ENERGY SECURITY BOARD DATA STRATEGY FINAL RECOMMENDATIONS

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Abbreviations and Technical Terms

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CBA	Cost Benefit Analysis
DCA	Dedicated Connection Assets
DNA	Designated Network Assets
ECA	Energy Consumers Australia
ESB	Energy Security Board
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
REZ	Renewable Energy Zone
TNSP	Transmission Network Service Providers

1. Executive Summary

The energy system is dramatically changing as the resource mix transitions. Digitalisation and data are critical foundations. Coordinating a secure and affordable energy system of diverse renewable and distributed technologies, with consumer services at the centre, is achievable but depends on the opportunities that digital technologies and data bring.

Consumers can now access specialised products and potentially multiple service providers. Improved insights and leadership are required to ensure that consumers, industry, and government can take advantage of this change.

The ESB Data Strategy addresses these challenges, providing direction for the data management needed to:

- *Manage changing data needs in the energy transition, and*
- *Optimise the long-term interests of energy consumers in a digitalised economy.*

The benefits of improved data access

It is important that customers, market participants, operators and policy makers have the data they need to respond to these changing circumstances. Inefficiencies associated with data gaps or access have contributed to customer affordability and security challenges in recent years. Current and emerging challenges include:

- **Customers:** Are exposed to more choice and innovative products and services and need easy access to clear information to make those choices. Improved data services are critical to facilitate this.
- **Service providers:** Service providers and new entrants will benefit by improved access to customers data. Currently only incumbent retailers have access to historic data for a large number of consumers, allowing them to analyse and target services in a way new entrants cannot. Current data gaps create barriers to innovation that can deliver benefits to customers.
- **Network operators:** Network operators are already managing significant volumes of distributed energy resources (DER) on their networks and making decisions on DER export constraints and local network needs. As the penetration of solar PV, EVs, batteries and flexible demand services increases, visibility of DER is essential to support network operators in managing the system security needs effectively.
- **Market bodies:**
    - **Regulation:** More products and greater diversity of retail models means there is a need for additional data to identify and assess emerging risks to customers. Additional data will allow regulators to monitor customer outcomes, ensuring protections remain fit for purpose as products and services evolve.
    - **Market development:** Markets need to evolve and adapt, particularly over this period of rapid transition. Information is needed to monitor market participants, assess emerging trends and how customers are responding.
    - **Planning and operations:** The Integrated System Plan (ISP) and planning activities are critical to transmission development. Access to timely and accurate data can inform the development of Renewable Energy Zones (REZs), and broader investment decisions by participants. Data such as that published by AEMO in the Electricity Statement of Opportunities (ESOO) is fundamental to development of future market mechanisms, including a proposed capacity mechanism. From an operational perspective, access to timely data and enhanced visibility of resources is critical to AEMO and network businesses in a highly distributed environment.

- **Policy Makers and Researchers:** Improved access to data can lead to better policy outcomes for consumers and improved monitoring of consumer protections. Directions for reforms have been proposed by the ESB for all Post-2025 market design pathways. It is important that progression of these reforms along these pathways is informed by timely and accurate information.

Key data gaps remain

Digitalisation of the energy market is well underway. Despite this, decision makers across the energy sector, from customers to planners, service providers to regulators, frequently cannot access the data they need. A lack of information will mean less certainty, discouraging investment and placing unnecessary costs on consumers. Access to relevant data can better target research outcomes, guide effective policy and enable informed decision making. Key issues remain, including that:

- The current regulatory frameworks often prohibit effective sharing.
- Processes and systems needed to share, coordinate, and use data safely are often missing, leading to costly attempts to negotiate *ad hoc* solutions and delays in addressing sector-wide needs.
- Current systems are not able to keep pace with new technologies, which are creating new data needs, particularly in the areas of distributed energy technologies and consumer decision-making and billing.

These challenges require a coordinated approach.

The Data Strategy addresses these concerns through its four key pillars:

- **New Framework:** Introducing new guiding policy principles and regulatory reforms to remove existing barriers to better consumer outcomes, support safer data management, and ensure frameworks are fit-for-purpose in a future energy market.
- **Capability building:** Building leadership, coordination and capability across agencies and stakeholders, to better manage data growth, grow value from analytics and support the data services the market needs.
- **Priority data gaps:** Filling gaps in current data sets, critical to support the *needs today* of better planning, evolving services and robust consumer protections.
- **Forward planning and adaptability:** Introduce regular proactive review and planning to meet *needs tomorrow*, timely standards, flexibility in data arrangements, and facilitating early needs for research and innovation.

This approach provides ongoing support for changing data needs over time, with coordination of proactive reviews to identify and address emerging and future priority data gaps and capabilities. All guided by a new framework which sets clear principles and safe but flexible requirements.

Implementation

Implementation of the Data Strategy is proposed to begin immediately in 2021-22 and, with input and support from jurisdictional officials, will:

1. **Immediate measures**:
    - initiate a new Data Leadership and Coordination working group (DataLAC) to be led by ESB and market bodies
    - implement energy data principles and core capabilities to drive the Strategy over time, including an expert Data Reference Group

- develop the first stage of legislative reforms and support common guidelines and options for a new data services model to unlock value from existing data sets, to support policy and planning for the future NEM.

2. **Initial measures**:
   - design and cost options to address the top five priority data gaps: Network transparency, Overvoltage, electric vehicle (EV) transparency, Updating consumer research, and Bill transparency.
   - identify additional priorities warranting near term action based on their importance to customers in the evolving NEM and the need for a coordinated effort to resolve them.

3. Longer-term measures
   - design a new legislative framework which is fit-for-purpose and adaptable in rapidly evolving digitalised future.
   - establish regular forward reviews to ensure a proactive, responsive approach to changing data needs, including in engagement on advance research data needs.

