to as "Transparency of Market Prices" in Workshop 2.	- Stakeholders considered this use case would provide immediate value but is not necessarily a priority issue for the CER Data Exchange where simpler solutions exist. - Stakeholders considered this use case a key enabler of market activity and CER optimisation / value stacking. However, stakeholders raised concerns relating to parties 'gaming the system' and the potential for, in adding this use case to existing systems, the onboarding process acting as a barrier for smaller players.
6. Flexibility Service Requests	Retailers broadcast flexibility requests to Virtual Power Plants (VPPs) across their entire customer base via a common interface. Potential benefits include providing access to more CER flexibility, creating more value-stacking opportunities for consumers, enabling efficient price responses for Retailers.	- Stakeholders noted the overlap between this use case and the local network services support and sharing network limits use cases. Further, some stakeholders considered although aggregators have some capabilities in this field, uplift is important for increased visibility and understanding of the market, but immediate implementation is not a priority. - Stakeholders voiced the need for fast and consistent data and highlighted that the energy market needs to become more reliant on cost reflective pricing and requests for emergency demand response.
7. Streamlined CER Portfolio Data Access	Provide a secure way to share and access 'source of truth' CER capabilities and commitments to access many opportunities. This option can dynamically provide transparency about CER asset portfolio registrations, credentials and changes without duplication.	- Stakeholders highlighted that whilst the DER Register may be an option, it is not available to all parties and does not record all assets (eg, EVs, A/C, hot water, demand flexible resources). - Stakeholders valued streamlined customer switching for VPP / aggregators services, and avoid duplication of information, key benefits of this use case. - Stakeholders considered a 'stepped approach' to this use case would be more appropriate.
Customer, Asset, & Actor Records		
8. Visibility of CER Customer Choices	CER customer choices are recorded and shared with relevant organisations (with correct access rights and consent) in the ecosystem. This option can improve switching service providers, introduce innovative	- Stakeholders considered that visibility of CER configurations could support choices for new homeowners, switching customers and communicate preferences of CER use by aggregators. However, noted that customers are wary of sharing data which would need to be addressed in reforms.

Use case	Description	Stakeholder feedback
	products/services, and ensure consistent data availability at less cost and risk.	- Although stakeholders recognised this use case can enable more tailored products to customers and offer seamless preferences across multiple agents and services, ensuring customer data privacy was a clear non-negotiable.
9. Consistent CER Standing Data	Expand and dynamically reflect CER standing data changes, such as firmware updates, across organisations in a secure and auditable way. Potential benefits include simplifying operational planning, improving service registrations, and proving compliance with standards once.	- Stakeholders considered that current processes including manual registration, reliance on DER register and incomplete data sets, requires uplift. - Although stakeholders saw value in this use case and it could be implemented immediately, the improving the operational state of devices is currently a higher priority. - Stakeholders highlighted that this use case could lead to price discovery for products that are verified and certified across networks and states. It would enable retailers to understand consumer characteristics to offer better deals, market customer-specific plans, and lower cost for OEMs to participate.
10. Support EV Uptake and Integration	Support EV integration with dynamic registration, visibility of infrastructure (eg, public chargers) and market access. This option can enable seamless, market-wide participation for consumers and EVs.	- Stakeholders voiced that currently customers do not have sufficient visibility of charger reliability, charger operating capacity, dynamic pricing, and “you can’t optimise what you can’t see”. - However, this use case did not receive significant support with stakeholders noting other immediate priorities in relation to EVs. - It was noted the alternative of uplifting the DER Register to include EV data would not effectively support dynamic data and access is limited.

Stakeholder Preferences

Based on the outcomes from the co-design workshops and subsequent consultations, stakeholders reached a broad consensus on the need for improved data-sharing infrastructure to support the integration and optimisation of CER. Priority was given to use cases that enhance operational efficiency, support network flexibility, and provide immediate, tangible benefits. Industry preferences reflect a practical, phased approach to implementation while considering the future scalability of the CER Data Exchange (Figure 17).

Figure 17: Use Case Preferences – Workshop 2

Use case	Table Sentiment	Timeline	Build option	Complimentary Groupings
1. Sharing Network Limits	Priority	Within next 5 years	Extend	▲
2. Grid Data Collaboration	Some value, but not urgent	Within next 5 years	Extend	▲
3. Scaling Dynamic network pricing	Less value, subject to detail	5 years +	Extend	◆
4. Supporting Local Network Services	Priority	Immediately	New	◆
5. Transparency of Market Prices	Less value, subject to detail	Within next 5 years	Extend	◆
6. Flexibility Service Requests	Some value, but not urgent	Within next 5 years	Extend	◆
7. Streamlined CER Portfolio Data Access	Some value, but not urgent	Immediately	Extend	⬢
8. Visibility of CER Customer Choices	Some value, but not urgent	Within next 5 years	New	⬢
9. Consistent CER Standing Data	High value	Immediately	Extend	⬢
10. Support EV Uptake and Integration	Less value, subject to detail	Within next 5 years	Extend	

Groupings are based on the complimentary capabilities and features which would be used in an exchange to implement these use cases.

Priority Use Cases

Of the options presented, stakeholders identified Sharing Network Limits, Supporting Local Network Services, and Consistent CER Standing Data as high-priority use cases. These are seen as crucial for optimising network usage, enhancing local network service offerings, and ensuring accurate data for operational coordination and compliance needs. Participants said these use cases should be implemented immediately or within the next five years to address current gaps in the market and provide foundational value to stakeholders.

Strategic Value Use Cases

While the priority use cases form the core of the CER Data Exchange, stakeholders also recognise the complementary benefits of additional capabilities. Use cases like Visibility of CER Customer Choices and Streamlined CER Portfolio Data Access were noted as valuable, though not urgent. These use cases offer potential for greater customer engagement, support for switching, and improved data consistency. Participants expressed that addressing these use cases over time will add depth and flexibility to the Exchange, enhancing its adaptability for evolving market needs.

Through the co-design process, stakeholders broadly preferred an initial narrow focus on core functionality to manage risk and cost – while leaving room for expansion and this is reflected in the priority and strategic use cases above. This is also in line with the feedback received around the design and governance of the CER Data Exchange.

4.3 Shortlisted Options – Use Case Functionality

Priority Use Cases

The priority use cases for the CER Data Exchange, preferred by stakeholders in Workshop 2, emphasise a delivery bias to both immediate benefits (‘quick wins’) and building a strategic foundation for future use cases. These use

cases (Table 2) provide immediate benefits to all organisations – such as enhanced network visibility, efficient local service coordination and consistent CER data handling, and build capabilities that future strategic use cases can leverage. Although some individual organisations may benefit more than others, we consider these use cases will achieve significant industry benefits that will flow through to consumers.

These priority use cases establish core functionalities in the CER Data Exchange that are essential for expanding to more complex use cases in the future. For example, *Sharing Network Limits* and *Consistent CER Standing Data* provide baseline interoperability and data integrity, supporting future use cases involving dynamic pricing, advanced DER interoperability, and consumer choice visibility. By implementing these priority use cases, the Exchange develops a scalable infrastructure that can accommodate evolving CER technologies and support innovative consumer services, fostering a resilient and consumer-focused energy market.

Table 2: Proposed Priority Use Cases[9]

Priority Use Case	Description	Capabilities
Use Case 1: Sharing Network Limits	Provides authorised agents with visibility of network constraints across jurisdictions, supporting more efficient grid management and operational planning. **Aim**: Addresses current inefficiencies due to limited access visibility of grid constraints by multiple parties.	- **Platform Interoperability** for consistent, standardised data formats. - **Access Management** to control secure, role-based access
Use Case 2: Supporting Local Network Services	Enables local network operators and service providers to coordinate local CER-based flexibility services in high-demand areas by accessing shared data on local grid status. **Aim**: Reduces localised congestion, potentially deferring network augmentation and improves CER integration, optimising network support services where needed most.	- **Real-Time Processing** for immediate data updates. - **Platform Interoperability** to ensure compatibility across various systems and actors.
Use Case 3: Consistent CER Standing Data	Establishes a common point for agents to access and share verified CER asset data, ensuring data consistency across stakeholders. **Aim**: Reduce operational inefficiencies and supports planning by providing a common access point for accurate, up-to-date CER information.	- **Format Standardisation** to align CER data formats for consistency. - **Advanced Data Validation** to ensure quality. - **Information Security** for data privacy.

Strategic Use Cases

Several 'Strategic Use Cases' were identified by stakeholders at Workshop 2 (Table 3). Although not seen as immediate priorities, these use cases were recognised as having complementary benefits that enhance the effectiveness and scalability of the CER Data Exchange. Each strategic use case builds on the functionalities developed for priority use cases, enabling future-focused capabilities that add value to existing data-sharing

[9] Note that the functional capability and proposed infrastructure outlined in the table below are only representative and not an exhaustive list.

operations. These use cases are grouped to reflect their complementary nature with the priority use cases, fostering a foundation for broader, long-term CER integration.

Table 3: Proposed Strategic Use Cases

Strategic Use Case	Description	Functional Capabilities
Grid Data Collaboration	Facilitates collaboration between AEMO, DNSPs, and other relevant stakeholders by sharing aggregate grid operations and forecast data. **Aim**: This enables improved grid performance, planning, and operational awareness, complementing the *Sharing Network Limits* use case for a comprehensive view of grid constraints and capacity.	- **Platform Interoperability** for standardised data sharing across stakeholders. - **Access Management** for secure, role-based data access.
Flexibility Service Requests	Enables retailers to broadcast flexibility requests to their customer base, fostering enhanced coordination of CER in response to market prices. **Aim:** Complementary to *Supporting Local Network Services*, this use case supports an additional value stream for the optimisation of CER to deliver customer benefits, supporting CER integration and enabling flexibility in service offerings.	- **Real-Time Processing** for rapid dissemination of service requests. - **Platform Interoperability** to align different service platforms.
Visibility of CER Customer Choices	Provides visibility of CER customers' choices regarding usage preferences and configuration. **Aim:** This use case complements *Consistent CER Standing Data*, allowing service providers to better understand consumer preferences and support personalised service offerings, promoting consumer empowerment and engagement.	- **Access Management** to ensure secure access to consumer data. - **Format Standardisation** for consistent customer preference data. - **Information Security** for data privacy.
Streamlined CER Portfolio Data Access	Establishes a streamlined access point for CER portfolio data, including asset registrations and credentials, providing an up-to-date repository that enhances data consistency. **Aim:** This use case complements *Consistent CER Standing Data* by offering efficient, streamlined access to CER relationship and service capability information for various stakeholders.	- **Format Standardisation** for consistent data formats across stakeholders. - **Advanced Data Validation** to support data accuracy and reliability. - **Information Security** for data integrity and privacy.

These strategic use cases underscore the long-term vision for the CER Data Exchange as a scalable, flexible system that supports future advancements in CER data integration. Together with the priority use cases, these strategic initiatives may provide a comprehensive framework for enhancing grid management, fostering consumer empowerment, and streamlining data access across the Australian energy landscape. We note however that these are not the only use cases that could be potentially used by the CER Data Exchange and seek additional feedback

from stakeholder on these and other potential high value of additional use cases not listed. A long list of use cases is outlined in Appendix A4.1 to support stakeholder consideration.

Stakeholder-led Use Cases

Through our consultation, the Clean Energy Council (CEC) highlighted a challenge with jurisdictional inconsistency, duplicative testing and compliance processes, and the fragmented approach to implementing network limits. The CEC is interested in exploring how the CER Data Exchange could create a unified system that supports streamlined certification, product testing, and the development of a national register of approved CER products, benefiting both industry and consumers. Table 4 provides an interpretation of the CEC proposed use cases.

Table 4: Stakeholder-led Use Case

Stakeholder Led Use Case	Description	Functional Capabilities
Network Limits Standardisation *Complementary value-add to Use Case 1: Sharing Network Limits*	While DNSPs have adopted CSIP-Aus as a common protocol for CER control, implementation of dynamic network limits (DOEs or Flexible Export limits) is subject to jurisdictional differences relating to the granularity and frequency of the limits which potentially complicates integration by technology providers across jurisdictions. This use case considers using the CER Data Exchange to present dynamic network limits from different networks using a common model, promoting seamless integration, without enforcing uniform specifications within DNSP systems in the granularity or update frequency of dynamic limits. This use case extends Priority Use Case 1. **Aim**: Avoid a potentially lengthy industry-wide standardisation process and provide DNSP format flexibility whilst reducing interface cost and time for 'customer agents' and/or OEMs using a commonly agreed format.	- **Platform Interoperability** for standardised data sharing across stakeholders. - **Access Management** for secure, role-based data access. - **Real-Time Processing** for rapid dissemination of service requests.
Support Common CSIP-Aus Testing and Certification *Complementary value-add to Use Case 1: Sharing Network Limits*	Allow organisations such as OEMs to access testing and certification environments for CER devices such as Solar and Battery inverters and Electric Vehicles via a common, authenticated data platform. As DNSPs and the industry move to common testing, certification, encryption, and authentication (PKI) arrangements, a common, secure and reliable method for accessing device testing and certification services via the CER Data Exchange may reduce costs for OEMs in ensuring their new devices and CER client software versions are approved for use without delay. It will also allow the industry more flexibility in engaging testing and certification service providers by	- **Platform Interoperability** for consistent, standardised data formats. - **Access Management t**o control secure, role-based access

Stakeholder Led Use Case	Description	Functional Capabilities
	removing the competition barrier caused by bespoke integration. This is particularly relevant as more jurisdictions adopt and require compliance with CSIP-AUS inverter standards and implement backstop and flexible export capabilities. **Aim:** Reduce industry cost by supporting standardised product testing arrangements using a consistent, nationally recognised testing arrangement that all OEMs can access. This could expand to other protocols for testing and verification of CER device performance and available to organisations with appropriate role-based access.	- **Format Standardisation** for consistent data - **Advanced data validation** to ensure data quality
National CSIP-Aus Certification Register *Optional value-add to Use Case 3: Consistent CER Standing Data*	In addition to the above use case, the Exchange will allow the establishment of a common "live" register of all CSIP-Aus certified products where test records and compliance status to future CSIP-Aus updates can accessed through the CER Data Exchange's trusted ecosystem by various stakeholders. This will streamline the onboarding process for new devices and software client versions for OEMS and DNSPs. **Aim:** To ensure that the services and functionality tested and certified are rapidly recognised in all Australian network jurisdictions, reducing delays in assessing and approving devices for use on our networks and improving experiences for installers and customers.	- **Platform Interoperability** - **Access Management** - **Format Standardisation** - **Advanced data validation**

Consultation Questions

1. **Priority Use Cases:** Do the identified priority use cases effectively address immediate data-sharing needs, and are there any additional use cases you would recommend prioritising?
2. **Strategic Use Cases:** How do you view the long-term value of the strategic use cases and are there specific outcomes you would like these use cases to achieve in the future? Also do the strategic use cases sufficiently complement the priority use cases? Do you have any feedback on when these use cases should be implemented?
3. **Additional Use Cases:** Are there additional or alternative use cases that would enhance the CER Data Exchange's outcomes?
4. **Changes to Use Cases:** Would you suggest any changes to the use cases presented? Please outline your reasoning.

5 Data Sharing Capability

This chapter examines the core data sharing capability necessary to facilitate efficient, secure, and interoperable data-sharing between stakeholder organisations. It highlights the foundational infrastructure required to support both essential and optional capabilities, focusing on the mechanisms to ensure data reliability, privacy, and compliance with regulatory standards.