Recommendations

1. **The ESB recommends Energy Ministers:**

   a) **agree** to support implementation of the Data Strategy as a foundational measure towards the future NEM. The strategy will establish new national frameworks, based on the new energy data policy principles within the strategy, governing management and use of data. This will remove barriers to the enhanced access to, and sharing of, data necessary for improved energy consumer outcomes in a digitalized energy sector.

   b) **note** that priority data gaps to be resolved are proposed to include data needs relating to electric vehicles, network transparency, consumer research and consumer bill transparency.

   c) **note** that through immediate and initial reforms implementing the strategy, it will deliver the following outcomes:

      i. consumer energy needs will be better recognized, and vulnerable consumers better supported by improved consumer and billing data insights

      ii. improved planning and optimisation across the system, particularly in local networks, due to a better understanding of the impacts of flexible demand and DER assets

      iii. improved research, policy outcomes and decision making in the energy industry by ensuring relevant organisations benefit more from safe and effective data sharing

      iv. stronger and more coordinated leadership to close key data gaps.

   d) **instruct** the ESB monitor and provide advice about forward priorities, changing data needs and risks in the context of the NEM. Forward reviews are to be presented and discussed with senior officials on an annual basis, with 6 monthly progress reporting.

2. Introduction

One of the recommendations of the Finkel Review was that the Energy Security Board (ESB) develop a data strategy for the National Energy Market (NEM).[1] The ESB has also been tasked by former Council of Australian Government Energy Council (COAG EC) to deliver a market design for the NEM that meets the needs of the energy transition and beyond 2025 (the Post-2025 program).

Work on the Post-2025 electricity market design addresses essential change in the NEM in a world of expanding consumer choices, new technologies, and extensive capital replacement as old thermal power stations exit and new renewable resources connect to the system.

The ESB Data Strategy has been developed as a critical foundation for this future energy market.

The scale and pace of change occurring across the NEM cannot be overstated. Over the past decade, the resource mix and technologies meeting our energy needs, as well as changes to how we consume, and access energy has undergone a transformation. There are now close to 3 million households with solar PV on their rooftops in the NEM. Together they now contribute more energy (which is at least twice as large as the single biggest generator in the NEM).

Foundations to support these changes are essential to keeping the system secure and making sure customers can get the most value from reduced energy bills, more innovative products, and simple easy to access choices. Growing data capabilities and digital technologies provide the effective tools to coordinate and inform decisions across the sector. They are vital in managing future markets with greater variability, diversity, and fragmentation. Digitalisation provides unprecedented opportunities to create a smarter, more affordable, responsive, and flexible system.

Current data management demonstrates that growing these new capabilities will be challenging. Significant gaps exist in data needed today, with major hurdles in both regulatory frameworks and capabilities delaying outcomes and incurring costs for consumers. These challenges will not be overcome without the major reforms the ESB Data Strategy lays out.

The ESB Data Strategy is proposed as an ongoing governance approach to address barriers and build capabilities associated with data reform in the energy sector.

2.1 Process

The Finkel Review regarded a Data Strategy as a critical governance requirement in the context of rapid change and digitalisation in the market and tasked the ESB in its development. The ESB commenced this work in 2019, building on initial work undertaken by the Australian Energy Regulator (AER) in 2018.

The ESB Data Strategy has been developed collaboratively by a working group across the energy market bodies[2] and the Australian Government, with extensive stakeholder input. It was also developed in parallel with the Post-2025 market design reforms. Recommendations in the Data Strategy are a key enabler for these reforms.

The Data Strategy builds on a range of key inputs, including:

1 Independent Review into the Future Security of the National Electricity Market, Blueprint for the Future, June 2017; recommendation 7.14.

2 The energy market bodies include the Australian Energy Market Commission (AEMC), the Australian Energy Market Operator (AEMO) and the Australian Energy Regulator (AER).

- an in-depth legal review of data regulation within Australian energy frameworks and a review of case studies in international data reforms. This review was led by King & Wood Mallesons (KWM) and Galexia, working with the market bodies, and was released for consultation in October 2020.[3]
- a review of gaps in data requirements, undertaken by the AER with the Brattle Group.[4]
- policy directions and progress in national data reforms, including the Consumer Data Right (CDR), Data Sharing Principles and the Data Availability and Transparency Bill.
- data concerns identified across a range of relevant processes, such as the Distributed Energy Implementation Program (DEIP), the ACCC Retail Electricity Pricing Inquiry (REPI), and the National Energy Analytics Research program (NEAR).

The ESB released a consultation paper for the Data Strategy in October 2020 identifying 32 recommendations. The consultation received 27 submissions from across the sector, supplemented by a public webinar and over 20 targeted sector workshops. Submissions provided broad support to reform data regulation and build supporting capability, with stakeholders recognising the increasing need in this area. The ESB thanks stakeholders for their considerable time and input.

This paper provides final recommendations to Ministers including a specific implementation approach and priority reforms for the first year of the strategy.

[3] ESB Data Strategy Preliminary Legal Report, prepared by KWM and Galexia can be found here: https://energyministers.gov.au/publications/energy-security-board-data-strategy-submissions-consultation-paper-published

[4] NEM Data Strategy Consultation Paper, 20 March 2018 can be found here: https://energyministers.gov.au/publications/energy-security-board-data-strategy-submissions-consultation-paper-published

3. Why a data strategy

With the energy system and market undergoing transformational change, it is critical we have the foundations to deliver the greatest value, manage risks to affordability and protect customers and the system. A coordinated data strategy is a key enabler to making sure we have the right systems, processes, and visibility of information. Access to relevant data can better target research outcomes, guide effective policy and enable informed decision making. Getting these settings right across the NEM supports innovative service offerings, enables higher uptake of renewable and low emission technologies, reduce inefficiencies associated with poor operational and investment decisions, and supports more affordable energy outcomes for households, businesses, and communities.