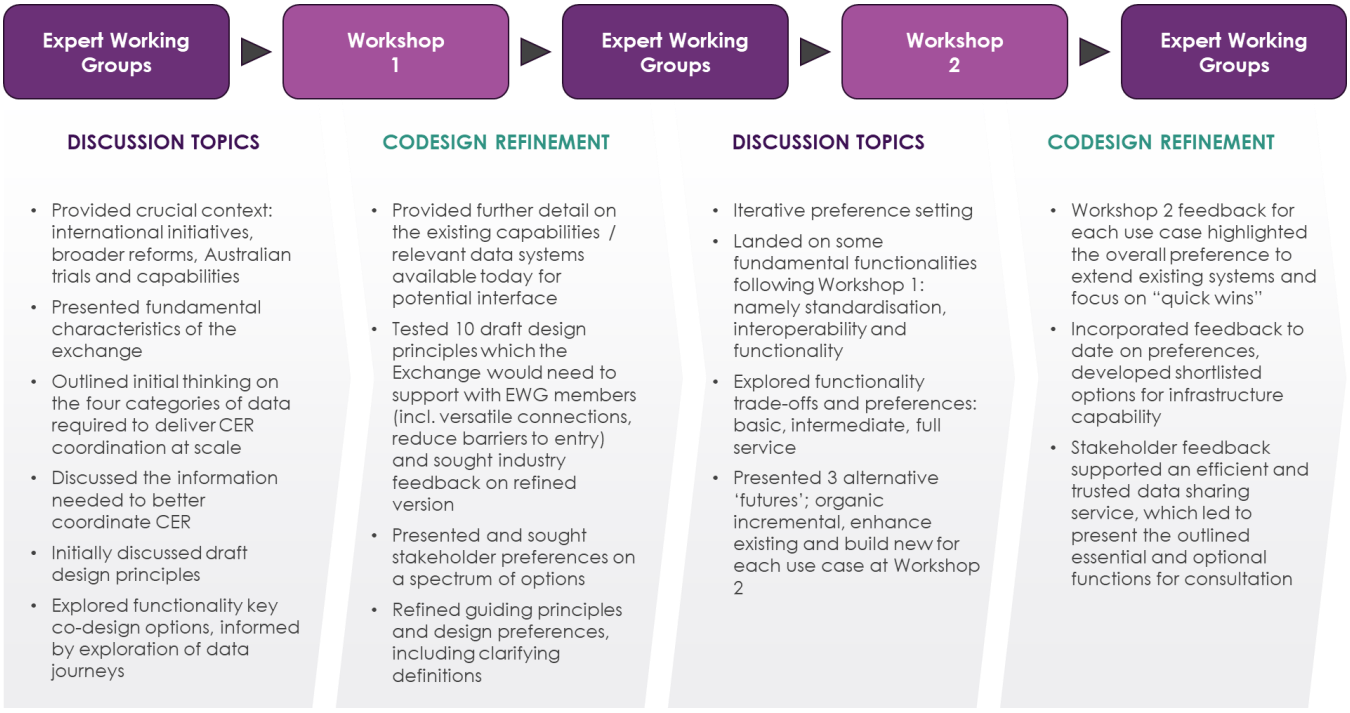
The assumption is that the data sharing capability of the CER Data Exchange will function as a commonly shared service accessible to all organisations with (validated) access rights, allowing them to securely exchange and utilise data in various ways. The objective is to reduce duplication through numerous point-to-point configurations and create a scalable service that can be tailored to deliver on the unique needs of each use case.

In the context of the use cases, stakeholder feedback is sought on the data sharing capability required from a CER Data Exchange. It is not assumed that all data sharing capability listed would need to be supported by the Exchange.

5.1 Co-design refinement summary

Figure 18 provides an overview of the co-design journey undertaken by the Expert Working Groups and industry stakeholders in workshops. It summarises key discussion topics and iterative refinements, illustrating how stakeholder engagement shaped the data sharing capability preferences for the CER Data Exchange.

Figure 18: Co-design Refinement Stages



5.2 Stakeholder Sentiment

Throughout the co-design process thus far stakeholders have considered design preferences in the context of use cases, trade-offs and the data sharing functionality required.

Focus on 'quick wins' and allow for adaptability

Throughout the co-design process, we have worked with stakeholders and the EWG to develop preferences for key data sharing capability for the CER Data Exchange. Stakeholders broadly preferred the design for the CER Data Exchange to start with a narrow focus to accelerate implementation of near-term use cases and to manage implementation risks and costs. However, stakeholders also stressed that the CER Data Exchange needs to be flexible and allow for increased functionalities over time to cater for a wider set of use cases. This feedback has been reflected in Chapter 4 in the shortlisting of Use Case functionality and the categorisation of Priority and Strategic Use Cases.

Enhance or Build New Capability

The preferred approach among stakeholders for establishing the CER Data Exchange was largely focused on extending existing systems where possible, as a cost-effective means to build upon already established infrastructure (see Appendix A1 further details on the existing capability options). By leveraging existing capabilities, stakeholders emphasised that it is essential to address privacy considerations, implementation costs, and the depth of use before advancing with this model.

While there is support for extending current systems, other options for the CER Data Exchange were considered, each providing alternative paths to address data-sharing challenges:

1. **Organic Incremental Approach:** This option mirrors existing arrangements with minimal adjustments to current data-sharing architectures, primarily relying on point-to-point exchanges with limited standardisation. Though it avoids additional investment and minimises organisational impacts in the near term, industry stakeholders would still depend on various intermediary data-sharing systems. Reform initiatives would require unique solutions integrated on a case-by-case basis, maintaining legacy systems with minimal change.
2. **Enhance Existing Capabilities and Systems:** Building upon current data arrangements by adding capabilities to address gaps, this approach involves retaining some legacy infrastructure but necessitates technical remediation to align with common data-sharing needs identified in the CER Data Exchange co-design process. This model would involve upgrading or 'wrapping' legacy systems to interoperate with new features, thereby maximising returns on existing investments. However, the effort to coordinate, establish, and sustain these changes may lead to additional investment and extended timelines.
3. **Create a New Data Exchange:** This approach proposes the development of a stand-alone bespoke data exchange, designed specifically to meet CER data-sharing needs. Establishing a new platform from the ground up could yield a strategic, fit-for-purpose solution. This option would be additional to other existing industry system uplift initiatives for non-CER uses and require the construction of "bridges" to maintain connections with legacy systems, ensuring continuity while introducing a scalable, modern data-sharing framework.

To support decision-making, stakeholders have stressed the importance of a practical, flexible governance model and prioritisation of capability to support priority use cases.

5.2.1 Stakeholders Preferences

Table 5 outlines various potential capabilities of the CER Data Exchange, defining each capability while highlighting key trade-off decisions. Stakeholder preferences reflect a strong focus on balancing these trade-offs to ensure secure, reliable, and scalable data-sharing, while allowing flexibility for innovation, inclusivity, and cost management.

Table 5: Summary of Stakeholder Design Preferences

Capability	Definition	Trade-offs	Stakeholder Preferences
Information Security	Information security ensures data is protected from unauthorised access, breaches, and tampering, maintaining its confidentiality, integrity, and availability.	Balancing high-security measures with user experience and system efficiency is a challenge. Increased security, such as encryption and rigorous audits, adds to complexity and costs. Ensuring data privacy and meeting regulatory standards is non-negotiable, yet stakeholders expressed concern that overemphasizing security could impact system usability and data accessibility. Achieving a tailored approach that provides adequate protection without undermining efficiency is crucial.	- High priority to ensure data protection and trust. - Tailored security approaches that balance protection and operational efficiency are essential. - Role-based access and encryption considered vital to align with compliance requirements. Strong privacy measures are recommended without overcomplicating the process.
Format Standardisation	Format Standardisation is the use of common formats, protocols, and practices to ensure data consistency, interoperability, and system efficiency.	Standardisation is fundamental for compatibility and ease of integration across platforms, ensuring consistency and lower costs. However, there is a need for a balance between strict adherence to standards and allowing flexibility for custom formats to address unique use cases. Strict standardisation could stifle innovation and limit the ability of stakeholders to adapt to emerging needs. On the other hand, too much flexibility may create inconsistencies and reduce the benefits of standardisation through the CER Data Exchange.	- Stakeholders suggested alignment with international standards like IEC and IEEE for consistency. - Emphasised flexibility to cater to specialised use cases where deviations are necessary. - Reducing implementation costs and ensuring compatibility were seen as key benefits of standardisation. Prioritised balance between standardisation and flexibility to foster innovation.
Access Management	Access Management is the controls and authorisation of who can access, use, or share data, based on roles and permissions.	Role-based access management is considered fundamental to ensure secure data sharing while limiting administrative burden. Implementing access based on roles simplifies management and aligns with privacy needs but may lack the granular flexibility needed for diverse use cases. More granular access control could improve customisation but adds complexity and costs.	- Stakeholders prioritised role-based access to align with privacy standards and limit complexity. - Consent management was highlighted as crucial to maintaining trust and regulatory compliance. - Balance needed between flexibility and simplicity for effective access management.

Capability	Definition	Trade-offs	Stakeholder Preferences
		Consent tracking was highlighted as an important feature, though integrating it effectively without compromising system simplicity is challenging.	- Security and transparency in user access were fundamental to building trust. - Avoid over-complicating access mechanisms to maintain usability.
Platform Interoperability	Platform Interoperability is the ability of the data exchange to integrate and work seamlessly with other industry systems, while voluntary integrations can encourage a flexible approach for less critical use cases.	High interoperability supports smooth integration across diverse platforms, enhancing the value of the data exchange. Enabling voluntary integrations lowers entry barriers, allowing phased participation, which increases inclusivity. However, enforcing interoperability standards across all functions may create barriers for smaller participants, stifling innovation. There is a trade-off between mandating interoperability for core functions to ensure consistency and allowing voluntary adoption for less critical areas to encourage participation without high entry barriers. Balancing standardisation with flexibility could maximise participation while maintaining key data flows.	- Stakeholders viewed mandatory interoperability for core use cases as necessary for consistency. - Flexibility for less critical functions encouraged to promote broad participation. - Concerns were raised about potential data inconsistencies if standards are not met. - Integration with existing platforms seen as key to reducing redundancy and improving system adoption. - Balance between standardisation and flexibility highlighted to support smaller participants. - Ensuring consistent data flows was seen as fundamental.
Advanced Data Validation	Advanced Data Validation is the process of automatically checking data for consistency, and completeness before it is shared or processed, ensuring high data quality and reliability.	Advanced data validation enhances reliability, ensuring high data quality, particularly as data volume grows. However, implementing it from the outset may introduce significant complexity and costs, which may not be warranted for all use cases. A phased approach was recommended, starting with basic validation and scaling up as the Exchange and its use cases evolve. This approach balances the need for accuracy with initial implementation feasibility.	- Stakeholders recognised the value of advanced validation, especially as data volume grows. - Immediate need for advanced validation was questioned; a phased approach was preferred. - Emphasis on starting with basic validation to avoid initial complexity. - Phased scaling to advanced capabilities recommended based on evolving needs. - Ensuring data reliability without overburdening the system was prioritised.

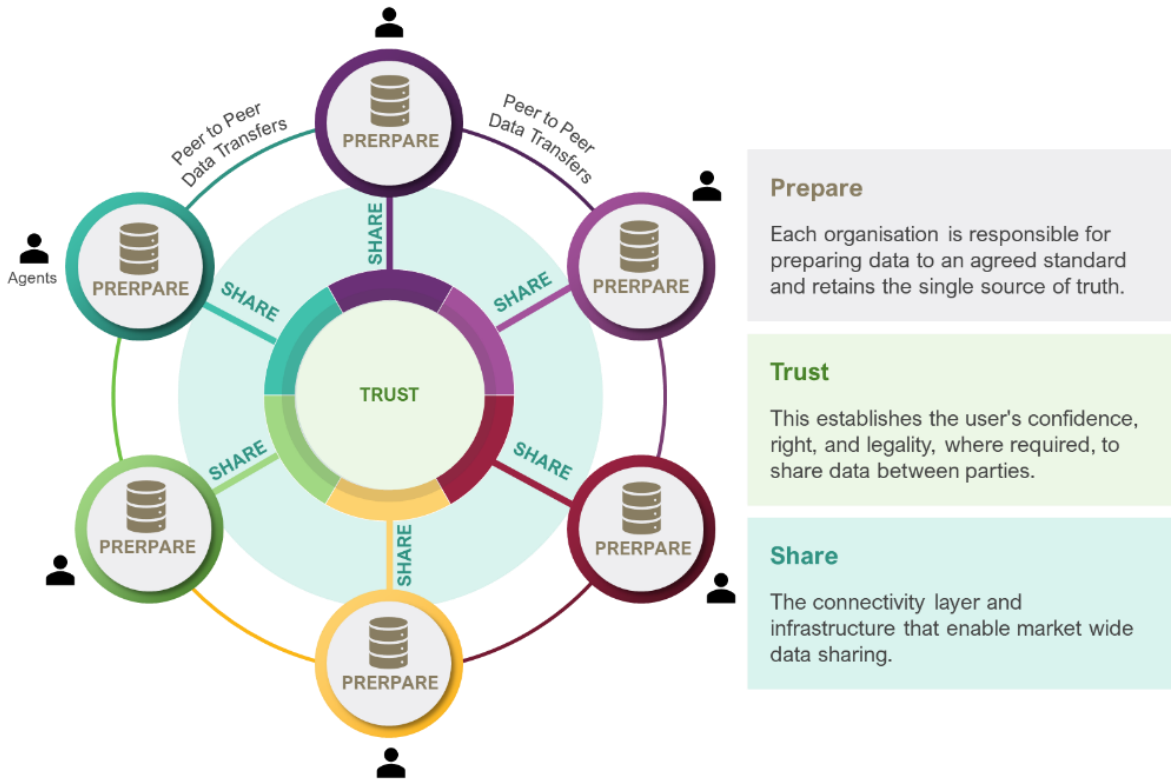
Capability	Definition	Trade-offs	Stakeholder Preferences
Custom Data Formats	Custom Data Formats is the flexibility to create unique data structures tailored to specific use cases, allowing organisations to meet specialised requirements that may not align with standard formats.	Custom formats provide flexibility and adaptability for unique cases, allowing stakeholders to innovate and respond to niche needs. However, this flexibility risks fragmentation, complicating integration and leading to higher maintenance costs. The challenge is to find a balance between enabling custom formats for innovation and maintaining enough standardisation to ensure efficient data exchange and broad compatibility. Stakeholders generally favoured maintaining standardisation as a base, while permitting exceptions under controlled scenarios.	- Stakeholders supported custom formats for unique needs but stressed maintaining a base standard. - Concerned about fragmentation and increased complexity. - Suggested allowing exceptions to standard formats in specific cases to support innovation. - Balance between broad compatibility and tailored solutions was emphasised. - Ensuring alignment with broader standardisation goals remained a priority.
Batch vs. Real-Time Processing	Batch vs. Real-Time Data Processing relates to the option to handle data either in periodic batches or instantaneously, with batch processing being cost-effective for routine data and real-time processing suitable for time-sensitive operations.	Real-time processing is crucial for high-priority, time-sensitive use cases but adds complexity and cost. Batch processing is sufficient for routine tasks, helping to manage costs and reduce system demands. Implementing real-time capabilities from the outset could create unnecessary burden, while a phased approach allows for prioritisation based on evolving needs. Balancing the immediate need for real-time capabilities with the practicality of batch processing was a major consideration for stakeholders.	- Real-time processing seen as critical for certain high-priority use cases (see Chapter 4). - Batch processing preferred for non-critical, routine data to manage costs. - Stakeholders supported a phased approach to balance cost and system complexity. - Stakeholders emphasised the need to start with batch processing to manage resource requirements. - Real-time processing to be introduced as demand and capabilities evolve.

5.3 Shortlisted Options - Infrastructure Capability

Overall, a common, shared infrastructure for the CER Data Exchange aims to provide an effective foundation for securely connecting stakeholders, facilitating cost-effective integration, and promoting equitable data access across Australia's energy market.

Building on the use case preferences outlined in Chapter 4, the proposed data sharing enabling infrastructure required to support the efficient and trusted data sharing services of CER data will need to be supported by the Prepare, Trust and Share framework considered in the UK Digital Spine Feasibility (Figure 19).

Figure 19: Data sharing ecosystem[10]



The CER Data Exchange will not be the only way to share data. However, it may provide services to support data transfers as required (e.g. Role Based Access Control). The proposed data sharing infrastructure components are outlined below.

Proposed Data Sharing Capability

Table 6 outlines the possible capabilities for the CER Data Exchange. The functionalities listed contribute to meeting core operational, security, and regulatory needs, and those that provide enhanced flexibility and specialisation for specific use cases.

[10] Diagram adapted from UK Digital Spine Feasibility Study

Table 6: Proposed Data Sharing Capability

Capability	Purpose	Outcome
Information Security	Protect data from unauthorised access, breaches, and tampering, ensuring confidentiality, integrity, and availability.	Ensuring the Exchange meets global security benchmarks
Format Standardisation	Uses international and common data formats, protocols, and practices to ensure data consistency, interoperability, and efficiency across platforms.	To ensure efficient interoperability while supporting expansion across future platforms.
Data Governance	Framework to securely manage data according to regulatory requirements and quality standards, supporting accuracy, privacy, and compliance across all data-sharing activities.	Ensures data sharing aligns with privacy laws, improving trust and quality in line with ISO and maintaining accountability in data-sharing.
Access Management	Controls who can access, share, and manage data based on defined roles and permissions, ensuring data security and efficient system operation.	Leverage AEMO's systems (e.g. IDAM) to meet international access security standards, optimising security and compliance.
Platform Interoperability	Enables seamless integration with various energy systems, ensuring cross-platform functionality for effective data exchange.	Platform interoperability is essential for multi-system connectivity, ensuring efficient communication between platforms, aligning with global and local standards.
Advanced Data Validation	Provides agents with options to check data quality, accuracy, and completeness before data is shared, supporting data integrity without the Exchange managing the data.	Enhances reliability in CER operations, supporting systems with frequent or complex data exchanges.
Custom Data Formats	Allows for unique data structures tailored to specific use cases, supporting non-standard requirements where interoperability is less critical.	Accommodate custom data formats, the Exchange supports a wider range of use cases while maintaining core interoperability for essential data standards.
Batch vs. Real-Time Processing	Support both periodic (batch) and immediate (real-time) data-sharing, depending on operational needs and without directly processing data.	Flexibility in data-sharing timing to meet diverse needs and support cost-effective options.