Key challenges addressed by the Data Strategy

- Make sure customers, market participants, operators and policy makers **have the data they need** to make efficient and effective decisions. Inefficiencies associated with data gaps or access have contributed to customer affordability and security challenges in recent years.
- Manage risks of not addressing the **increasing data needs** that come with a future NEM characterised by cleaner technologies and consumer-driven services. A clean energy system must be smarter.
- Address growing consumer expectations driven by **economy-wide digitalisation**, and the new requirements for the energy sector from associated national data reforms.
- **Coordinate action** to fill critical gaps and expedite the new digital capabilities that are developing across the sector.

3.1 Data gaps have real costs

Energy decision makers today often do not have the data they need to make efficient and effective decisions. This includes customers, market participants, new entrants, planners/forecasters and policy makers. This is not a new issue, but the rapid uptake of digital technologies and increasing data needs has put a spotlight on where challenges exist.

These data gaps have already led to avoidable inefficiencies, costs and risks for consumers, and have contributed to affordability and security challenges of recent years. Data gaps are frequently caused by relevant decision makers not having access to relevant data, even if sharing the data would clearly be in the wider interests of consumers. This can be due to out-of-date requirements in energy regulatory frameworks, lack of processes to manage and share data, or lack of incentives for parties to make data available.

Examples of data gaps today include:

Consumers:

- Consumers currently make choices on new energy plans and solar PV systems without easy access to data on how they use energy, what the best services for them may be or whether they will be better off with the choice made. For example, a household where people leave to go to work during the day are likely to derive much more benefit from a battery than those who stay at home during the day. Households with diverse usage patterns will benefit from better data to help them understand their individual circumstances.

- Consumers have had the right to access their own meter data and to share it with their other service providers since 2014,[5] with an obligation on retailers and networks to provide it. However, a lack of required common processes, such as common identification verification and data standards, to facilitate this, means that most consumers still struggle to gain access or only access it in a form which limits portability.
- The Energy Consumers Australia (ECA) Consumer Sentiment Survey[6] indicates that only around half of consumers feel confident they have enough information to make energy decisions.

Planning and forecasting:

- System planners, forecasters and market participants have had to forecast demand with limited visibility of current demand and many unseen factors driving consumer change, including uptake and impacts of new technologies such as air conditioning units, energy efficient technologies and solar PV. This has led to key challenges forecasting major changes in demand.[7]
- These forecasting challenges are a contributing factor to price rises over recent decades. When demand fell unexpectedly, higher forecasts contributed to over-investment in networks.[8]
- Development of network support services. At present, most 'demand management' is focussed on reducing load during high price periods. Essentially, demand management is a substitute for peaking generation, however, it can also be an efficient substitute for network investment. Greater visibility of load profiles would help Distribution Network Service Providers (DNSPs) to develop non-network alternatives to network upgrades. For instance, if particular customer behaviours during a small number of peak periods are driving a need to upgrade a substation, there may be opportunities for the DNSP to work with customers to develop mutually beneficial alternative solutions that are much cheaper than a substation upgrade.

Policy makers and regulatory bodies:

- Policy makers make significant investments in programs to trial new technologies and address concerns around vulnerable consumers or exposed sectors. However, access to data and metrics to measure the impact of these measures and evaluate consumer benefits (or to target the measures to specific needs from the outset) is inadequate. This reduces benefits and learnings from the programs and limits improvement in future programs.
- Similar challenges are experienced with customer surveys / trials where limits on consumer consent, due to lack of clear requirements or advice, means findings are unable to be shared.
- Only retailers can currently see what consumers pay for energy. No other party can currently access usage data, tariffs, or bills, in a way that could support broad statistical analyses or understanding of ongoing impacts on consumers.[9] This is a major challenge for consumer protections, retail

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5 See Rule 7.7, NERs, version 66.

6 The ECA Customer Sentiment Survey for 2020 can be found here: https://energyconsumersaustralia.com.au/wp-content/uploads/Energy-Consumer-Sentiment-Survey_June-2020.pdf

7 Analysis of forecasts from AEMO Electricity Statement of Opportunities, 2004-2020

8 Analysis of AEMC Residential Price Trends, 2009-2018

9 This was a concern raised in the ACCC Retail Electricity Pricing Inquiry (REPI). Current sources are limited to high-level aggregation provided by retailers or surveys with explicit provision of a bill (as most consumers can't identify their tariff) which rarely support an analysis of comparable bills over 12 month or ongoing impacts. This report can be found here: https://www.accc.gov.au/regulated-infrastructure/energy/retail-electricity-pricing-inquiry-2017-2018/final-report

transparency and wider consumer policy. Regulators and policy makers have limited access to data to evaluate how consumers are impacted by different policies and services (e.g., the Default Market Offer (DMO) / Victorian Default Offer (VDO), impact of COVID or services for vulnerable consumers), making it challenging to monitor consumer protections, to assess and advise jurisdictions on retail margins, or design or test policy options.

- Regulators monitor retail market prices based on prices offered in the market but without clear visibility of which tariffs consumers are actually on or what consumers really pay. Published estimates for consumer bills vary widely (based on different methodologies) and provide no insights into impacts on different consumer segments.
- Distribution tariff reform – changes to the structure of distribution tariffs will redistribute who pays for network costs. For instance, if networks move towards time of use charges, customers that use their power predominantly during peak periods are likely to have higher bills. Making more granular data available to parties responsible for tariff reform (DNSPs and the AER) will help to ensure that restructuring is targeted towards delivering more efficient outcomes, without disproportionately impacting any customer group. As tariff structures change, better data will also help customers adapt their behaviour in ways that reduce their bills and overall system costs.

Research and innovation

- Trusted research and policy bodies typically can't access meter data, bill data or related network data, even in a de-identified manner. Industry research partnerships can also struggle to access data, with significant delays in negotiations. This limits outcomes for reform and delays benefits from research effort underway across the sector to progress trials and research critical areas associated with DER integration, uptake of EVs, changing consumer behaviour and impact of programs for vulnerable customers. These data gaps can lead to sub-optimal policy outcomes and so increased costs to consumers.
- Service providers and new entrants often struggle to improve services, with barriers to accessing their customers data. Incumbent retailers have access to historic data for a large number of consumers, allowing them to analyse and target services in a way new entrants cannot. Data gaps create barriers to innovation that otherwise can deliver benefits to customers.

In future, with increasing penetration of DER and more diverse services being offered to energy consumers, these gaps can lead to both increased costs as well as systems challenges. For some emerging data needs, data simply doesn't exist. Investment in new systems or requirements is needed to resolve these gaps. Examples include:

- Network operators are already managing significant volumes of DER on their networks and make decisions on DER export constraints and local network needs. These decisions are often made with limited visibility of local DER capacity, its local impact or how balance is best managed.[10] This means that management of these systems must be conservative and can lead to constraints on consumer owned generation. As the penetration of solar PV, EVs, batteries and flexible demand services increases, visibility of these resources will be essential to support network operators in managing the system security needs without limiting consumer benefits. For example, flows across distribution networks are changing with the result that parts of the network that have historically been sources of load (e.g., residential areas) are becoming net suppliers of electricity at certain

[10] SA Power Networks (SAPN), the distributor with the highest DER penetration in the world, is actively investing in building analytics and a range of DER management mechanisms. However, based on their regulatory proposals to expand network monitoring, to date it has visibility less than 5% of LV nodes. They rely instead on data from a range of trials and modelling.

times. As this becomes more common, there is a risk that emergency interventions intended to shed load may actually have the opposite effect. If under-frequency load shedding schemes inadvertently worsen the gap between supply and demand, system security could be comprised. To avoid this, AEMO and DNSPs require visibility of real time data flows across the distribution network.

- Delays in the development of standards for inverters mean that many DER systems currently have no communication capability to support greater visibility or coordination of devices. Around a million early DER systems do not have smart meters including an estimated 200,000 in South Australia where system security challenges are emerging associated with minimum load conditions.[11] Work is needed to ensure clear standards are in place, to support future customer choices to switch between DER service providers.
- Many consumers only have traditional accumulation meters rather than a smart meter (around 80% of small meters outside Victoria are still accumulation meters).[12] This limits services available, visibility of changing consumer behaviours for forecasting, and advice to consumers in selecting new services like solar PV. Seasonal variations in consumer use patterns mean that homes must have a smart meter for nearly 12 months before the data becomes valuable.
- Voltage data coming from smart meters could provide considerable benefits to the operation of the system but is unable to be leveraged due to regulatory and other barriers. Voltage measurement is currently not a mandated minimum standard service of a smart meter, though most smart meters being installed have that capability. However most smart meter data on voltage is not being used for a range of reasons and there are even DNSPs installing separate voltage meters to obtain similar data from a much smaller sample of customers.

3.2 Greater data is critical in a future market

The future system needs to coordinate more complex and variable technologies across more diverse markets while still securely managing physical constraints. This is difficult to achieve without greater visibility across the market and more active, responsive systems, creating significant cost risks.

Early action on data better equips the sector to manage these risks and optimise outcomes: through more-informed planning, empowering research on emerging challenges, visibility of change as it happens, and greater operational flexibility. This supports an informed, staged, and responsive approach to wider reforms, as market-driven change and technologies continue to emerge.

A secure and affordable future energy system depends on effective use of this data to balance a more complex, diverse, and variable energy system, through:

- informed consumer choice and personalised advice across more competitive, innovative, complex, and tailored services, reducing consumer bills and costs. (e.g., bundling services like EV and batteries across multiple providers).
- safe integration of new technologies and optimisation of their benefits, both through research and operational processes.
- enhanced visibility of resources to networks and the system operator, helping to balance diverse two-way markets while maintaining reliable supply and efficient prices.

[11] In South Australia there are around 300,000 homes with rooftop solar PV but only around 105,000 homes with smart meters.

[12] AEMO internal metering statistics.

- enhanced monitoring and visibility of the energy contracting behaviour of wholesale market participants, which can have impacts on price, energy dispatch and reliability.[13]
- better forecasting and planning activities in an environment with increasing two-way flows, variable output resources, and new technologies and configurations of supply and demand flows on the grid.
- better management of dynamic local networks and extreme events (e.g., to support understanding of hosting capacities and constraints, development of minimum demand measures, and dynamic operating envelopes).
- efficient planning of significant upgrades to network and distribution infrastructure, resource adequacy and essential services, around rapid change, minimising risks to affordability.
- fit for purpose consumer protections and equity, in the face of increasingly sophisticated services. Transparency can allow for light-handed but responsive regulation of emerging new services, while not limiting innovation through prescriptive requirements.
- data to support greater visibility of real-time behaviours at different levels of the network, and compliance of DER systems with market commitments (noting transparency of DER and the low voltage network remain as the largest data gaps in the system).
- up-to-date technical and communications standards which consider interoperability, to support competition and innovation.
- cyber security requirements, to protect against attempts by sophisticated but ill-intentioned actors to exploit NEM systems.

In the medium term, particularly with the continued uptake of DER, there is a need for proactive governance - clearer principles and frameworks around data rights and management to guide consistency in new approaches to resolve emerging issues. For example, clear frameworks are needed to guide new activities and responsibilities for traders and distribution networks relating to operation of dynamic operating envelopes, and clear standards need to be in place to enable customers to easily switch between or elect multiple DER service providers.