Stakeholders have discussed differentiating the data sharing capability of the exchange during the co-design process. Capabilities such as information security, access management and platform interoperability could be considered as essential for building a secure, consistent, and reliable exchange. In contrast, capabilities like advanced data validation, and custom data formats may be considered optional as they offer added adaptability for less critical functions and specialised requirements. This distinction enables targeted investment in priority use

cases, ensuring core stability of the CER Data Exchange, while allowing flexibility for future enhancements and evolving market needs.

The starting assumption is that CER Data Exchange will act solely as a data-sharing 'facilitator' rather than a data processor. The Exchange would need to support, at a minimum, the 'essential' capabilities with the assumption that all data storage, processing, and management remains the responsibility of the Exchange users (e.g., network operators, Retailers, aggregators, and other service providers). This framework ensures that the Exchange functions in a neutral, interoperable way where stakeholders can share and access critical data in a secure, standardised format while maintaining control over data handling and compliance within their respective systems.

Consultation Questions

5. **Prioritisation:** Do you agree with industry preference that the CER Data Exchange should be designed with narrow capability initially but have the flexibility to expand in the future?
6. **Capability:** Do the proposed data sharing capability discussed above support both current and future CER data sharing use cases? Please nominate what essential data sharing capability would be required?
7. **Additional Features:** What additional features or capabilities could improve flexibility and scalability in the CER Data Exchange?

6 Ownership, Operations & Oversight

This chapter considers the foundational aspects of the CER Data Exchange – examining the various models for ownership, operational management, and regulatory oversight of the Exchange. The final option will likely shape the efficiency, scalability, and credibility of the CER Data Exchange.

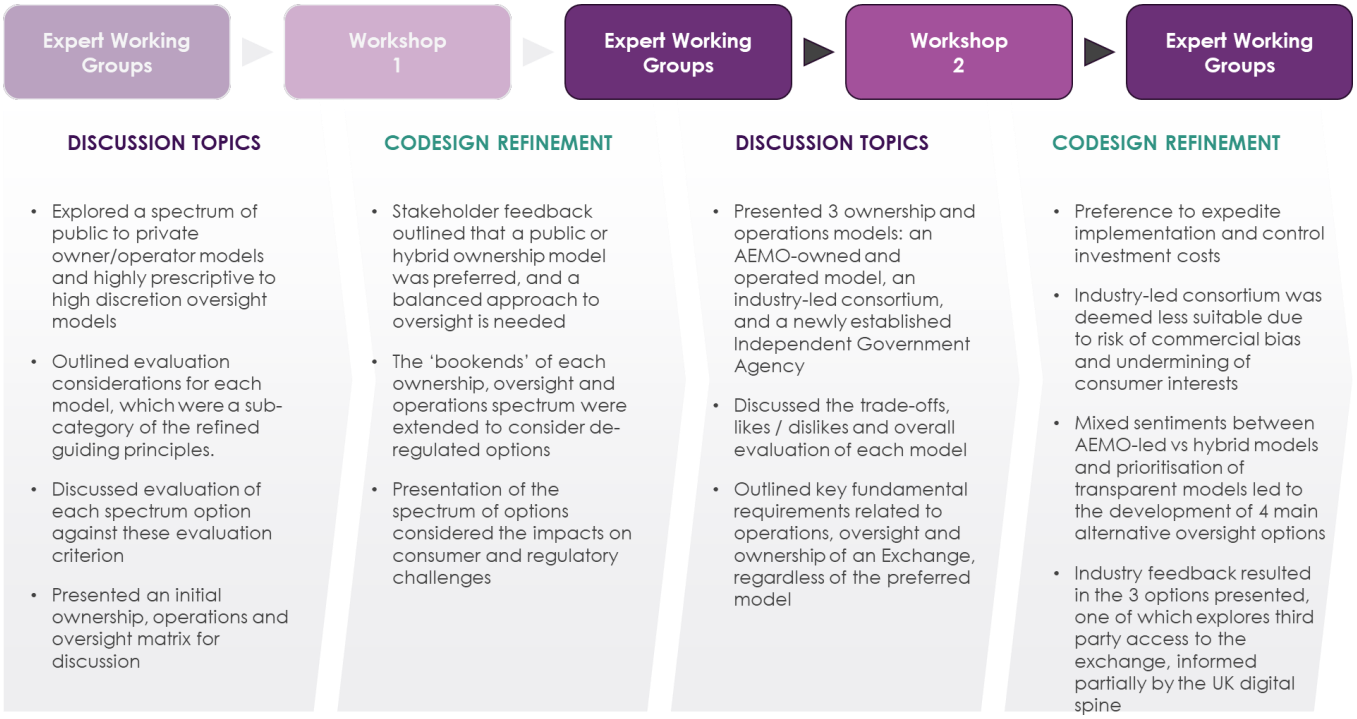
The ownership and operational models presented encompass diverse alternatives, each with respective trade-offs, from leveraging existing bodies and authorities to creating entirely new alternatives.

6.1 Co-design refinement summary

The co-design process has aimed to support stakeholders to assess potential ownership, operational, and oversight models for consideration. The options presented in this chapter incorporating the collective insights from stakeholder engagements to date, with particular emphasis on findings from Workshop 2. During Workshop 2, stakeholders underscored the importance of initiating the CER Data Exchange with a narrow focus and enhancing existing industry capability and systems to reduce upfront investment costs and expedite market implementation.

Figure 20 provides an overview of the inputs and refinement outcomes from the co-design process.

Figure 20: Co-design Refinement Stages



6.2 Stakeholder Sentiment

During Workshop 2, stakeholders evaluated three potential ownership models for the CER Data Exchange:

- Industry-Led Consortium owned and operated
- AEMO-led owner and operator model
- New Independent Government Agency model

Discussions revealed trade-offs between leveraging existing systems, operational agility, and maintaining public trust. Stakeholders saw the Exchange as a public good and strongly preferred public to avoid private commercial ownership, by either expanding AEMO's role or establishing an independent government agency, due to concerns preferences for about impartiality, transparency, and accountability. Public or hybrid ownership was seen as key to ensuring consumer interests are prioritised and avoiding commercial bias. The industry-led consortium model was generally viewed as less suitable, with concerns about commercial bias and the influence of larger market participants within the consortium.

Stakeholders were divided between the AEMO-led model, seen as efficient and familiar, and an independent agency, valued for its neutrality but raising concerns about high setup costs and bureaucratic inefficiencies. This feedback highlights the need for a governance model that balances transparency and flexibility with efficiency, ensuring the CER Data Exchange evolves effectively while maintaining public trust. A consistent stakeholder preference across all models was for industry involvement or consultation in the oversight function.

6.3 Ownership, Operations & Oversight

This section is divided into two parts:

- **Ownership and Operations**, which explores the potential models for the ownership and the operational framework of the CER Data Exchange.
- **Exchange Oversight**, which details the regulatory governance mechanisms applied to the Exchange to that will ensure transparency, accountability (prudence and efficiency), and alignment with stakeholder or consumer expectations.

6.3.1 Ownership and Operations

As the CER Data Exchange framework evolves, defining the optimal ownership and operational model is crucial to achieving a balanced, efficient, and equitable system that serves consumer outcomes and is workable for all stakeholders. Different models were evaluated based on their potential to support effective governance, cost distribution, consumer protection, and adaptability to market needs. Each model presents unique advantages and challenges, reflecting various stakeholder priorities such as innovation, impartiality, public accountability, and operational efficiency.

Table 7 outlines the three ownership and operational models considered and presented in Workshop 2 and explores stakeholder perspectives on each.

Table 7: Alternative exchange ownership and operations options under consideration

Options	Descriptions and stakeholder feedback
Model 1: **Industry-Led Consortium Model**	The industry-led consortium model was considered a more flexible approach, fostering innovation and potentially a wider distribution of responsibilities across industry participants. While this model could increase flexibility and responsiveness, stakeholders voiced concerns about potential commercial bias and unequal influence, as larger industry participants might dominate decisions to the detriment of smaller participants and consumers. This model's success would depend on establishing stringent regulatory safeguards to uphold impartiality, public accountability for cost recovery, and fair competition. Nonetheless, some stakeholders saw potential in this model for fostering innovation and flexibility in adapting to market changes.
Model 2: **AEMO-led Model**	Stakeholders showed a preference for an AEMO-led model, leveraging the existing and under development infrastructure (e.g. IDX) due to its operational efficiency and alignment with AEMO's role in the energy market. This model was viewed as practical and cost-effective, offering faster implementation by building on AEMO's established expertise. However, concerns were raised about potential operational bias, given AEMO's core responsibilities. Stakeholders emphasised that for this model to succeed, robust oversight mechanisms would be essential, including advisory bodies with broad industry representation, and customer advocates to ensure transparent decision-making aligned with public interest.
Model 3: **New Independent Agency Model**	The new agency model was discussed as the most impartial and consumer-focused option, with a mandate to serve public interest and provide comprehensive oversight. This model could ensure that CER Data Exchange operations are conducted independently and align with broader energy market objectives. However, stakeholders recognised that establishing a new agency would entail high initial costs, potential bureaucratic delays, and significant time establish an efficient operating model. While this model was seen as robust and fit-for-purpose, stakeholders were concerned that a new agency might lack the agility needed to keep pace with technological changes and evolving market demands. Trust and transparency were highlighted as strengths, however the model's complexity raised questions about its feasibility in the short term and whether political risk would impede its ongoing feasibility.

Stakeholder Preferences

Whilst the AEMO-led model emerged as a preferred approach due to its practical advantages, familiarity, and potential for immediate implementation, stakeholders stressed the need for a balanced oversight structure to mitigate potential biases and maintain trust in AEMO's role in the capacity as the CER Data Exchange owner and operator. The industry-led consortium was recognised for its potential to drive innovation but would require strong regulatory oversight to prevent commercial dominance and ensure public interest. The new agency model was seen as the most impartial and consumer-focused but was challenged by its setup costs and bureaucratic implications.

Even though stakeholders generally preferred either the AEMO-led or the New Agency model as a preference, some considered that all options should continue to be explored. Overall, there was a clear appreciation that regardless of the model, enhanced data governance and regulatory oversight should be established to ensure

transparency, regulatory safeguards, and assurance that broad stakeholder engagement is embedded in the CER Data Exchange operating model.

6.3.2 Exchange Oversight

Exchange oversight refers to the framework that guides the operation of the CER Data Exchange. An operational oversight framework could cover issues such as the roles and functions of the data exchange operator, performance specification and the degree in which the data exchange operator is able to make decisions pertaining to the operation of the Exchange. Exchange oversight is different to Data Governance which covers issues such as the type of data that is being exchanged and data integrity (Data Governance is discussed in Chapter 7).

Through the consultation process, stakeholders considered various models relating to two key aspects of exchange oversight:

- **Level of prescription**. This determines the level of discretion that the Exchange operator has in undertaking its everyday operation.
- **Oversight body and the form of the regulatory instrument.** Several potential organisations that could provide oversight were considered, noting that the oversight body would also determine the regulatory instrument used to provide guidance on the CER Data Exchange's operation.

Figure 21, Table 8 and Table 9 outline the options considered by stakeholders and their preferences for the level of prescription and oversight body respectively.

Figure 21: Level of prescription

This model generally requires a detailed and often legalistic instrument setting out key aspects such as the detail functions the exchange could perform and the decision-making process. The exchange operator has minimal discretion any changes to oversight arrangements and how the exchange operator performs its function must be made through the instrument.

AEMO's B2B eHub current operates under this model where Chapter 7 of the NER provides detailed guidance on key aspects of the B2B eHUB's operation.

This model provides the exchange operator significant level of discretion on how it discharges it functions. A high-level instrument may exist to provide principle-based guidance to the exchange operator.

The exchange operator may choose to develop its own procedures to provide guidance to users on operational aspects such as onboarding procedures and change requests.

Table 8: Oversight body and form of regulatory instrument

Potential organisations	Description and considerations	Potential regulatory instrument
Existing Regulators and Market Bodies	This model situates all oversight within established regulators, such as the AER and AEMC, providing stability, transparency, and alignment with the NEO or established legislative objectives. Using familiar structures offers industry confidence in fairness and consumer protections. However, this model may lack agility, making it challenging to quickly adapt to emerging needs or technological advances. Additionally, exclusive reliance on traditional regulatory bodies could place a high regulatory burden on the industry and limit proactive stakeholder input in decision-making	**Market Bodies**: NER, NERR and AEMO Procedures. **Other regulatory bodies**: legislation and/or regulations
New Government Authority	Establishing a new and dedicated authority would centralise oversight, with objectives and high-level decision-making guidelines embedded in law, providing flexibility for the authority to make encompassing decisions related to the Exchange. This approach allows for focused expertise and an agile response to evolving industry needs. However, the establishment of a new authority could involve high setup costs and slower implementation timelines. There are also potential risks around initial inefficiencies, bureaucratic delays, interpretation of high-level guidelines and the time required to build industry trust.	Legislation and/or regulation. Could be either new or amendment to existing legislation and regulations.
Self-regulated	A self-regulated model would allow the Exchange operator to independently set and discharge its functions, with minimal external oversight. This model offers high flexibility and streamlined decision-making, promoting innovation and responsiveness. However, stakeholders raised significant concerns about the risks associated with self-regulation, including reduced transparency, potential conflicts of interest, and a lack of accountability. Inconsistent oversight across jurisdictions and limited consumer protections were also flagged as critical risks under this model.	Company charter or constitution

Stakeholder Preferences

Exchange oversight model: Overall, stakeholders have expressed a preference for a balanced regulatory oversight approach model for the CER Data Exchange. Stakeholders emphasised the need for stability while supporting the flexibility needed to adapt to new market demands and use cases. Some stakeholders also commented that the appropriate oversight depends on the ownership model selected. For example, they consider private ownership of the Exchange would require more prescriptive oversight. Several participants in Workshop 2 commented that self-regulation is not appropriate for an enabling infrastructure such as the CER Data Exchange. Stakeholders acknowledged that while consultative approaches are more time consuming, they were far more preferable for supporting trust and transparency compared to a faster self-regulation option.

Efficient operation: Stakeholders also emphasise the need for the CER Data Exchange to operate as a public good in accordance with the National Electricity Objective (NEO). Stakeholders consider that the prudent and efficient operation of the data exchange will help maintain ongoing stakeholder participation and support.

Regulatory coordination: Stakeholders also stressed the need to align data exchange oversight with other CER related regulations to provide consistent investment and cost recovery mechanisms. Regulatory oversight of the CER Data Exchange must carefully balance investment in its functionality to support additional use cases with the potential burden on industry participants for interfacing with the Exchange. For example, where a licence obligation or regulatory requirement means a DNSP is required to exchange data through the CER Data Exchange, then it should have clear pathways to recover the efficient cost of doing so through its regulatory determinations. Additionally, a transparent cost recovery and pricing framework is essential to ensure that the Exchange remains accessible and equitable, avoiding undue costs to smaller market participants or consumers, while providing a fair mechanism for recouping development and operational costs.

Internal governance: In all models of ownership and operation, an internal governance structure of the CER Data Exchange will be essential for maintaining trust, accountability, and operational efficiency. Stakeholders emphasised a need to design clear governance roles, robust internal controls for data management and compliance, transparent stakeholder reporting, formal reference committees for stakeholder engagement, and a comprehensive risk and compliance framework. These elements will ensure effective internal oversight while supporting continuous stakeholder alignment and adaptability to emerging industry needs.

6.3.3 Shortlisted Options - Ownership, Operations & Oversight

Consideration is being given to three Ownership, Operations, and Oversight models for managing the CER Data Exchange, with stakeholder input on flexibility, and accountability. Possible configurations for infrastructure ownership, regulatory oversight, and operational management balance immediate functionality with long-term adaptability. Stakeholder feedback and international models have informed these options.

Table 9: Alternative Ownership, Operations and Oversight Models

Ownership Model	Likely Operating Structure	Likely Regulatory Oversight	Implementation Considerations
Model 1: **Industry-Led Consortium**	Owned and operated by a consortium of industry participants. A structured operating agreement would need to be established to define roles and responsibilities in relation to the Exchange, with significant emphasis on member cooperation and shared decision-making.	Likely to require a highly prescriptive oversight model with limited operator discretion. Likely governed by a regulator such as the AER under a framework that specifies performance requirements, decision-making processes, and the scope of operational changes. Prescriptive guidance may be required to determine efficient operating costs, pricing, and compliance with regulatory requirements.	• High level of regulatory prescription to prevent conflicts of interest and ensure consistent operation. • Strong governance framework needed to ensure fairness, including an independent advisory body. • Risk of over-complexity due to diverse participant needs. • Strict compliance and reporting requirements would be necessary to manage operational transparency and prevent bias.