Digitalisation also creates new challenges and risks to manage. Current systems do not deliver the scale of data needs to support future markets with significant integration of DER products and services. Future systems need to be capable of supporting more complex settlement and data transfers between parties, as well as visibility and scheduling of a much larger number of (smaller) resources on the system to maintain system security. This requires a significant uplift in computational capability. Reforms underway are already driving system upgrades across the sector (for AEMO and market participants). A coordinated approach to how planning and sequencing future IT system needs can create major efficiencies.[14]

3.3 Economy-wide digitalisation

Economy-wide digitalisation is a source of much innovation and new opportunities for energy, supporting not only new technologies and data science but also more active and savvy consumers. It has also driven national data reforms, creating useful policy precedents but also new obligations and potential inconsistencies with existing energy frameworks.

13 Implementation of the ACCC's retail electricity price investigation (REPI) Recommendation 41 will provide crucial visibility of the wholesale contracts market for electricity and gas from a pricing and reliability perspective.

14 AEMO is developing a NEM IT Systems Roadmap as part of Post-2025 reforms

Digitalisation across service sectors fuels consumer expectations for more tailored and responsive services, as well as greater transparency in how their data is used and protected. This is driving international and national reviews of consumer data policy, including the Consumer Data Right (CDR) and privacy reforms, which create direct obligations of energy participants.

It also creates expectations that governments will use data more effectively to improve government outcomes, leading to reforms such as the *Data Availability and Transparency (DAT) Bill*. The DAT Bill will apply to Commonwealth bodies with energy responsibilities.[15] However, this does not solve problems in energy data sharing, as the change does not apply to other major data holders – Australian Energy Market Operator (AEMO), the Australian Energy Market Commission (AEMC) or jurisdictional policy and regulatory bodies.

Digitalisation also creates new risks to manage, with new cyber security and related critical infrastructure requirements, at both national and jurisdictional levels. These risks must be managed consistently across the economy including the energy sector.

3.4 A coordinated approach is needed

Despite ongoing effort across the sector in developing new digital capabilities, current governance of energy data struggles to resolve underlying issues. Problems are split across diverse owners and multiple frameworks with different decision makers. A coordinated response is required for timely resolution.

Wide-spread effort across the energy sector to improve data capabilities is driving much progress. In most cases these reforms fit within the mandate of a key agency but may still require long processes and significant costs to gain momentum and support. Examples include: the DER Register, 5-minute settlement (5MS), global settlement, expansions of AER's Energy Made Easy and AEMO's new real-time simulator tools, the Electricity Sector Climate Information Project, and the National Energy Analytics Research program. Responsibilities for implementing these reforms rests with the relevant market body but their success depends on growing the capability of the sector. Streamlining how this is done, rather than driving new capabilities as needed for each reform, minimises the costs associated with growing these new capabilities.

At the same time, areas without a clear lead that require collaboration or innovation, can make slower progress on critical reforms given multiple frameworks and gaps in access to data.

DER technical standards

For example, the DEIP program, facilitated by ARENA has worked hard to bring together a diverse range of stakeholders to consider key issues associated with DER integration. However, some issues continue to make slow progress, including for example, the development of interoperability and communications standards for DER devices.

The AEMC is currently considering a rule change to introduce new Technical Standards Governance arrangements, as part of the Post-2025 reforms. However, given the slow progress on issues over a period where uptake of devices has continued to ramp up, any future market is burdened with many passive DER systems, un-reported batteries and potentially passive EV chargers, creating more pressure on active elements to manage. Creating standards in this environment is challenging, given the need to address a 'status quo' that has evolved in the absence of the right data capabilities. The absence of clear standards

15 This includes the Australian Energy Regulator (AER), Australian Competition and Consumer Commission (ACCC), Department of Industry, Science, Energy and Resources (DISER), the Clean Energy Regulator (CER), Australian Renewable Energy Agency (ARENA), Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Australian Bureau of Statistics (ABS).

also creates opportunities for incumbents or first movers to limit competition. While this might also support innovation, these risks should be considered.

Agencies also struggle to streamline their data activities or meet new needs

Aligning agencies activities can be challenging when requirements are often set by different frameworks and decision makers. Industry participants naturally resist many new data needs and investment in supporting systems. There can also be apparent conflicts between reforms that benefit industry participants or consumers. Additional data requirements are often perceived as additional regulatory burden – where in fact smarter automation and sharing of reporting needs across market bodies can reduce the burden of *ad hoc* and duplicative data gathering. This can also have the benefit of increasing regulatory innovation, with greater transparency allowing light-handed approaches to replace more restrictive and blunt constraints.

Retail markets and retail monitoring

The transition to a power system with a high proportion of variable renewable energy and a network with a high proportion of distributed resources, there will be many opportunities for the development of new products and services to customers. The opportunities to meet those needs continues to expand through digitalisation. In this environment, potential suppliers need access to data to support these services, as well as to develop innovative new services and assess their likely value to customers.

In such an evolving retail market, with more sophisticated products and services likely to emerge, it will be important for regulators to be able to assess emerging risks and ensure consumer protections remain fit for purpose. Policy makers need to be able to measure the take-up and impacts of various service offerings to ensure the market design remains efficient.

Most jurisdictional regulators, AER, AEMC and now the ACCC all play some role in retail monitoring. The ACCC Retail Electricity Pricing Inquiry (REPI) pointed to clear duplication of reporting in this area. There is also a challenge with the right data being available, with consumer advocates seeking to close gaps, developing their own processes such as the St Vincent's Tariff Tracker and ECA's survey processes. However, efforts between agencies to streamline activities related to the same task have been challenged by restrictions in regulatory frameworks over what data they can share between them and limited capacity to propose major changes to their own roles.

There are also material risks for consumers to the extent that regulators, for example the AER, do not have the power to acquire information that would enable them to analyse and advise policy makers on levels of retail margins within the sector based on real data. Having the ability to collect information on what consumers pay for energy would also enable a more accurate and nuanced picture of energy affordability to come to light, enabling better targeting of policies to support customers experiencing vulnerability.