Ownership Model	Likely Operating Structure	Likely Regulatory Oversight	Implementation Considerations
Model 2: **AEMO-led Option**	AEMO would assume ownership and operational responsibility for the CER Data Exchange. The CER Data Exchange would be an extension of existing and under development capability within AEMO including the Industry Data Exchange (IDX) initiative (see Appendix A2.1).	Moderate level of prescription, overseen by existing bodies like AEMC and AER, aligning with current AEMO governance mechanisms. Moderate regulatory prescription required to provide transparency and cost-efficiency while ensuring alignment with broader energy market objectives. Operational discretion under a principle-based approach would likely be provided under existing instrument such as the NER and NERR to allow adaptive decision-making. Option for stakeholder involvement and closed consultation regarding CER use cases.	• Operational efficiency and cost benefits would be possible by leveraging existing AEMO systems and expertise. • Benefits from AEMO's existing regulatory compliance processes, offering a more streamlined approach. • Industry participation in oversight may be needed to manage potential conflicts if CER use cases diverge from AEMO's core activities. • Cost recovery must ensure that investments made by AEMO are transparent and beneficial to the market.
Model 3: **New Independent Government Agency**	A newly established government agency would independently own and operate the CER Data Exchange, focused solely on CER data services.	The agency would have autonomy in determining operational needs and resource allocation. High discretion with principle-based oversight, enabling the agency to self-govern under a high-level regulatory or policy instrument. Less prescriptive regulatory requirements compared to other models, emphasising independence and aligning with public interest objectives.	• High cost and extended lead time for setup of CER Data Exchange and Government Agency, including legislative support. • Establishing a self-governing body provides high autonomy but requires a well-defined mandate to ensure focus on CER outcomes. • Effective collaboration with AEMO and existing market participants would be necessary to avoid overlap. • Greater flexibility in adapting to emerging technologies and evolving market needs.

Consultation Questions

8. **Ownership Preferences:** Which ownership model do you believe is best suited for the CER Data Exchange: Industry-led consortium, AEMO-led, or a New Independent Government Agency? Do you have feedback on the models in addition to those summarised in this paper? Are there other ownership models not listed in this paper that you would like us to consider?
9. **Oversight – prescription vs discretion:** What level of oversight should apply to the CER Data Exchange? Should its operation be heavily prescribed, or should it be provided with operational discretion?
10. **Oversight body:** Who should be responsible for overseeing the CER Data Exchange's operation? Are there other models of oversight that you would like considered? How important is regulatory independence in overseeing the CER Data Exchange, and would a new dedicated oversight agency or body better support transparent, impartial governance?

7 Data Governance

The CER Data Exchange will need to deliver benefits of standardisation and streamlined data sharing capability as the energy market evolves with the increasing integration of CER. As CER installation scales, there is a growing need for a robust, coordinated data governance framework to ensure the secure, efficient, and consistent management of CER data. As a CER Data Exchange does not yet exist, no corresponding framework exists to oversee standardised data flows, use cases, or system to system parameters related to CER. Without a coordinated approach, there is a risk of inconsistent data practices, and inefficiencies in integrating CER into the broader energy grid.

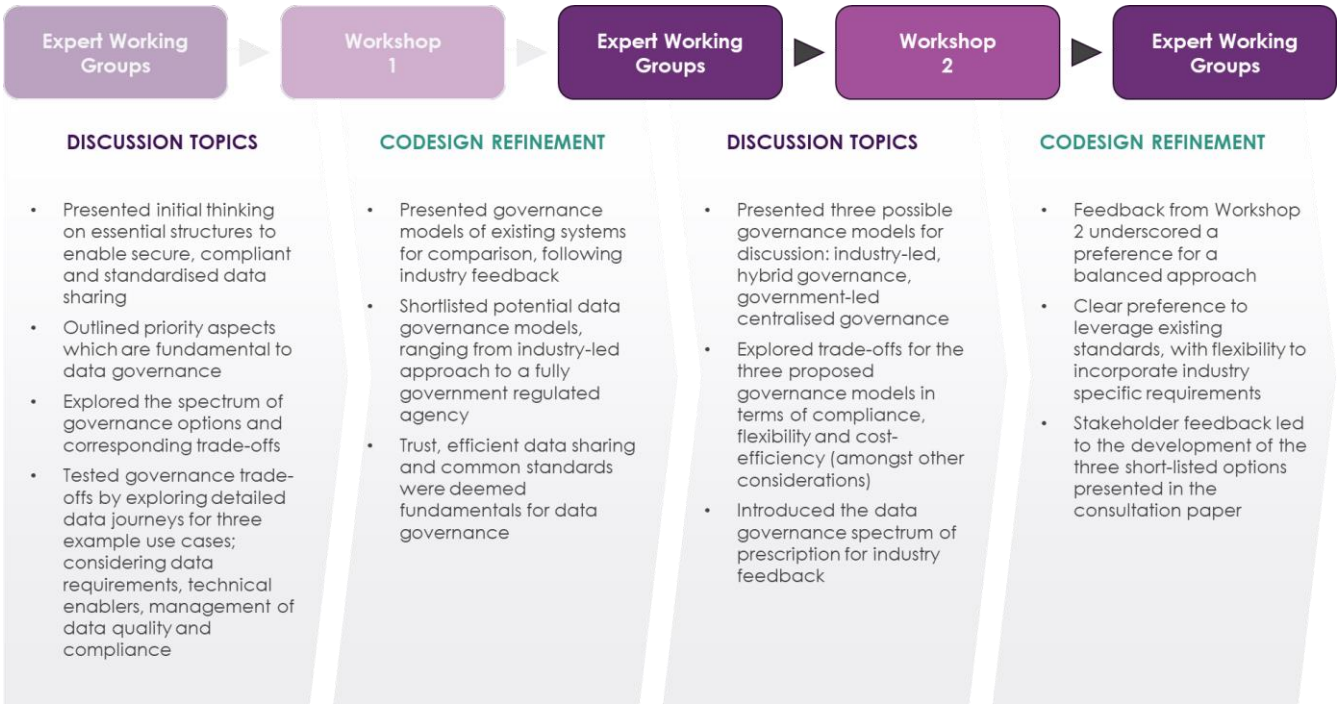
Within the context of a data governance framework for the CER Data Exchange, a governance body could play a crucial role in ensuring data security and reliability, proactively consulting on new use cases, setting parameters for future developments, and ensuring that the Exchange ecosystem adheres to best practices in data management.

Having a body or (multiple bodies depending on the use case) responsible for this process could help ensure the value and trust in the Exchange among both consumers and industry participants.

7.1 Co-design refinement summary

Through the consultation process, some stakeholders argued that beyond the development of physical data sharing infrastructure that enables the efficient sharing of data, a data governance framework is needed to provide a structured approach on data management to compliment the CER Data Exchange. Figure 22 provides an overview of the co-design inputs and refinement outcomes from the co-design process thus far.

Figure 22: Co-design Refinement Stages



7.2 Stakeholder Sentiment

Stakeholder sentiment around the data governance framework reflected the importance of both consistency in compliance and adaptability to emerging technologies. Feedback from Workshop 2 underscored a preference for a balanced approach to governance—one that provides rigorous oversight without stifling innovation.

Elements of data governance

A data governance framework establishes the structures needed for secure, compliant, and standardised data sharing among diverse stakeholders. It differs and should not be confused with technical standards compliance, which is focused on device requirements and communications (e.g. AS4777.2, AS4755, OCPP, and CSIP-Aus). While technical standards govern how devices operate and communicate, data governance in the context of a CER Data Exchange ensures that the information generated by these devices and data produced is shared consistently, securely, and is compliant.

Role of Standards

While industry standards, such as those from IEC and ISO, are foundational for interoperability and quality, they alone are insufficient to facilitate a fully integrated CER data-sharing environment. Standards provide a common language for data, ensuring that different stakeholders can technically communicate, but they do not solve challenges like access control, dynamic data sharing, or real-time collaboration.

As an example from the health sector, HL7 (Health Level Seven) serves as the communication standard, defining the format and structure for exchanging health information among different systems. Whereas My Health Record is data sharing infrastructure which is owned and operated by Australian Digital Health Agency (ADHA) and the

Office of the Australian Information Commissioner (OAIC), ensures data governance with national health data standards.

A common data-sharing infrastructure like the CER Data Exchange goes beyond technical standards by offering the capability and tools necessary for efficient and secure exchange of data between industry participants.

Sharing data between organisations

As discussed above, the CER Data Exchange is not the only way for organisations to exchange data. The type of data that is, or can be exchanged through the CER Data Exchange, is naturally influenced by the Exchange's capability and supported by the Data Governance frameworks. Further, capabilities of the Exchange will grow over time as additional use cases are added. The requirements for each use case will determine if more functionality needs to be added, which in turn determines if the Exchange is the preferred manner to exchange the data.

There are several ways where new data sharing requirements can be the established:

- **Regulatory or legal requirement:** Market bodies such as the AEMC and governments may impose mandatory data sharing requirements on market participants or with other organisations. This requirement may be expressed in rules and regulations such as the NER or NERR, or other instruments such as licence conditions. Generally, the decision to impose regulatory and/or legal obligations on organisations occurs after a consultation process.
- **Agreement between industry groups:** Beyond legal and regulatory requirements, groups of participants (facilitated through role-based access and authentication protocols) may decide that there is a need to exchange data between them to support the provision of services to their customers. For example, DNSPs & retailers may agree to provide each other visibility on certain CER asset operational information.
- **Agreement between two parties:** Two organisations may also agree to exchange information with each other. The agreement could be bespoke to their own needs, independent of industry-wide regulations or build upon existing standards. Such agreements allow for speed, experimentation and flexibility, enabling organisations to address their unique operational needs while aligning with broader industry practices where necessary.

Establishing the data sharing parameters

When determining the need for data exchange between parties, it is essential to define clear parameters for the data to be shared. These parameters ensure that data is transmitted in a structured, secure, and efficient manner, whether it is mandated by regulation or agreed upon voluntarily. Key parameters to be established include:

- **Data Type and Structure**: Defining the format and standards for how the data will be structured to ensure compatibility across systems.
- **Frequency of Transmission**: Agreeing on how often data will be transmitted, whether as timely streams or in less frequent batch processes.
- **Message Validation**: Deciding whether validation checks are needed to ensure data message integrity, such as ensuring mandatory numerical fields are complete and correctly formatted.

- **Security and Access**: Defining which parties are authorised to access and handle the shared data, ensuring appropriate role-based access controls.

For bilateral data sharing arrangements, the above parameters could be negotiated between the two parties exchanging data. In cases of broader industry-wide or regulatory data sharing, an industry working group is generally required to establish these parameters.

Data quality and compliance

Data quality has been raised by the majority of stakeholders as is a critical factor in all use cases, going beyond basic message validation to ensure data's reliability and usefulness. While the CER Data Exchange could play a role in validating data for format and transmission errors, it is not intended to be responsible for ensuring the accuracy of the data's content or enforcing broader data quality compliance. This role would remain with the data's owner, with the data stored in their system as the single source of truth. Stakeholder feedback has clearly highlighted the importance of data quality; however, the Exchange's responsibility should remain focused on technical validation and data exchange, leaving the business context validations and quality assurance to the data owners themselves, supported through a data governance framework.

Assessing the data quality within a message sent through the Exchange is not considered in the options provided in this paper. Quality data is however broadly recognised by stakeholders as a necessary part of a useful data exchange ecosystem. To bolster this project's high-level design and recommendations, stakeholders are welcome to provide thoughts, consideration and ideas for ensuring data quality.

7.3 Shortlisted Options – Data Governance

Establishing a robust data governance framework for the CER Data Exchange is crucial to fostering trust, ensuring compliance, and supporting data sharing across diverse stakeholders. The governance model must enable collaborative decision-making, enforce standards, and adapt to evolving use cases while promoting transparency in data management. The following models (Table 10) outline four potential approaches for data governance on the CER Data Exchange, each varying in structure, compliance mechanisms, and authority, offering distinct benefits and challenges.

These models range from an operator-led approach to a fully independent regulatory body, reflecting different degrees of centralisation, industry involvement, and regulatory oversight. Each model presents unique trade-offs related to compliance, flexibility, cost-efficiency, and scalability. Stakeholder feedback on these models is essential to refining a data governance framework that supports effective data sharing, promotes common standards, and aligns with industry needs.

Table 10: Data Governance Models

Governance Models	Description	Trade-Offs	Implementation Considerations
Model A: Exchange Operator as Authority	The CER Data Exchange operator also acts as the 'Data Governance Authority', managing all aspects of governance, compliance, and data standards. It develops new use cases in consultation with industry, sets parameters, and enforces compliance, leveraging its existing operational role.	**Benefits**: Centralised control ensures alignment between operations and governance, allowing for quick adaptation to new use cases. This model reduces redundancy and simplifies decision-making. **Challenges**: Potential conflicts of interest may arise if the operator prioritises simplified Exchange operations over industry preferences, risking diminished stakeholder outcomes and trust of impartiality.	- Ensures tight integration of governance and operations but requires strong checks to maintain impartiality. - The operator must balance its regulatory role with its operational mandate to avoid bias. - Suitable for rapid implementation but may limit stakeholder trust if not effectively managed. - Adequate industry participation in data governance oversight has been raised as a necessity.
Model B: Industry Collaborative or Association	An industry collaborative or association is appointed as the 'Data Governance Authority'. It collaborates with stakeholders to develop standards, use cases, and compliance mechanisms.	**Benefits**: Provides strong industry-driven governance, ensuring stakeholder engagement and adaptability to market needs. Facilitates consensus-based decision-making, supporting innovation. **Challenges**: Voluntary compliance may lead to inconsistent stakeholder participation, standards and data quality, reducing trust and reliability. Ongoing existence may be less reliable than a Model using a statutory body.	- Fosters collaboration but may struggle with enforcing compliance across all participants. - Requires ongoing stakeholder engagement to maintain alignment with evolving market needs. - Effective for initial setup but may require additional oversight mechanisms to ensure consistent data quality and adherence to standards. - Strict compliance and reporting requirements would be necessary to manage operational transparency, prevent bias and manage conflicts of interest.
Model C: Existing Market Body or Regulator	An existing market body, such as AEMO, AER, or the Clean Energy Regulator, is appointed as the Data Governance Authority. It oversees	**Benefits**: Leverages established expertise and resources, ensuring strong regulatory compliance and consistent enforcement.	- Requires clear delineation of roles to prevent overlap with existing regulatory functions.

Governance Models	Description	Trade-Offs	Implementation Considerations
	compliance, enforces data sharing standards, and facilitates integration with broader regulatory frameworks.	Builds public trust by using a recognised body. **Challenges**: May slow down decision-making and limit flexibility due to obligation to follow existing processes, impacting innovation.	- May face delays in adapting to rapid technological changes due to broader regulatory mandates. - Implementation may be faster than new agency setup but still requires coordination to manage evolving standards. - Strict compliance and reporting requirements would be necessary to manage operational transparency and prevent bias.
Model D: New CER Data Governance Authority	A new, independent government agency is established to manage data governance for the CER Data Exchange. It has full authority to develop use cases, set minimum data sharing parameters, and enforce compliance, operating autonomously from existing market bodies.	**Benefits**: Ensures complete neutrality, focusing solely on CER data governance. Promotes public trust by prioritising consumer interests and regulatory integrity. **Challenges**: Potentially lengthy and complex to establish. May struggle with flexibility and quick adaptation to new use cases. Ongoing existence may be subject to political risk.	- Requires significant investment and a phased implementation approach to manage costs. - Promotes impartiality and transparency, but risks stifling innovation if overly rigid. - Needs clear mandates and legal authority to ensure effective enforcement and stakeholder alignment.

The data sharing governance models outlined above present different approaches to achieving transparency, compliance, and efficiency for the CER Data Exchange. Each model reflects a balance between flexibility, stakeholder participation, and regulatory rigor, allowing the CER Data Exchange to adapt to evolving industry needs while safeguarding data quality and accountability. Establishing a clear governance framework is not only foundational for the success of the CER Data Exchange but also critical in ensuring stakeholder trust and confidence. The feedback provided by stakeholders on these models will be instrumental in refining the final structure and ensuring that the governance approach aligns with industry expectations and practical needs.

Consultation Questions

11. **Data Governance Preference:** Which data governance model best aligns with industry's desire for trust, compliance, and flexibility?
12. **Adaptability:** In your view, how should the data governance model support the integration of new use cases as CER technologies and industry demands evolve?
13. **Stakeholder Engagement:** How frequently and in what format should the data governance framework engage stakeholders on changes to standards, compliance requirements, or new use cases?
14. **Data Quality:** Whilst not included in the scope of the CER Data Exchange, do you have feedback or key considerations for ensuring data quality in a manner which compliments the Exchange?
15. **Alternative Preferences:** Are there any data governance models not listed in this paper that you would like us to consider?

8 Implementation Considerations

This chapter outlines key implementation considerations for the CER Data Exchange, focusing on the transition from co-design to execution. With industry input, the goal is to establish an actionable implementation roadmap, addressing technical, operational, and financial impacts. This project will activity build on prior co-design insights, engaging stakeholders in detailed discussions on cost recovery, compliance models, and reforms required to support the Exchange.

The implementation approach will balance a phased deployment for priority use cases with adaptability for future scaling. Achieving this balance will involve coordinating technical requirements, operational integration, and a sustainable funding model – ensuring both immediate functionality and long-term viability. Stakeholders' insights will be essential in identifying practical solutions for navigating these challenges, contributing to a robust Exchange that aligns with industry needs and national policy goals.

Feedback in this section will directly inform the final stages of this co-design process, including future consultations on the technical specifications, policy alignment, and operational frameworks needed to support an efficient and secure CER Data Exchange. The implementation phase for this project will commence in the Quarter 1 of 2025, which will be influenced by Workshop three, the High Level Design report and the Outcomes report.

8.1 Implementation Roadmap Overview

The implementation of the CER Data Exchange will likely follow a phased roadmap designed to enable both foundational and advanced functionalities – similar to the UK's Digital Spine approach, which has gradually introduced capabilities and expanded user participation over time. A phased rollout will allow for testing, refinement, and stakeholder feedback – enabling flexibility and minimising potential disruptions. The roadmap will target priority use cases initially, with scalability to support additional functionalities in later stages.

Key Phases of the CER Data Exchange Implementation

- **Foundational Phase – Setup of Core Infrastructure and Priority Use Cases**: This phase will establish the basic data-sharing infrastructure, focusing on core technical requirements such as information security, format standardisation, and access management. The primary objective is to operationalise high-priority use cases quickly, establishing a trusted exchange infrastructure while allowing flexibility for expansion. Initial deployment will include stakeholder engagement and pilot testing with select industry participants to gather insights and address any early-stage issues.
- **Expansion Phase – Enhanced Functionality and Broader Integration:** Once foundational capabilities are in place, the next phase will expand the Exchange's functionality to support additional use cases, interoperability with other platforms, and enhanced data validation tools. The CER Data Exchange will broaden its operational model to include new data sources, enabling wider accessibility and encouraging innovation. Emphasis will be placed on building integration pathways with existing infrastructure and optimising exchange efficiency and security.
- **Optimisation and Scaling Phase - Future-Proofing and Full Industry Rollout:** The final phase will focus on optimising processes, integrating evolving standards, and ensuring scalability to handle

increased data flows. Stakeholder feedback on initial phases will shape the Exchange's final structure, and ongoing adjustments will focus on refining compliance frameworks, enhancing user experience, and aligning with global standards. This phase will also address any remaining technical and operational gaps, providing a robust, future-ready platform.

8.2 Policy, Regulatory, and Legal Reform Considerations

Implementing the CER Data Exchange will necessitate extensive policy, regulatory, and legal reforms to create a secure and standardised data-sharing environment. The success of the Exchange relies on aligning new functionalities with existing frameworks while ensuring compliance, interoperability, and security.

It is recognised that a governance framework for the CER Data Exchange must be established early to provide stakeholders with the confidence needed to engage effectively. Establishing the regulatory model and data governance framework before implementing use cases ensures that there is clarity on roles, responsibilities, and compliance standards from the outset.

Early establishment of these frameworks will be crucial for setting up a stable foundation that stakeholders can trust, mitigating concerns regarding transparency, data integrity, liability and regulatory compliance. It also enables efficient stakeholder onboarding and integration, as all parties will be aware of the standards and requirements they need to meet prior to the Exchange's operational launch.

It is expected that the governance framework would ideally be defined and communicated during or prior to the foundational infrastructure phase, with oversight mechanisms ready to monitor the deployment of the initial use cases. This ensures that compliance and governance are embedded in the Exchange's core functionalities, aligning with the phased rollout and expanding capabilities of the data exchange.

8.2.1 Data Privacy and Security Regulations

Reforming existing data privacy and security regulations is vital to ensure that the CER Data Exchange adheres to stringent protections, given the sensitive nature of energy data. Regulatory updates must clarify data ownership, access protocols, and security standards to ensure transparency. Given the importance of customer trust, these regulations should align with the Australian Privacy Principles (APPs) and *Privacy Act 1988*, establishing clear frameworks for consumer consent and privacy protections, especially as more consumer-owned CER become integrated into the national system. Importantly, these reforms must also align with the Consumer Data Right (CDR), ensuring that energy consumers retain control and transparency over their data, which aligns with broader national objectives of enhancing consumer agency and data rights.

8.2.2 Regulatory Reform Landscape

Implementing the CER Data Exchange is likely to involve aligning the CER Data Exchange with the broader national and state-based regulatory frameworks. Key areas of focus include ensuring that the new Exchange complies with existing market principles while facilitating integration across various sectors, including emerging technologies, and non-traditional energy market participants. Reforms must also ensure that the CER Data Exchange supports national decarbonisation targets and other energy policy objectives by enabling transparent data flow and efficient grid management.

8.2.3 Technical and Cyber Standards

Technical standardisation is fundamental to the implementation of the CER Data Exchange, ensuring that data is exchanged seamlessly across systems and stakeholders. The adoption of standardised APIs will allow seamless integration between the CER Data Exchange and stakeholders such as retailers, network operators, and CER customer agents, thus promoting efficient operations and scalability.

In parallel, the Exchange must adopt and align with cybersecurity standards and obligations under the Security Of Critical Infrastructure Act 2018 (SOCI) to safeguard against cyber threats, particularly as the Exchange grows and involves a greater number of organisations. This alignment will provide resilience against emerging threats, maintaining the integrity & security of the Exchange, which is paramount for stakeholders to trust and system use.

8.3 Cost Recovering

The cost recovery framework for the CER Data Exchange is a critical aspect of its implementation and long-term sustainability. As the Exchange is designed to serve a broad range of industry stakeholders, the recovery of costs associated with its development, maintenance, and operational enhancements needs to be equitable, transparent, and aligned with the interests of both service providers and end users. Additionally, it will be essential to consider how integration costs for participating entities can be managed or supported to promote wide adoption across the industry.

Although cost recovery will be a key topic in the next phase of this co-design process, this chapter seeks to establish guiding principles and invite stakeholder feedback to shape the next phase.

8.3.1 Cost Recovery Framework

Establishing a clear framework for the cost recovery of implementing and operating the CER Data Exchange is essential to ensure financial sustainability and fair distribution of responsibilities. The framework should set out funding obligations for organisations using the CER Data Exchange to share data. A transparent and equitable cost recovery model will help encourage broader stakeholder participation and commitment, which is key to the Exchange's long-term success. Additionally, public-private funding mechanisms or industry levies could be used to sustain initial and ongoing operations, ensuring stakeholders have aligned incentives to actively participate.

Development and Operational Costs

The foundational costs of building and operating the CER Data Exchange encompass infrastructure setup, regulatory compliance, security protocols, and ongoing data governance. To ensure long-term reliability, these operational costs must also support regular updates and integrations that will allow the Exchange to adapt to new technologies and use cases.

Industry Integration Costs

Participation in the CER Data Exchange will likely require stakeholders to undertake some level of internal development, such as system upgrades, data standardisation, and cybersecurity enhancements. The Exchange’s cost recovery model could consider mechanisms to alleviate these costs or facilitate their integration over time. By

managing integration costs effectively, the CER Data Exchange can encourage higher participation rates and ease the burden on stakeholders, especially smaller market participants.

8.3.2 Potential Cost Recovery Models

Direct Cost Recovery from users

A model where the costs are recovered directly from the stakeholders that use the Exchange could involve an access fee structure, such as subscription fees, usage-based fees, or tiered pricing based on data volume. This approach aligns costs with the extent of usage, creating incentives for participants to manage their data interactions efficiently. However, it may require careful calibration to avoid imposing disproportionate costs on smaller entities.

Shared Cost Model

A shared cost model distributes costs to a cross section of users. A potential model could see a cross-industry level based on industry size or category or reflect the organisation's role in the energy market. This approach can ease financial strain on smaller players by balancing cost-sharing across a larger base but requires clear and transparent criteria to ensure fairness. Additionally, this model may need to incorporate flexibility for participants with lower levels of exchange interaction to promote inclusivity.

Government and Industry Partnerships

Incorporating public funding or grants to offset initial development costs may be an option, especially given the CER Data Exchange's alignment with broader national energy goals. Public funding would lessen the financial burden on stakeholders and accelerate implementation but will introduce unanswered questions regarding the long-term funding models.

Consultation questions

16. **Phased Implementation Roadmap:** Do you agree with the proposed phased approach for the CER Data Exchange implementation? What adjustments or considerations would you suggest to better align the phases with the needs of your organisation?
17. **Cost Recovery Model Preferences:** What are your preferences regarding cost recovery for the CER Data Exchange? Would a direct, shared, or government-supported model be preferred, and why?
18. **Regulatory and Policy Reforms:** Which areas of policy or regulatory reform do you believe are most critical to support the CER Data Exchange? How should these reforms balance compliance with operational flexibility?
19. **Technical and Operational Challenges:** What technical or operational challenges do you foresee in integrating your systems with the CER Data Exchange? Are there specific support mechanisms that would facilitate smoother adoption for your organisation?
20. **Impact on Stakeholders:** What technical, regulatory, operational, or commercial impacts would you anticipate from implementing the CER Data Exchange in your organisation, and how could the roadmap or cost recovery model alleviate these impacts?

Appendices

A1. Complementary Capabilities & Initiatives

The energy industry already is already familiar with the sharing of operational data related to system operation or financial flows within the energy retail market. Throughout our consultation, stakeholders have raised questions about the extent to which the CER Data Exchange would duplicate existing systems and platforms. We have highlighted where there may be some overlap and possible sources of data for the CER Data Exchange and sought to clarify where existing approaches will not be sufficient to manage CER data at the scale required in the future.

Platform or Capability	Description
Utility Systems	
Advanced Distribution Management Systems (ADMS)	Utility-operated systems designed to manage distribution grid operations, including voltage regulation, outage management, and the control of distributed generation. ADMS facilitates DER integration at the local grid level, operating within utility-specific boundaries and often using proprietary communication protocols. However, it is not used for standardised, multi-party data sharing that supports national coordination. The CER Data Exchange could complement ADMS by enabling broader data exchange across utilities, potentially improving cross-network coordination and response.
Utility Demand Response Platforms	Platforms used by DNSPs and retailers to manage demand response, typically focusing on bilateral agreements with consumers or aggregators to shift loads during peak demand. These platforms are generally not interoperable with broader grid management systems and are often confined to limited-service areas. They lack capabilities for multi-party data sharing, creating silos. The CER Data Exchange may provide an infrastructure for multi-party data sharing, allowing utilities to better coordinate demand response across the network, potentially reducing silos and enhancing scalability.
Distributed Energy Resource Management Systems (DERMS)	DERMS support the management of distributed energy resources, including setting export/import limits, issuing instructions, and local optimisation. While DERMS plays a critical role in managing DER locally, it is not designed for broader data sharing across multiple stakeholders or market integration. The CER Data Exchange could enhance DERMS by offering a platform for more standardised

	data sharing, supporting improved coordination with other market participants and enabling more effective DER management.
Aggregator Systems	
Aggregator Platforms and Virtual Power Plant (VPP) Management	Proprietary platforms used by aggregators to manage VPPs, providing insights into DER performance, battery status, and aggregated load. These systems are optimised for local control but lack standardised protocols for wider market integration or communication with utilities. As a result, data shared by these platforms is often siloed. The CER Data Exchange could facilitate standardised, secure data sharing between aggregators, utilities, and market operators, potentially supporting more coordinated VPP management and integration into the broader energy market.
deX Platform	deX acts as an integration layer between distributed energy resources, trading platforms, and distribution management systems, enabling visibility, orchestration, and local optimisation. While effective for facilitating DER management within specific networks, deX's scope is limited to local integrations and lacks national-scale coordination. The CER Data Exchange may complement deX by offering a more national framework for data sharing with a greater number of counterparties, potentially enabling standardised protocols for integration and broader participation in market-based services.
Piclo Flex	Piclo Flex is a marketplace that supports system operators in procuring local flexibility and managing network constraints. It offers functional modules that allow operators to manage flexibility based on their needs and level of process automation. However, Piclo Flex operates primarily at a local network level, with limited mechanisms for broader data integration. The CER Data Exchange may provide the foundational infrastructure for more coordinated flexibility services, enabling integration of Piclo Flex data into wider grid operations and supporting enhanced market participation.
Communication Protocols and Technical Standards	
CSIP-AUS and IEEE 2030.5	CSIP-AUS and IEEE 2030.5 are communication protocols that support secure, interactions between DERs and utility servers. These standards are primarily focused on managing point-to-point communication and do not enable wider data sharing among multiple parties. The CER Data Exchange could extend these standards by facilitating one-to-many data exchanges, potentially supporting broader coordination among DNSPs, aggregators, and market operators for grid management, demand response, and market integration.

OCPP (Open Charge Point Protocol)	OCPP facilitates communication between EV charging infrastructure and charge management systems, ensuring interoperability at the device level. However, it does not integrate EV charging data into wider grid operations or market systems. The CER Data Exchange could support the integration of OCPP data into national energy management systems, enabling broader coordination of EVs, load management, and demand response, which may enhance the role of EVs in grid stability and allow for more effective market participation.
AS/NZS 4777 and IEEE 1547	These technical standards govern the safe interconnection of DER to the grid, focusing primarily on device compliance and safety. While they ensure operational safety, they lack the functionalities needed for broader data-sharing and market integration, limiting the use of DER data for wider market participation. The CER Data Exchange could use data from compliance checks to create actionable, standardised information that may be useful across the NEM, facilitating coordination and more effective integration of DERs into market operations.
Systems of Record	
Consumer Data Right (CDR)	CDR is a regulatory consent framework that allows consumers to provide consent for an accredited third party to access their energy data. It covers data like NMI standing data, billing information, DER Register information and revenue meter readings, primarily focusing on consumer-controlled data sharing. However, it does not facilitate large-scale, multi-party coordination, limiting its impact on broader CER integration. The CER Data Exchange could build on CDR's consent framework as a supporting tool for dynamic, multi-party data exchanges, enabling use cases like aggregated demand response, load management, and trading, while enhancing consumer engagement in energy markets.
Portfolio Management System (PMS) and DER Register	These systems provide reference data on DER installations and VPP portfolios, primarily for compliance purposes. Access to this data is limited to DNSPs and AEMO, making it static and less effective for coordination across multiple stakeholders. The CER Data Exchange may expand access to this data, allowing for dynamic sharing among various participants and supporting more effective operational planning, coordination, and integration of DERs into market operations. It could facilitate updates and improve visibility of DER activities across the grid.
Security and Access	
NEM Identity and Access Management (IDAM)	IDAM is a centralised system for managing user identities, permissions, and access across the NEM, ensuring secure access to market data. While IDAM manages access control effectively, it primarily focuses on existing market systems and may not fully address the additional security needs posed by CER data sharing at scale. The CER Data Exchange could integrate with IDAM,

	supporting role-based access and ensuring that CER data is shared securely and only with authorised parties, maintaining compliance with privacy and data protection standards.
Public Key Infrastructure (PKI)	PKI is a security protocol that ensures secure communications within the NEM, focusing on mutual authentication and encryption, particularly for protocols like CSIP-AUS. While PKI is essential for securing device-level communication, it does not offer broader data governance needed for large-scale CER integration. The CER Data Exchange could use PKI to support secure data transmission, maintain data integrity, and enable encrypted communications among participants, thereby enhancing trust in the system's security.
Market Integrations	
Industry Data Exchange (IDX)	**IDX** is a NEM reform initiative focused on modernising existing data exchange capabilities in the NEM and WEM electricity and gas markets by replacing legacy systems with secure, standardised integration patterns. It aims to streamline data flows between market participants, DNSPs, aggregators, and service providers. While IDX focuses on core market transactions, it has not identified any specific CER data sharing use cases. The CER Data Exchange could leverage IDX's modern infrastructure to support more standardised data sharing for CER-related use cases, enabling seamless CER integration across the market and potentially supporting new use cases. At the request of stakeholders, an IDX fact sheet and FAQ is provided below in Appendix A2.1.
NEM Retail	The **NEM Retail** platform manages customer switching, NMI standing data, and retail competition within the electricity market, serving as the 'source of truth' for market participant at a given site. However, it lacks capabilities for broader data sharing related to CER management. The CER Data Exchange could enhance NEM Retail by allowing for data integration that supports load management, demand response, and other CER-related services. This may improve customer switching processes, enhance coordination among retailers, DNSPs, and aggregators, and facilitate the integration of CERs.
B2B eHub	The **B2B eHub** facilitates data exchange among suppliers, distributors, and retailers, primarily using legacy one-to-many data patterns. It is currently being upgraded under the IDX/IDAM initiative to enhance data-sharing capacity and scalability. While B2B eHub supports core retail transactions, it lacks the dynamic, multi-party coordination needed for CER management. The CER Data Exchange could complement B2B eHub by enabling scalable data-sharing patterns that support wider coordination, interactions, and more effective CER integration across the market.