Frequently data challenges are not resolved because decision makers are unaware there are potential solutions. Rapid growth in data capabilities and analytics means that there are often innovative ways to solve problems which no one has considered before.

Current approaches to managing emerging data needs are not fit-for-purpose in a modern market. Improvements are needed in how energy data is managed and used across the sector, supported by regulatory reforms, greater coordination, and investment in capability.

4. The Data Strategy

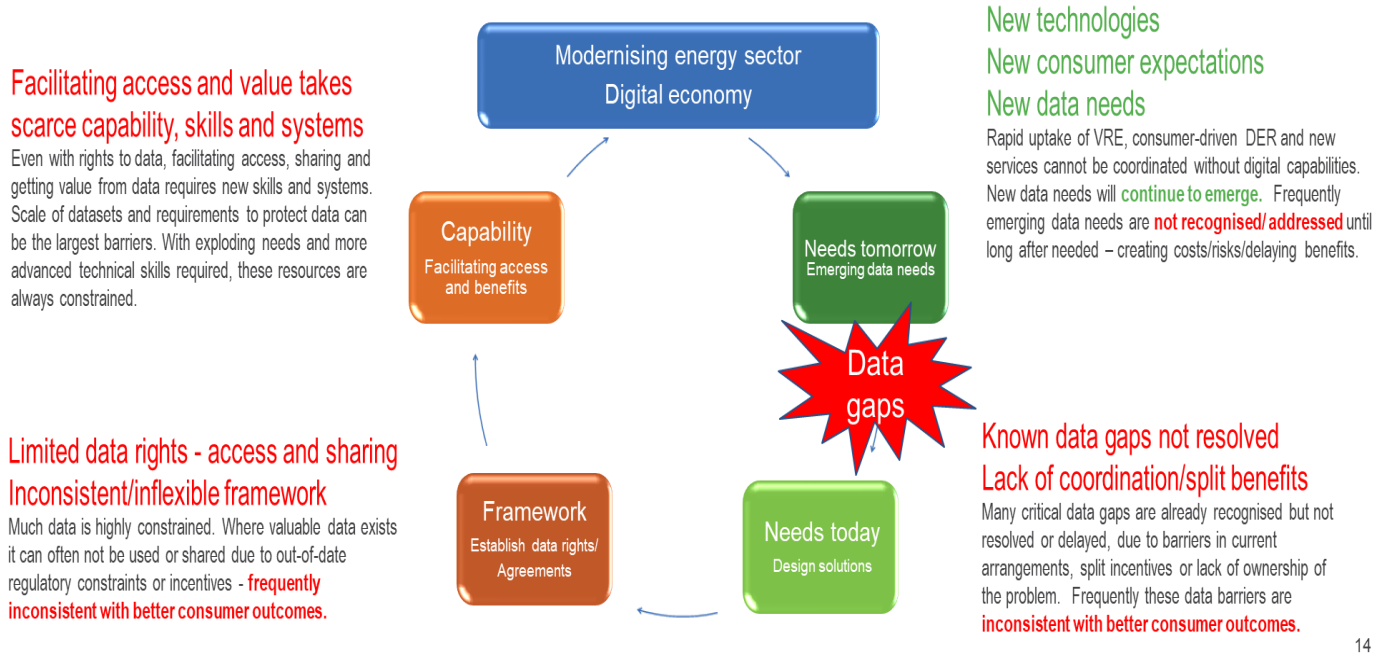
To address the data needs for the NEM, the ESB has developed the Data Strategy. The objective of the data strategy is to:

- *Manage changing data needs in the energy transition, and*
- *Optimise the long-term interests of energy consumers in a digitalised economy.*

4.1 Approach

The Data Strategy recognises that ongoing change in energy consumers, technologies and the system will continue to drive new data needs. The Strategy needs an ongoing and iterative approach to build data capabilities over time and respond proactively to changing data needs in the market.

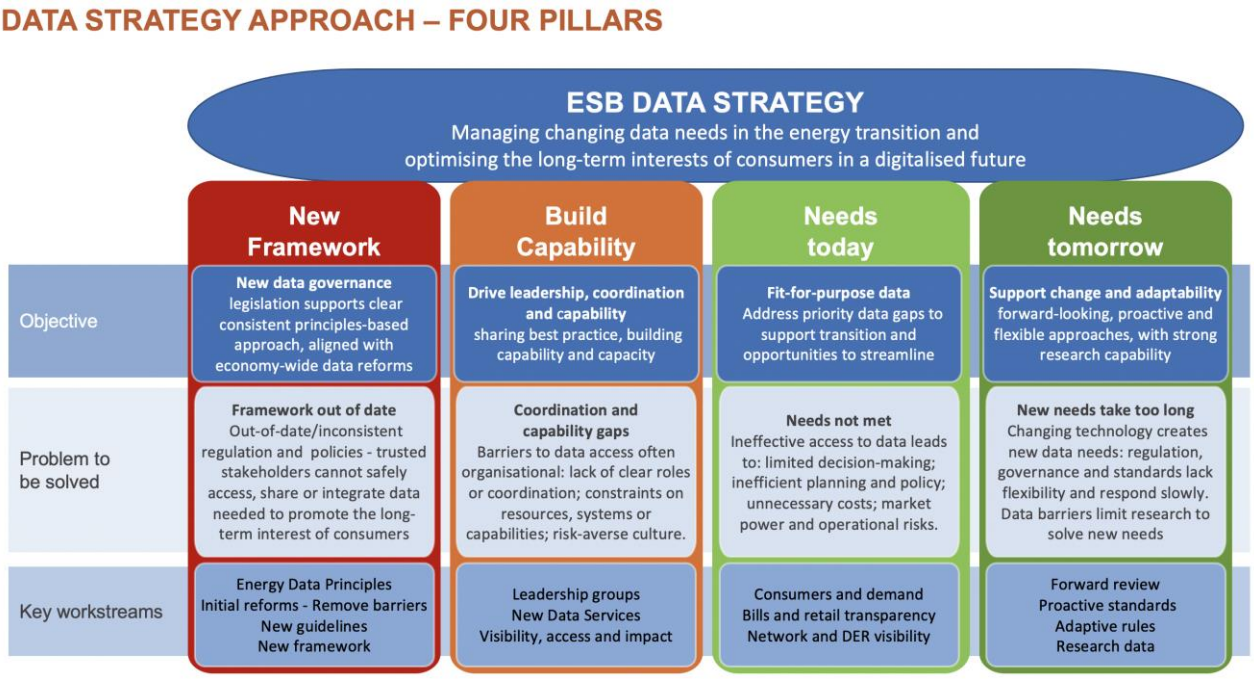
Figure 1 Addressing current energy data challenges