Policy and Regulatory	
Integrating Price Response Resources (IPRR) Rule Change	The IPRR Rule Change aims to enable flexible resources to participate directly in the market, supporting aggregated demand response and load management. However, existing systems do not fully support the multi-party data exchange needed to operationalise this rule change effectively. The CER Data Exchange could facilitate data sharing between flexible resources and market participants, potentially lowering barriers to entry and making it easier for new participants to engage in demand response and load management.
Unlocking CER Benefits (Flexible Trading Arrangements Rule Change)	This rule change aims to enable more responsive trading arrangements and load flexibility for CERs, improving their market participation. Existing systems may not be fully equipped to handle the dynamic data-sharing requirements necessary for this rule change. The CER Data Exchange could support seamless data sharing for flexible trading arrangements, potentially improving load flexibility, supporting demand response, and enhancing grid reliability through coordinated CER integration. This could help realise the full potential of CERs as active participants in the market.
AEMO Engineering Roadmap	The AEMO Engineering Roadmap outlines technical upgrades to improve CER integration into the grid, covering demand response, grid coordination, and resilience. The CER Data Exchange could align with the roadmap, providing the digital foundation required for enhanced grid coordination, improved demand response, and stability, helping AEMO to achieve its strategic objectives.
National CER Roadmap	The National CER Taskforce/Roadmap aims to create a national strategy for integrating CERs into the electricity system, improving coordination, visibility, and market participation of CERs. However, without a data exchange, these goals may be challenging to achieve. The CER Data Exchange could serve as a core infrastructure for implementing this strategy, enabling standardised, secure, and efficient data sharing across stakeholders, supporting broader decarbonisation and energy transition efforts.

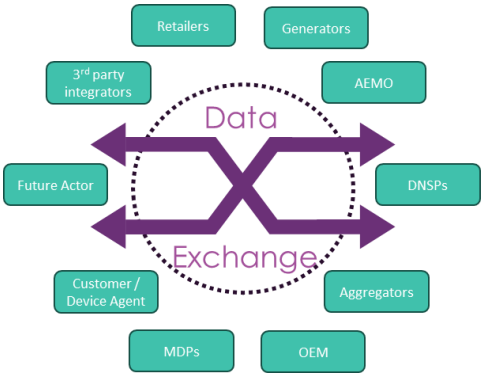
A2. Industry Data Exchange

A2.1 IDX Fact Sheet

Through the CER Data Exchange co-design process, stakeholders requested additional information about the AEMO Industry Data Exchange (IDX) project[11]. This fact sheet contains general information as well as responses to frequently asked questions.

What is the Industry Data Exchange?

The IDX is an initiative endorsed by the energy sector at the Executive Forum, designed to modernise data sharing across Australia's energy markets. The IDX is a data exchange[12], which provides a capability for organisations to set exchange standards, data schemas, and securely share data, enabling effective and flexible data exchange between organisations. The IDX allows organisations to develop payloads[13] specific to their needs, thus fostering current and future use cases.



IDX Delivers:

1. An energy market data exchange
2. Allowance for new payload types
3. Deployment of new channels
4. Allows for new participant types

The IDX enables:

- **Secure Data Exchange**: Uses industry-leading technology to enable secure data transfer between organisations.
- **Customisable Payloads**: Allows organisations to define payload schemas to fit unique needs without impacting others.
- **Flexible Use Cases**: Users can specify data exchange services that are tailored to their requirements.
- **Scalable Participation:** Supports new energy market participants and third-party organisations, enabling future adaptability. Significantly reduces the impact of connecting new organisations into a data exchange market.
- **Robust and self-healing:** IDX provides flow control which protects organisation in the event another organisation has an issue and allows the recovery for other organisations that have had an outage or other connectivity impacting issue.

[11] AEMO | Market Interface Technology Enhancements

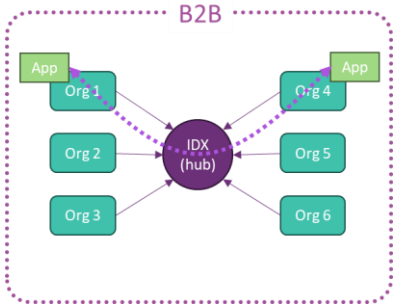
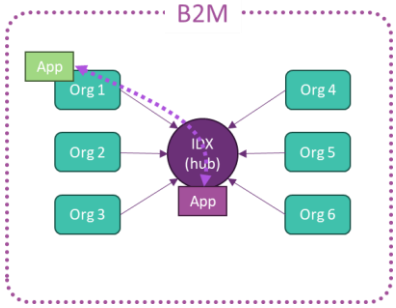
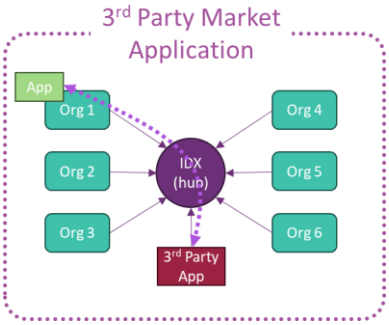
[12] IDX is not a data repository and does not hold standing data as a permanent data store

[13] A payload defines the format of the data and establishes the mandatory, optional and fixed elements of the data representing the service. It is distinct from the elements of the message that relate to the technical transmission of the data.

The IDX has endorsed by industry and approved by AEMO in mid-2024, and the foundational capability is presently being designed and built[14]. Ongoing consultation is conducted through the Market Interface Technology Enhancements (MITE) Working Group[15].

Services provided by IDX

The IDX framework, hosted by AEMO, is designed to allow for organisations to securely and flexibly exchange data with one another when participating in the energy market using scalable infrastructure. IDX can support business-to-business (B2B), business-to-market (B2M), and third-party applications.

 *B2B communication between two hub-connected organisations*	• Organisations host their applications. • Hub hosts endpoints to facilitate and decouple exchange between organisations. • Hub provides capabilities to extent defined by the business service. Can support fixed, hybrid or dynamic payload definition. Can support validation. Can support version on demand, etc. • AEMO provides optional gateway software to organisations that supports all IDX security, exchange patterns and channels
 *Organisations communicating via the hub, where the hub hosts the application service*	• AEMO hosts the application (developed by AEMO), which is integrated into the hub. • Organisations host their own applications which support the interaction with the hub hosted application. • Hub hosts end points to facilitate exchange. • Hub provides full stack capability to support the exchange (validation, etc). • AEMO provides optional gateway software to organisations that supports all IDX security, exchange patterns and channels
 *Organisations communicating via the hub, where the hub hosts a 3rd party developed application service*	• AEMO could integrate a 3rd party hosted market application (developed by a 3rd party). • Organisations host their own applications which support the interaction with the hub hosted application. • Hub hosts end points to facilitate exchange. • Hub provides capabilities to extent defined by the 3rd party application. • AEMO provides optional gateway software to organisations that supports all IDX security, exchange patterns and channels

[14] Whilst the IDX foundation is being designed and built, the decision to migrate existing (legacy) business services to the new patterns was postponed until late 2025 or early 2026. If that decision is endorsed, then all industry participants will need to implement the new patterns to support their existing business services.

[15] More information available at: https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/market-interface-technology-enhancements

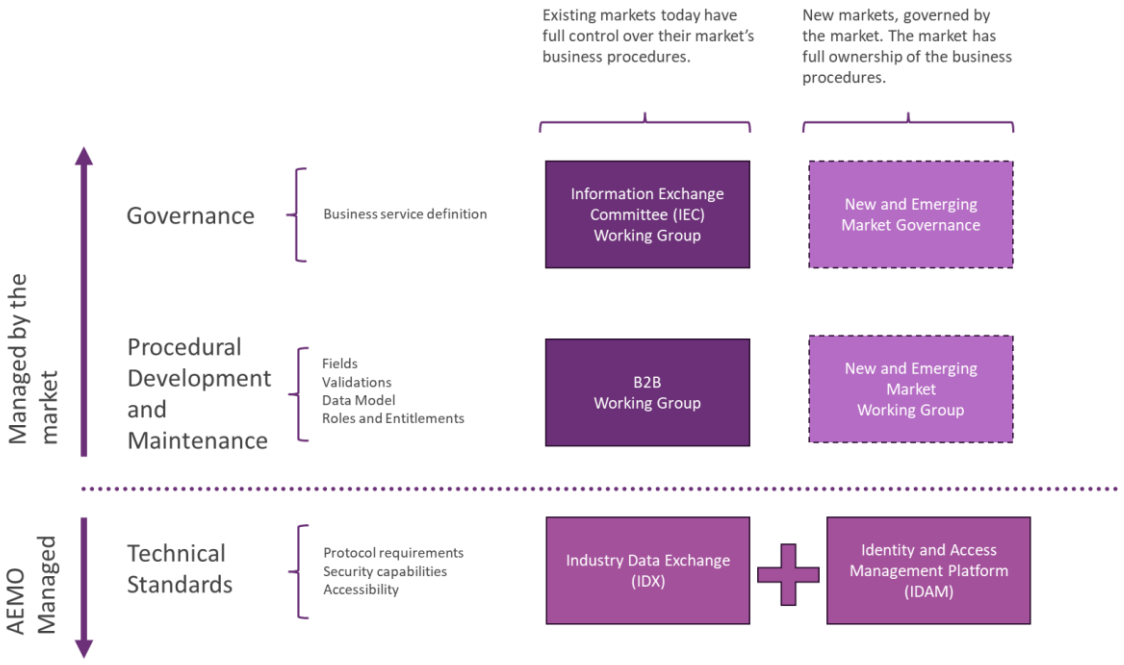
Allowance for new payload types

The IDX framework allows for procedurally defined schemas with associated validations as well as bilaterally agreed payloads to be passed through (for example; payload types agreed between energy market organisations). Some examples include:

Scenario		Payload Governance
Fixed payload definition	What the market manages	Payload structure is governed by a separate market -wide body, agreed by that market (e.g. IEC).
	What AEMO manages	AEMO implements the payload schema defined by the market and ensures it is validated on IDX.
Dynamic payload definition	What the market manages	Basic payload structure is governed by the market, however the specific body of the payload is defined bilaterally between organisations in the market.
	What AEMO manages	AEMO implements the basic payload schema defined by the market, ensures it is validated on IDX, and ignores structure of the specific body of the payload.
Hybrid payload definition	What the market manages	As with the dynamic payload, however parts of the specific body may be fixed.
	What AEMO manages	As per the Dynamic payload definition, however the schema implemented and validated on IDX would extend into specific parts of the body as defined by the market.

Deployment of new business services

The IDX platform will allow new services to market, based on modern integration practices. This allows for the future expansion of services as opportunities present. For the development of new services, AEMO will not be the only entity responsible for the oversight of IDX. AEMO will host and manage the technical standards for IDX, the governance of the business services (i.e. business service definition, the business rules, payload structure, etc) is via the responsible parties of those services.



Allowance for new organisation types

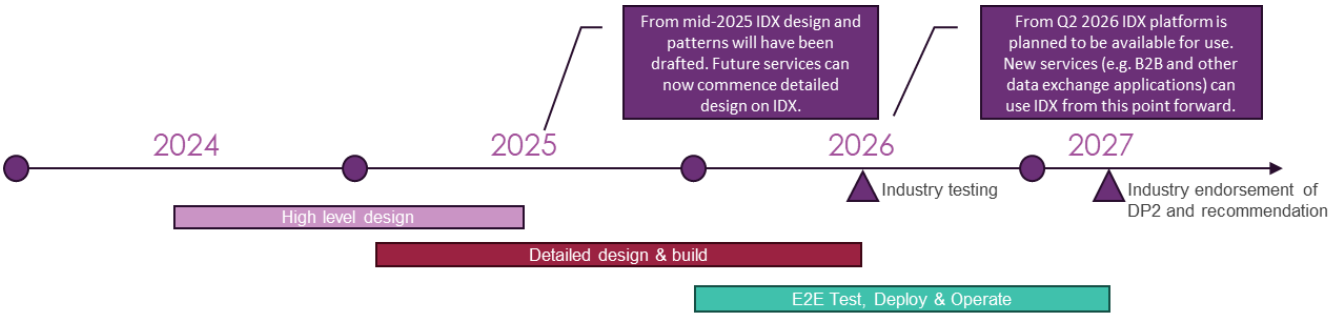
IDX will ensure existing and new organisation types (or new organisations entering into the energy market)[16] are able to participate and exchange data with one another in a secure way.

Timeline

The implementation plan for IDX is:

- **Platform Design Completion**: By mid-2025, the IDX platform and data-sharing patterns will have been drafted, with detailed design activities commencing thereafter.
- **Operational Launch**: The IDX platform is planned to be ready by Q2 2026, allowing for the development and deployment of CER services.

Testing activities will begin ahead of the first production dates. The figure below outlines the delivery schedule for IDX and when new services can confidently design for IDX, and when IDX will be available in production to enable the hosting of new services.



Frequently Asked Questions

AEMO has developed answers to questions that were raised at the CER Data Exchange co-design process. We have combined questions where appropriate to provide more succinct answers.

Is there opportunity to influence IDX?

A: Yes. Stakeholders are encouraged to continue collaborating with the IDX project team to shape the development.

Will participants be able to customise data exchange processes on IDX?

Yes, IDX allows for flexibility in customising payload structures. Participants can define payloads that meet their unique needs without requiring industry-wide consensus. This ensures the IDX is adaptable to different organisational requirements while maintaining overall compatibility.

How will legacy systems be integrated into IDX?

Whilst new services are due to go live once the IDX platform is in production, IDX allows legacy business services to migrate once the foundational platform is operational. This migration will be assessed in early 2026. Until then, the existing systems will continue to operate.

Will we need to wait for the foundational elements to be completed?

[16] IDX has been built for the energy market. New organisations are part of the energy market.

Procedural definition can commence with the development of the IDX Technical specification, build activities can commence in line with the Technical specification and Procedural definition in parallel to AEMO's development of the IDX foundational capability. The IDX Plan on a Page above provides timelines of when testing and pilot activities could operate ahead of the first production dates. We believe this aligns with CER use-case needs, and we would recommend parties looking to build on top of IDX engage closely with the IDX project during design and build.

How does IDX manage security and access authentication?

The platform, in conjunction with the Identity and Access Management (IDAM), has been explicitly developed to meet the security needs of energy markets, including responding to new and emerging threats.

Is IDX inflexible and limiting for innovation?

No. The IDX principles promote flexibility through a dynamic payload structure, allowing participants to create tailored use cases without needing full industry or AEMO approval.

Is AEMO the only entity responsible for IDX oversight?

No. While AEMO hosts and manages the technical standards for IDX, the governance of the business services (i.e. business service definition, the business rules, payload structure, etc) is via the responsible parties of those services.

Can IDX accommodate non-traditional market participants like DER aggregators and third parties?

Yes. IDX is designed to enable a diverse range of participants, including new market entrants, ensuring equitable access to energy data exchange capabilities.

Does IDX cater for the CER Use Cases?

Yes, IDX is designed as a data exchange for all organisations and services in the energy market. We have assessed the CER use cases developed through the CER data exchange co-design process and our view is that all use-cases can be met by the IDX patterns.

Is there still opportunity to influence the process or is it locked?

We are open for feedback and would encourage the CER Data Exchange co-design participants to collaborate ongoing with the IDX project team.

Will IDX be Inflexible, innovation stifling?

No, the guiding principles of IDX ensures an open and flexible data exchange platform. For example, the dynamic payload structure enables bilateral or multilateral definition by participants without requiring all of industry (or AEMO) agreement.

Will IDX represent Industry needs? E.g. the design of market mechanisms and digital infrastructure is to be neutral to all receivers

Yes, the IDX platform is intended to meet the needs of new and emerging participants as well as existing. The IDX material was developed through a transparent and collaborative design and business case exercise with industry. The material for all of this content is available on the AEMO IDX webpage. Further detailed design work is being developed through an industry forum (the MITE working group) to which all industry participants are welcome to join, and specialised focus groups, to which we would welcome nominations. The design of patterns and infrastructure is explicitly designed to have low barriers to entry for new participants, whilst maintaining security and extensibility. We have cross-industry participation in the working groups and focus groups at the moment, and we would welcome new CER participants to join.