The Data Strategy addresses these concerns through its four key pillars:

- **New Framework:** Introducing new guiding principles and regulatory reforms, to remove existing barriers to better consumer outcomes, support safer data management and ensure frameworks are fit-for-purpose in a future energy market.
- **Capability building:** Building leadership, coordination and capability across agencies and stakeholders, to better manage data growth, grow value from analytics and support the data services the market needs.
- **Priority data gaps:** Filling gaps in current data sets, critical to support the *Needs Today* of better planning, evolving services and robust consumer protections.
- **Forward planning and adaptability:** Introduce regular proactive review and planning to meet *Needs Tomorrow*, timely standards, flexibility in data arrangements, and facilitating early needs for research and innovation.

Figure 2 Structure of the Data Strategy



4.2 New Data Framework

The ESB commissioned work to review current regulatory frameworks for energy data,[16] identifying a range of barriers limiting effective management and use of data, often in conflict with the wider interests of consumers.

Key issues identified included:

- Complexity leading to uncertainty
- An unworkable public interest test
- Constraints in the way privacy and commercial sensitivities are being managed.

There are wide-spread examples where these barriers have led to costly outcomes, contributing to planning inefficiencies, delays in critical projects and duplication of costs. Recent examples can be seen in relation to the AER Bill Benchmarking survey, which involves gathering meter data from across 17 network businesses with varied data outputs. In undertaking its most recent survey, AER requested data instead from AEMO, as a growing single set of meter data with more established data sharing with AER. However, requirements still led to extended negotiations and resulted in constraints in how the data could be used, which may limit previous uses of the survey findings.

Often these barriers were put in place for a sensible reason at the time, for example a conservative consumer protection or to limit regulatory burden. But changing needs and emerging inconsistencies between different frameworks mean these arrangements can now directly conflict with consumer interests. As data sets continue to grow in scale and in value for planning and research, these barriers are becoming more costly to consumers. Barriers also increase risks associated with limited data visibility,

16 The review was undertaken by a legal team across the market bodies and Commonwealth working with King & Wood Mallesons (KWM) and Galexia. Frameworks included in the review cover energy laws and Rules, as well as different jurisdictional requirements, and Commonwealth requirements such as privacy and consumer law.

misaligned standards or protection settings as the market adapts to new technologies. Stakeholder feedback also broadly recognised and supported the need for data regulation reforms, with frequent acknowledgment of wide-spread barriers.

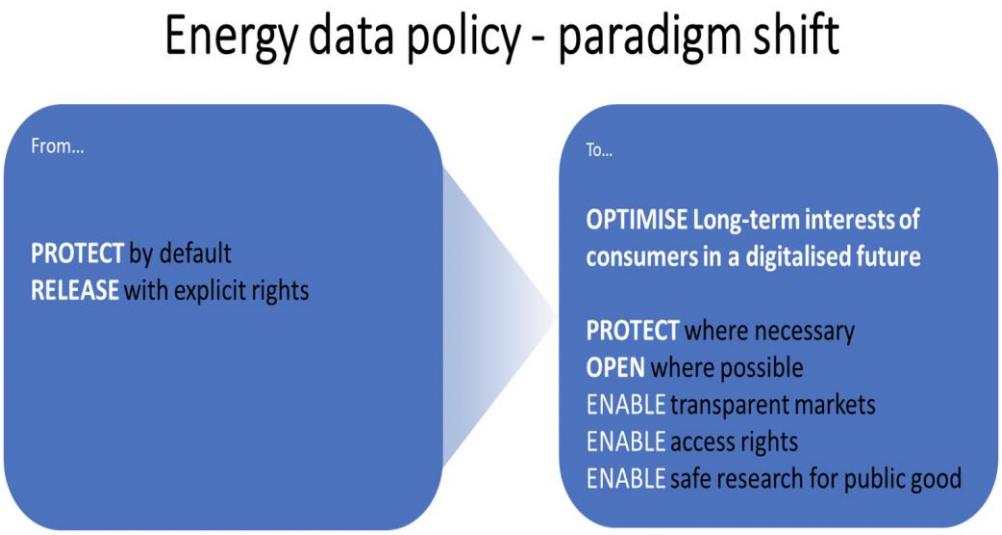
Digitalisation across the economy is changing consumer expectations about how their data is protected, accessed and used, and in the transparency required of governments and business. This is driving national data reforms such as:

- Open Data
- the Consumer Data Right
- Data Availability and Transparency Bill

These reforms create new high-level data policy precedents. They also create new obligations on a range of energy sector parties, contributing to inconsistencies with existing energy arrangements. This reinforces the need to review and update existing energy arrangements to reflect a modern approach to a data.

Based on these findings and cases studies of best practice and national reforms, the ESB proposes a new framework to optimise energy data management in the long-term interest of consumers. This requires a paradigm shift - from a regime which prohibits all data disclosure by default, to one which authorises protected data sharing where there are safe controls and clear benefits for all Australians.