Does IDX consider Data security and management?
Yes, security is a key priority for IDX (e.g. highly secured AuthN and AuthZ)

What is the IDX governance structure? E.g. AEMO May not be best placed to represent DNSP and Customer needs (combat with industry representatives in design and governance)
IDX is governed by the MITE Working Group, which is represented by many of the same organizations on the CER Data Exchange program.

Will leveraging IDX decrease external costs?

Yes, reducing external cost is a primary driver for the IDX platform;

- Design, build, integration costs Infrastructure costs (e.g. MarketNet)
- Maintainability / support costs – noting that the IDX patterns are standardised and so form a small set of patterns that apply to all possible patterns

Can the CER Use Cases run on a different timeline than the foundational piece (picking up that it could follow the MSR Project)?
Yes, that is a possibility.

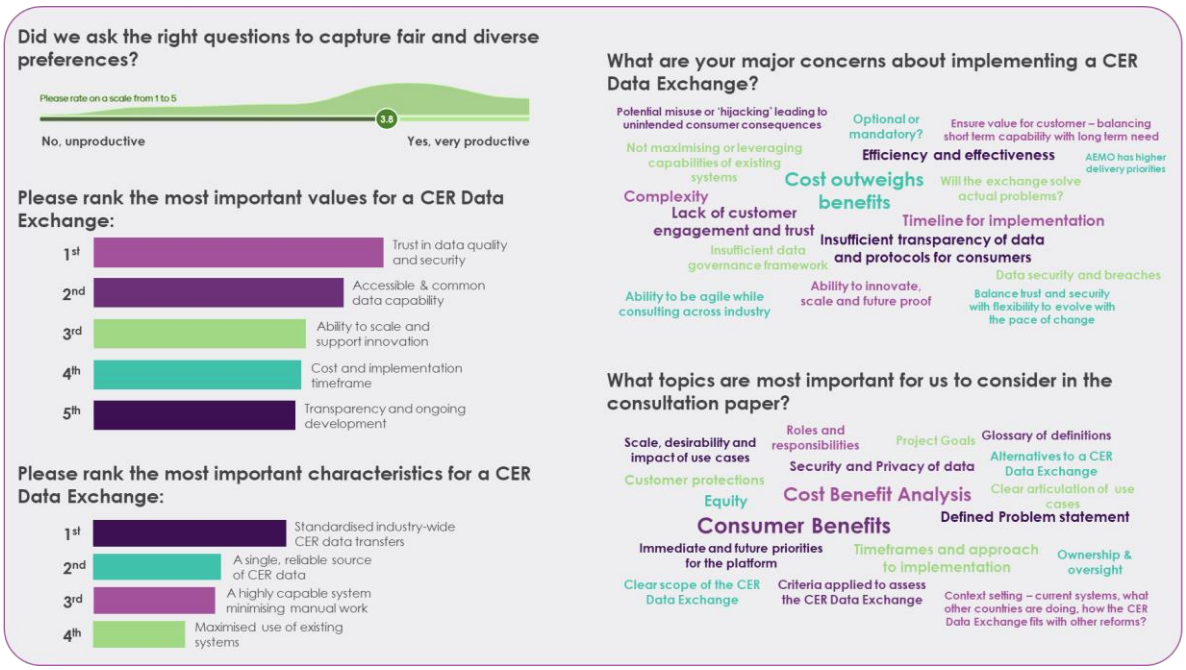
A3. Workshop Survey Findings

A3.1 Workshop 1 Survey Results

These results underscore the critical role stakeholders see CER data playing in achieving Australia's energy transition goals, while also highlighting the major challenges around standardisation, cost, and data security that need to be addressed.

- **Importance of CER Data Sharing**: A vast majority (79% "Strongly Agree" and 29% "Agree") believe that access to and efficient sharing of CER data is a critical enabler to achieving the National Electricity Objective (NEO) and reaching Net Zero goals.
- **Coordination of CER at Scale**: Stakeholders overwhelmingly support (81% "Strongly Agree" and 29% "Agree") the need for CER coordination at scale, with customer consent, as crucial for enabling a more efficient and cost-effective power system for all consumers.
- **Current State of CER Data Sharing Maturity**: Stakeholders rate the current maturity of CER data sharing in Australia as underdeveloped, with 32% describing it as "Immature" and another 32% classifying it at the "Pilot/Trial" level. Only 23% see it as having "Ad hoc Maturity," while none consider it "Mature."
- **CER Data Sharing Challenges:** The top challenges to address are "Standards & Interoperability" (ranked 1st), followed by "Cost & Complexity" and "Security & Privacy." Lesser concerns include "Access & Authentication" and "Accuracy, Timeliness & Reliability."
- **Domains Benefiting from Improved CER Data Exchange**: The energy system domain expected to gain the most value from improved CER data exchange is "System Operation & Planning" (ranked 1st), followed by "Market Efficiency & Performance," "Customer Choice & Agency," and finally "Research & Innovation."

A3.2 Workshop 2 Survey Results



The survey results in this image highlight key stakeholder perspectives regarding the development and implementation of the CER Data Exchange:

- **Stakeholder Engagement**: On a scale of 1 to 5, respondents rated the questions posed in the consultation process as moderately productive, with an average score of 3.8, suggesting that most stakeholders felt the process captured fair and diverse preferences.
- **Most Important Values for a CER Data Exchange**: The top-ranked value is trust in data quality and security, followed by the need for accessible and common data capability. Stakeholders also emphasised the importance of the platform's ability to scale and support innovation, with secondary considerations being the cost and implementation timeframe, and the need for transparency and ongoing development.
- **Key Characteristics for a CER Data Exchange**: Stakeholders prioritised standardised, industry-wide CER data transfers as the most important characteristic, followed by the need for a single, reliable source of CER data and a highly capable system that minimises manual work. Maximising the use of existing systems was also seen as important.
- **Concerns About Implementation**: The top concerns raised by stakeholders include whether cost outweighs benefits, the complexity of the platform, lack of customer engagement and trust, and insufficient data governance frameworks. Additional concerns centred around the timeline for implementation, ensuring security and privacy for consumers, and the ability to scale and future-proof the platform.
- **Key Consultation Topics:** The most important topics for further discussion were consumer benefits, cost-benefit analysis, and security and privacy of data. Stakeholders also emphasised the need to clarify the scope of the CER Data Exchange, address issues of equity and consumer protections, and provide clear timeframes for implementation and the impact of use cases.

A4. Use Case Details

Parent Use Case – Sharing Network Limits

Overview	Distribution network assigned dynamic limits across NEM jurisdictions may be shared via a common integration point. This capability will enable improved and informed decisions by customer agents on available network capacity, to co-optimise, access the network, and act in line with grid limits. Using an email analogy, current and planned DNSP capability to send flexible network limits or backstop instructions to customer devices represent a 1:1 'To' field while the CER Data Exchange will efficiently add a complementary 'CC' field to extend visibility of dynamic limits to other parties without compromising the primary control loop.	
Problem Statement or Need	Current systems and arrangements for sharing network limits, such as Dynamic Operating Envelopes (DOEs) or Flexible Export Limits (FELs) and those implemented for emergency backstop, are designed for one recipient per limit. Although a standard is being progressed to aid the 2030.5 utility servers being implemented, there is still a lack of consistency in the implementation of DOEs/FELs and data standardisation across DNSPs. At scale, this will lead to inefficiencies, potential misalignments, and additional costs for consumers versus a more standardised approach.	
Data Journey	1. Limits are calculated in separate Network organisation systems and then securely sent to the Exchange without compromising the primary control loop. 2. Relevant authorised organisations could subscribe to receive different kinds of limits. 3. The Exchange could partition the network limits to the right organisations based on their registered portfolio. 4. Historical aggregate network limits could be maintained by relevant data domain owners, with access provisioned to authorised stakeholders for analysis, auditing, and reporting. 5. Reviewing and reporting on individual conformance with limits can also be facilitated in this way.	
Actors	**Data Producers** • DNSP; TNSP	**Data Users** • Retailer; aggregator; OEMs (including EVSE providers and operators); DNSP; TNSP; AEMO; Regulatory and Government bodies; Research
Target Outcome or Benefit	• Reduces integration costs by providing a standardised interface and standardised data definitions/structures for sharing and accessing network limit data across different regions. • Supports entry by new entrants and innovation of new products and services, by easily accessing critical information. • Provides a flexible foundational for implementing advanced grid management services.	
Implementation Challenges & Risks	• Integration with existing capabilities and sources of data. • Achieving alignment on data definitions and structures across all stakeholders.	

Parent Use Case – Grid Data Collaboration

Overview	Facilitate the sharing of aggregate system operation data between AEMO and network service providers. Potential benefits include improved operational awareness, and support for grid performance optimisation.	
Problem Statement or Need	There current ecosystem lacks a unified, efficient method for sharing a variety of non-SCADA data to support system operator collaboration (DNSP, TNSP and AEMO). This gap hinders effective collaboration and limits the ability of system operators to efficiently operate the grid with very high CER penetration.	
Data Journey	1. Grid data is created by various organisation systems from different sources off-Exchange and is then securely transmitted to the Exchange. 2. The grid data is categorised and access-controlled based on sensitivity and relevance. The exchange could support sharing data to multiple stakeholders or direct to a single stakeholder. 3. Authorised stakeholders could also receive event-based alerts about conditions or emergencies. 4. Historical logs of data transactions could be stored separately for auditing and reporting purposes.	
Actors	**Data Producers** • DNSP; TNSP; AEMO; Metering service provider; OEM; Weather tech	**Data Users** • DNSP; TNSP; AEMO; Regulatory and Government bodies; Research
Target Outcome or Benefit	• Reduces the integration costs and complexities of sharing operational planning and forecasting. • Creates a flexible foundation for future grid management coordination, needs, and services.	
Implementation Challenges & Risks	• Aligning stakeholders on system integration roles and responsibilities and standards. • Handling potentially large volumes of operational forecasting and planning data.	

Parent Use Case – Scaling Dynamic Network Pricing

Overview	More time-specific and locational pricing signals from DNSPs to customers will encourage customer behaviour to shift more dynamically in response to changing network conditions. Dynamic network prices are similar to DOEs in that they are a data packet that is shared to Customer Agents to inform how CER is operated. Share dynamic network prices in a standardised way, at scale, across multiple DNSP jurisdictions. This option may incentivise greater local network utilisation with higher levels of scalability, consistency, and economies of scale.	
Problem Statement or Need	Current systems and emerging trials lack a unified and efficient method for distributing dynamic network prices to many organisations, which could hinder their effectiveness and scale	
Data Journey	1. DNSPs calculate dynamic prices using an organisational pricing engine separate to the Exchange. 2. DNSPs send one bundle of prices to the Exchange with key metadata attached. 3. The prices could then be partitioned to the right organisation at the right time. 4. Organisations receive dynamic pricing information and adjust operational behaviour.	
Actors	**Data Producers** • DNSP	**Data Users** • Aggregator; OEMs (including EVSE providers and operators); Retailer; 3rd party integrator
Target Outcome or Benefit	• Supports greater customer choice of value-stacking opportunities and service providers. • Reduces the integration and operating costs of organisations sending and receiving prices signals. • Provides a flexible foundation for future pricing products and services.	
Implementation Challenges & Risks	• Current trials and expected regulatory changes to enable dynamic pricing. • Achieving alignment on data definitions and structures across all stakeholders. • Interlinking impacts with DOEs and trade of Local Network Services.	

Parent Use Case – Supporting Local Network Services

Overview	Procurement of CER-based flexibility services is an emergent solution to managing network congestion and constraints without physically building new or augmenting existing network infrastructure. The Exchange could support with a high-trust ecosystem and standardised transactions to scale the trade of these services. This use case could support data exchange during parts of the service lifecycle, including the discovery, registration, triggering, and delivery verification.	
Problem Statement or Need	International experience (particularly in the UK) suggests that an organic, fragmented approach to procuring network support services can present significant barriers and prevent the full value of CER flexibility from being realised. A common, accessible, transparent, and holistic approach to data exchange is one way to reduce the costs of trading these services whilst still enabling DNSPs to manage the trade of these services separately.	

Data Journey	1. DNSPs identify service opportunities and define the service requirements separately to the Exchange.
	2. DNSPs establish Local Network Service market/exchange software to engage in the trade/procurement of services, which is separate but integrated with the CER Data Exchange. The CER Data Exchange would support standardised transactions between parties during some stages of the service lifecycle, including:
	  ○ DNSPs engage with CER customer agents leveraging source of truth IDAM and portfolio management data accessed through the CER Data Exchange
	  ○ DNSPs broadcast pre-arming/dispatch signals to registered customer agents.
	  ○ Exchange of performance data to verify conformance with the service request.	

Actors	**Data Producers** • DNSP; retailers; aggregators; OEMs; 3rd party integrators	**Data Users** • Retailers; Aggregators; OEMs (including EVSE providers and operators); 3rd party integrators; DNSP; TNSP; AEMO (for visibility at scale); Regulatory and Government bodies
Target Outcome or Benefit	• Reduces integration costs for parties to transact Local Network Services at scale. • Supports entry of new service providers by lowering information barriers. • Greater customer choice of and access to value-stacking opportunities through improved visibility and participation by a greater number of service providers. • Provides a flexible foundation for making Local Network Services a business-as-usual activity in a high CER NEM.	
Implementation Challenges & Risks	• Standardisation of NEM Local Network Services definitions, transaction message structures, and communication requirements. • Visibility to support DOEs and dynamic prices.	

Parent Use Case – Accessibility of Market Prices

Overview	AEMO publicly shares a wide range of market clearing prices and forecasts from running the wholesale energy market and ancillary services. This use case broadcasts price forecasts and clearing prices to a wide range of organisations, including non-market participants. This option can enhance decision-making, foster new services and create a more transparent competitive market at lower cost. Formerly referred to as "Transparency of Market Prices" in Workshop 2.	
Problem Statement or Need	These prices can be accessed in a way that is machine-readable by registered market participants through market systems but non-registered parties must download files from AEMO's website which are formatted in a way that is difficult to work with. These current practices limit access to price information that in turn creates barriers for new entrants and potential innovators because access to public pricing information is unnecessarily unequal.	
Data Journey	1. AEMO securely sends market price data to the Exchange. 2. Participating organisations set up subscriptions to different pricing information based on needs. 3. Subscribers receive data through their chosen subscriptions. 4. Historical pricing information could be stored for analytical and reporting purposes in the future.	
Actors	**Data Producers** • AEMO	**Data Users** • Retailers; Aggregators; OEMs (including EVSE providers and operators) DNSP; TNSP; Regulatory and Government bodies; Research; Advisory, financial services and any other interested party
Target Outcome or Benefit	• Lowers barriers to market entry by providing open access to key price information. • Enables development of innovative products and services based on immutable, authentic data. • Creates a flexible foundation for future pricing mechanisms and market or service arrangements.	
Implementation Challenges & Risks	• Avoiding the creation of onboarding processes that could act as barriers to entry.	

Parent Use Case – Flexibility Service Requests

Overview	Enable retailers to be able to broadcast a structured flexibility service or price request to organisations that represent their entire CER customer base, through a common interface, facilitating greater demand-side participation within their wholesale portfolio and coordination of CER in the energy market. This is more sophisticated than behavioural demand response and enables retailers to coordinate CER that is not part of their specific VPP platform, providing customers with greater choice on how their CER can participate in electricity services (either in/out of a VPP)	
Problem Statement or Need	The market does not currently have a capable and scalable solution for retailers to efficiently communicate flexibility needs to all potential participating CER at scale. This limits the market's ability to utilise demand-side flexibility and consumers access to more value-stacking opportunities. In order to send signals to customers' CER, retailers need to establish and maintain integrations with every CER original equipment manufacturer (OEM) or an integration aggregator, adding cost and restricting scale.	
Data Journey	1. Retailers identify need for flexibility and generate contractual agreements off-Exchange. 2. Retailers broadcast a standardised flexibility service request to either select organisations or the entire aggregator/OEM of users connected to the Exchange that have flexibility agreements with their retail customers. 3. Aggregator/OEM organisations consider responding to the request amongst other value-stacking options, network limits and customer preferences and coordinate their customers' CER resources accordingly. For instance, smart hot water could heat, or PV inverters could reduce exports in response to negative price periods. 4. Service providers send data to demonstrate conformance with the flexibility request. 5. Settlement occurs separately to the Exchange.	
Actors	**Data Producers** • Retailer	**Data Users** • Aggregators; OEMs (incl EVSE); DNSP; 3rd party integrator, AEMO (for visibility at scale)
Target Outcome or Benefit	• Greater customer choice to save money through broad-scale demand-side participation that improves reliability and reduces costs for all consumers. • Supports the development of new non-market flexibility services and products - creating more value-stacking opportunities for consumers. • Reduces integration costs by standardising data exchange. • Provides access to more CER flexibility and enables efficient price responses for Retailers.	
Implementation Challenges & Risks	• Requires customers to consent to a 'Customer Agent' (retailer, aggregator or OEM) to coordinate their CER on their behalf • Retail market readiness for flexibility services • Standardisation of flexibility definitions, transaction terms, and communication requirements	

Parent Use Case – Visibility of CER Customer Choices

Overview	Provide a secure way to share and access 'source of truth' CER capabilities and commitments to access many opportunities. This option can dynamically provide transparency about CER asset portfolio registrations, credentials and changes without duplication.	
Problem Statement or Need	Current systems and processes lack a unified method to record and dynamically share CER customer choices with relevant and authorised organisations. This leads to inefficiencies in customer switching processes, portability of preferences to other service providers, or new services that support customers moving into a new premise with CER already installed and integrated.	
Data Journey	1. Customers make different choices regarding their CER, typically marked by explicit informed consent to one or multiple service providers / Customer Agents (retailers, aggregators, OEMs). 2. Customer agents register, record, and roster these choices in a system of record. 3. Updates to customer choices are made once in a system of record and are dynamically reflected on an event basis throughout the ecosystem. 4. Relevant customer choice information could also be dynamically drawn upon when verifying customer-actor-asset relationships, informing data partitioning or enriching certain datasets.	
Actors	**Data Producers** • Retailer; aggregator; OEM; CER installer	**Data Users** • Retailer; aggregator; DNSP; TNSP; Regulatory and Government bodies; Ombudsmen and consumer advocacy groups; Product developer; Research
Target Outcome or Benefit	• Reduces integration costs for making and updating CER portfolio information • Supports customer choice and improve switching between CER service providers • Provides a flexible foundation for megawatt scale CER portfolios delivering multiple services across multiple jurisdictions. • Introduce innovative products/services, and ensure consistent data availability at less cost and risk.	
Implementation Challenges & Risks	• Recording and authenticating customer consent across multiple services/jurisdictions. • Ensuring data accuracy and timely updates across diverse CER types and owners. • Managing complex access rights and consent mechanisms.	

Parent Use Case – Streamlined CER Portfolio Data Access

Overview	Provide a secure way to share and access 'source of truth' CER capabilities and commitments to access many opportunities. This option can dynamically provide transparency about CER asset portfolio registrations, credentials and changes without duplication.	
Problem Statement or Need	There is no fit-for-purpose source of truth for what CER is in each Customer Agent's portfolio and what services they are delivering, which can be shared between authorised stakeholders. This results in inefficiencies, such as duplication of information, conflicting information and barriers to streamlined CER customer/portfolio switching at scale.	
Data Journey	1. Customers choose CER service providers and sign up (with their specific CER assets) to different value-stacking services with Customer Agents (retailers, aggregators, OEMs). 2. Customer Agents submit this information with proof of customer consent to a relevant authority with access to a new system of record as a shared 'source of truth' for CER assets, CER services, CER service providers and portfolio management. 3. Authorised organisations are given access to view / manage information in the system of record. *4.* Updates to asset, service and portfolio information (such as new assets, service qualifications or opting in/out of a services) are synchronised with authorised organisations across the ecosystem.	
Actors	**Data Producers** • Retailer; aggregator; OEMs; DNSP	**Data Users** • Retailer; aggregator; OEMs; DNSP; TNSP; AEMO; Regulatory and Government bodies; Ombudsmen and consumer advocacy groups; Product developer; Research Groups
Target Outcome or Benefit	• Reduces integration costs for making and updating CER portfolio information • Supports customer choice between CER service provider portfolios • Provides a flexible foundation for megawatt scale CER portfolios delivering multiple services across multiple jurisdictions.	
Implementation Challenges & Risks	• Recording and authenticating customer consent across multiple services/jurisdictions. • Ensuring data accuracy and timely updates across diverse CER types and owners. • Managing access rights and consent mechanisms.	

Parent Use Case – Consistent CER Standing Data

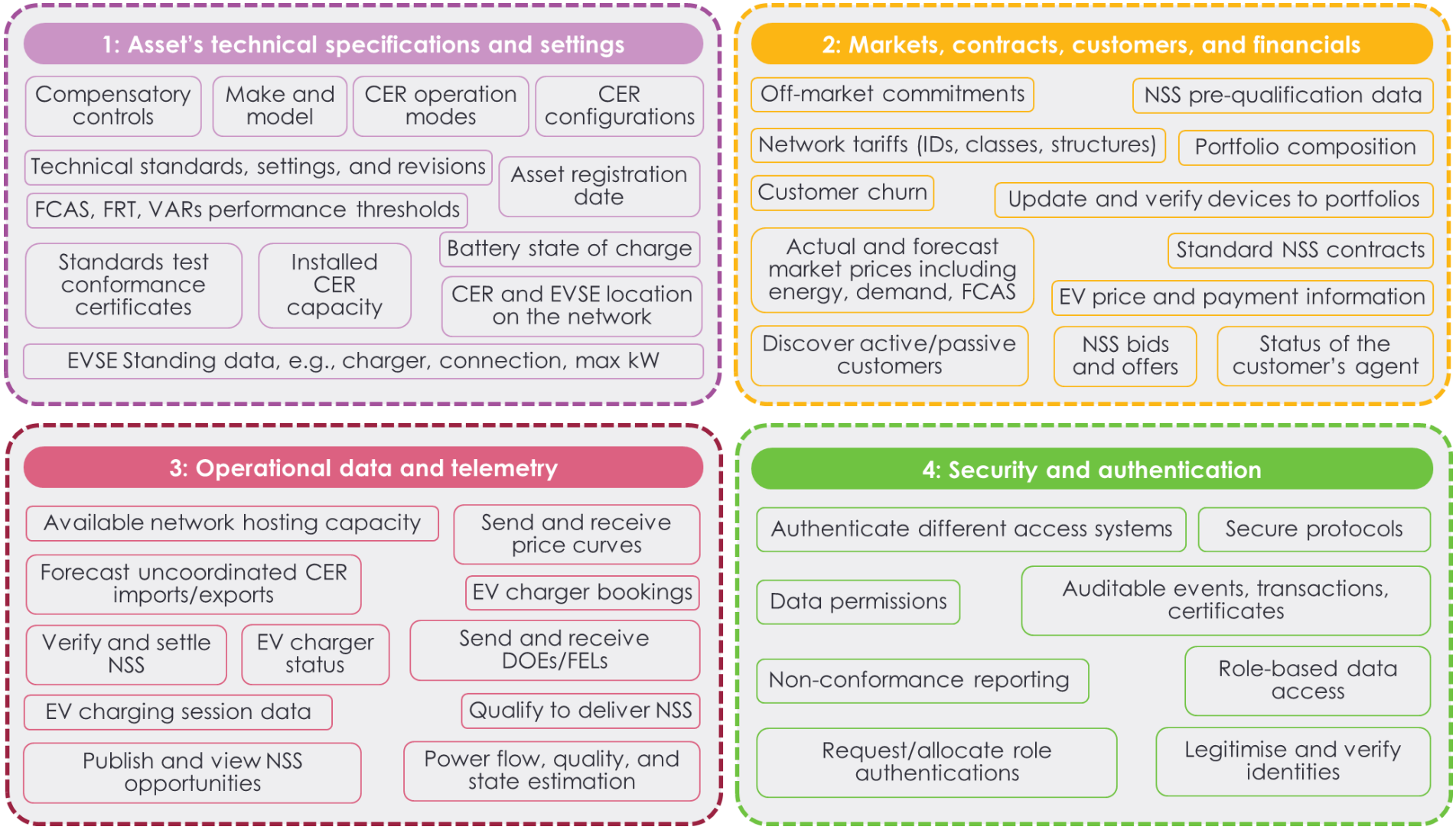
Overview	Addresses a need for changes made by many organisations to CER standing data, such as firmware updates or settings to prove compliance to technical standards, for many organisations to receive an update-to-date view of CER device capabilities in a secure, consistent, and auditable way.	
Problem Statement or Need	Current systems and processes for CER asset registration and metadata management are manual, duplicated, disparate, rely on incomplete data sets, and lack integration. This impacts the entire power system value chain through lack of data reliability through inconsistencies, inefficiencies, and barriers for new products and services to be made.	
Data Journey	1. Organisations involved in the initial CER connection process input standing data at a point in time. 2. Authorised organisations could subscribe to relevant CER standing data updates. 3. Authorised organisations update the standing data in a system of record on an event basis (e.g. decommissioning, upgrading or changing system settings), with the changes made available to relevant organisations and databases across the ecosystem. 4. Historical or versioned data changes could be retained in a system of record for product development, compliance monitoring or reporting purposes.	
Actors	**Data Producers** • Retailer; aggregator; OEM; CER installer; DNSP	**Data Users** • Retailer; aggregator; OEM; DNSP; TNSP; AEMO; Regulatory and Government bodies; Research
Target Outcome or Benefit	• Reduce administrative costs of manual, duplicate data entry processes and improves service registrations. • Supports product and service innovation by keeping CER capabilities up to date. • Creates a flexible foundation for future CER types and participation models. • Simplifies operational planning and proving compliance with standards once.	
Implementation Challenges & Risks	• Ensuring data accuracy and timely updates across diverse types and data producers. • Developing a comprehensive, yet flexible standard data model for standing data. • Improving the operational state of devices is a higher priority for stakeholders. • Capability to handle dynamic updates and maintain data integrity across the ecosystem.	

Parent Use Case – Support EV Uptake and Integration

Overview	Support consumer confidence in public EV charging infrastructure by making standardised data available (such as EVSE availability, reliability, current operating status, and capable of receiving dynamic pricing).	
Problem Statement or Need	There are no current requirements for EVSE operators to make standardised information available for services providers to offer insights to consumers on EVSE availability, reliability, operating status, and pricing. This means consumers feel charger anxiety that restricts EV uptake. EVSE operators would need to connect to CER Data Exchange to receive Dynamic Operating Envelopes (DOEs) or Flexible Export Limits (FELs) (Priority Use Case 1) and share data to demonstrate DOE conformance and would therefore also be able to share other information as required to support consumer confidence in public EV charging infrastructure.	
Data Journey	1. Policy makers create new requirements for public EVSE operators to share standardised data to support consumer confidence in public infrastructure (e.g. EVSE availability, reliability, operating status, and dynamic pricing). 2. EVSE operators connect to CER Data Exchange and share required standing and operational data. 3. Authorised stakeholders access data and create applications to visualise or create intuitive ways that customers can consume insights on EVSE availability, reliability, operating status, and pricing, for instance in a digital map available on their smart phone. 4. Consumers have trusted access to data insights covering all public EVSE across jurisdictions that require this data to be shared. 5. Historical data could be maintained in a system of record for analysis, research, and reporting.	
Actors	**Data Producers** • EVSE operator; Systems of record, such as DER Register as record of EVSE; Mapping and navigation service	**Data Users** • Aggregator; EVSE provider and operator; Retailers; DNSP; AEMO; Regulatory and Government bodies; Car parking facility manager; Mapping and navigation service providers
Target Outcome or Benefit	• Reduces integration costs through a standardised data exchange process. • Enables innovation in EV-related products and services. • Provides a flexible foundation for future V2G applications. • Enable seamless, market-wide participation for consumers and EVs.	
Implementation Challenges & Risks	• Setting regulations to require standardised data to be shared. • Suitability and capability of current systems of record, such as the DER Register. • Data privacy related to EVSE locations and usage patterns.	

A4.1 Long List of Use Cases

This appendix outlines a long list of use cases provided by stakeholders and from the literature review which have since been filtered as priority, strategic or additional. This list is provided for transparency and to inspire other use case ideas in stakeholders.



A5. Literature Review

Below is an extensive literature review undertaken by the project team on related projects and frameworks that can provide further insights into the development of the Customer Energy Resources (CER) Data Exchange. This review includes examples of similar initiatives, key technical frameworks, and relevant policy documents from both Australian and international perspectives.

Project EDGE (Australia)

Project EDGE, led by AEMO in collaboration with several industry partners including AusNet Services and Mondo Power, was a 3-year practical research project focussed on the NEM. It demonstrated a proof-of-concept two-sided market arrangement that enables efficient and secure coordination of aggregated CER, and facilitates the delivery of both wholesale and local network services within network limits at the grid edge. The project focused on establishing a framework for efficiently managing CER and aimed at understanding how data can be effectively exchanged between market participants to optimise CER usage.

1. **Project EDGE Overview**: This infographic offers a visual summary of the key achievements, goals, insights and components of Project EDGE. It includes a concise overview of the data-sharing infrastructure and how it supports energy transition goals in the NEM. Project EDGE Infographic
2. **Final Report - Data Hub Chapter**: The data hub (similar to the CER Data Exchange concept) was a central feature of Project EDGE, designed to streamline the data flow between participants. The final report (pages 127-144) provides detailed insights into the technical, operational, and governance considerations for a data hub to facilitate efficient data exchange in a complex market ecosystem. Project EDGE Final Report

United Kingdom Digital Spine

The United Kingdom Digital Spine is an initiative aimed at enabling effective, interoperable data-sharing across the energy sector, addressing challenges such as siloed information and inconsistent data standards. It provides an interesting reference for developing a similar centralised data exchange model in the Australian context.

3. **Digitisation Taskforce Report**: This report from the Energy Systems Catapult outlines the broader vision of the UK's energy digitisation, the key elements of the Digital Spine, and the anticipated benefits for data-sharing efficiency, innovation, and customer empowerment. Digitisation Taskforce Report
4. **Digitisation Taskforce Delivery Recommendations**: These pages provide detailed recommendations for the rollout and integration of the Digital Spine into the broader energy system. Emphasis is placed on collaboration between market operators, data standardisation, and ensuring an adaptable regulatory environment. Delivery Recommendations Report
5. **Digital Spine Feasibility Study**: This report summarises the findings and conclusions of the six-month feasibility study into an energy system digital spine, developed through a stakeholder-led, collaborative, and consultative approach with 100+ cross-sector engagements. Feasibility Study Full Report Feasibility Study Executive Brief

Ofgem's Future of Distributed Flexibility (UK)

Ofgem, the regulator for electricity markets in the UK, is actively shaping frameworks to facilitate distributed flexibility as part of a modernised grid, which offers key lessons for the Australian context.

6. **Consultation Paper on Distributed Flexibility:** This paper details Ofgem's vision for integrating distributed flexibility into the electricity network, with a focus on ensuring consistent standards for data-sharing. The consultation highlights the role of consumer energy data in achieving a more flexible and resilient grid. Ofgem Consultation Paper
7. **Technical Exchange Archetypes**: This document explores technical exchange models and archetypes for distributed flexibility. It provides practical insights into the types of infrastructure required to support such exchanges, including considerations for data formats, security, and scalability. Technical Exchange Archetypes

Consumer Data Right (CDR) Framework - Australia

The CDR is a key regulatory framework designed to empower consumers by providing them with more control over their data. The CER Data Exchange could build on CDR's consent framework as a supporting tool for dynamic, multi-party data exchanges.

8. **ACCC CDR Guidelines:** The ACCC has developed guidelines that provide the regulatory framework for implementing CDR in Australia, including specific guidelines for data privacy, consumer consent, and operational security. CDR Guidelines

Australian Energy Sector Cyber Security Framework (AESCSF)

The AESCSF provides a structured approach to assessing cyber security maturity for managing cyber risks in the energy sector. The design of the CER Data Exchange consider the AESCSF to safeguard the security and integrity of shared data and ensure resilience against emerging threats.

9. **AESCSF 2023 Report**: The report outlines the current landscape of cybersecurity risks in the energy sector and provides guidelines for implementing cyber controls to secure critical infrastructure, including data exchanges. AESCSF Report

Australian Privacy Principles (APPs)

The APPs, outlined in the Privacy Act 1988, provide the foundation for how personal information must be handled in Australia. Compliance with the APPs is critical to ensuring that consumer data within the CER Data Exchange is managed ethically and securely.

10. **Privacy Act 1988**: AEMO must ensure that data privacy, security, and consumer consent are in line with national regulations under the Privacy Act 1988. Privacy Act Overview

Related Projects and Case Studies

11. **California Distributed Energy Resource Projects:** California's approach to integrating Distributed Energy Resources (DER) offers key lessons regarding regulatory reforms, the importance of scalable technology, and efficient consumer participation models. California Energy Commission - DER Overview
12. **European Union Clean Energy Package:** The EU's Clean Energy Package is instrumental in developing an integrated and consumer-centric energy system. Its emphasis on data-sharing transparency and consumer empowerment offers relevant insights into designing similar systems in Australia. EU Clean Energy Package

This literature review serves as a foundation for stakeholders to understand the various frameworks, technical standards, and regulatory environments that influence the CER Data Exchange. Each of the projects and references discussed provides insights into best practices for building a robust, adaptable, and compliant data-sharing platform that will facilitate the transition to a more resilient and consumer-focused energy market. Stakeholders are encouraged to explore these references to gain a deeper understanding of the proposed models and options discussed in the CER consultation paper.