Figure 3 Energy data – paradigm shift



To drive this, the ESB recommends Ministers agree new high level energy data policy principles, designed to guide all data-related reforms, including new national frameworks governing management and use of data:

Energy data principles:

Frameworks governing management and use of data across the energy sector should:

1. Drive outcomes consistent with the energy market objectives and the **long-term interest of consumers**
2. Ensure appropriate **privacy and security** safeguards are maintained
3. **Capture benefits** of a transparent, innovative, and informed digitalised energy market
4. Be fit-for-purpose, **flexible** and **cost-effective** for a digitalised market
5. Be coherent with wider **national reforms** on data

The ESB will work with data experts and stakeholders to design a new regulatory framework for energy data supporting these principles, aligned with wider national data reforms and fit-for-purpose in a digitalised future. This design process should begin immediately, however, as a major structural reform will require time to engage and align stakeholders. This process should also engage with ongoing development of national reforms.

The energy data framework should:

- Reflect new energy data principles
- Define clear criteria for assessing which data can and cannot be shared
- Define clear requirements for safe sharing and management of data, reflecting privacy and security concerns
- Define flexible governance arrangements to support these decisions, adaptable to changing needs over time
- Align with the policy directions of national reforms such as the Data Availability and Transparency reforms, the Data Sharing Principles, the Consumer Data Right, and relevant privacy reforms and cyber security requirements.

Initial regulatory reforms

In the interim, the review also identified some initial reforms that could be taken within the existing framework to address some immediate barriers to using existing data for better planning and policy development. Timely implementation of these reforms is particularly important in unlocking the use of existing data for planning and technology trials to support the energy market transition and the Post-2025 market design. As part of the strategy the ESB intends to work with officials to develop the legislative changes to support effective planning and research in the market transition. Regulatory changes address:

- Improving access to existing data and analytics for key trusted policy and research bodies.
- Clarifying roles of key market bodies to support effective data services in the market and removing related inconsistencies and barriers, including:

- expanding AER's powers and monitoring capabilities for wholesale markets, as proposed by the ACCC and agreed by Ministers, to ensure more effective markets and consumer protections;[17] and
- ensuring AEMO can support growing needs for safe data services and analytics in the market.

Common guidelines

Given that many regulatory barriers identified are due to uncertainty and inconsistency in the current framework, the review also recommends the introduction of common guidelines for data sharing and collection between regulators, market bodies and policy makers as an immediate measure to reduce some of these risks. The ESB proposes to develop these Guidelines, working with legal experts and stakeholders for endorsement by Ministers. Regulatory changes are needed to oblige compliance with the guidelines. The guidelines would highlight common pitfalls which cause costly delays and constraints and provide best practice guidance to support a range of needs, such as requirements for data collection in government programs and publicly funded trials (including consent requirements); and sharing of data sets in industry-research partnerships.

Consumer Data Right

Data needs of consumers are central to the Data Strategy and its focus on enhancing consumer outcomes. With growing complexity in services, consumers need to be better informed in seeking the best services for their needs, with access to their own data and services to provide personalised advice. To support this, the Commonwealth is implementing the Consumer Data Right (CDR), which is to operate across multiple sectors, including energy. Energy agencies and officials are actively engaging with the development of the CDR. Wider regulatory reforms considered as a part of the Data Strategy are cognisant of the ongoing development of the CDR.

4.3 Capability building

With the current pace of change, all market bodies and participants are active in building new digital capabilities, with widespread investment in updating systems. However, major gaps and duplication remain, where bodies cannot share or collaborate over data sets, or where there is no clear owner to resolve a new data set or standard in a timely way. Examples include:

- agencies in most jurisdictions and several national bodies separately request retail data and undertake similar consumer surveys (with the resulting administrative costs and overheads on all parties),
- minimum inverter standards remain ill-defined (despite close to 3 million homes with solar PV in the NEM),
- there is no clear lead agency to collaborate with the transport sector on electric vehicle data needs and access.

The ESB notes that a key element in managing growing complexity in energy data needs and capturing related benefits is leadership for ongoing development of new capabilities and better coordination and collaboration across many parties. Current arrangements have led to inefficient approaches, with frequent

[17] See ACCC REPI report, Recommendation 41

inconsistency, duplication, and fragmentation in data sets across energy and policy agencies. To support this, the ESB proposes to put in place the three following steps:

Data Leadership and Coordination Group (DataLAC)

- DataLAC will be a non-statutory body made up of representatives from market bodies, coordinated by ESB
- DataLAC will play an ongoing role in meeting new data needs, growing capabilities and improving collaboration. The DataLAC will coordinate implementation of the Data Strategy and related reforms in an iterative manner, responding to changing needs and reforms across the sector.
- This will include regular forward review of changing data needs and regular reports on progress to the ESB and Energy Ministers.

Data Reference Group

- The DataLAC will work closely with an ongoing Data Reference Group, with a wide range of data experts and stakeholders. This group is to build expertise and collaboration from across the sector and provide input on evolving needs, priorities, and opportunities. This will be in-addition to standard public consultation on reforms.

New data services and analytics

- Growing data sets have limited benefit if they are not able to be used effectively to improve services, planning, and innovation. Large-scale data sets require advanced skills, high-powered systems and clear processes to navigate, manage and protect them.
- New data services and capabilities are needed to support safe and efficient access to data and advanced analytics for research and policy, as well as more timely and useful metrics and reporting.
- Market bodies must be better equipped to play an important role in these new data services, as they increasingly hold and protect key data sets of great national value to better research, planning, and consumer outcomes. These are new capabilities market bodies will need to develop
- To maximise this value, data services need to be effectively resourced with governance arrangements to respond to a wide range of stakeholder needs to empower expertise across the sector. The ESB proposes that models for resourcing be developed. These could vary across a range of service needs and stakeholders.

Stakeholder submissions broadly supported the concept of a Data Leadership and Coordination group and a Data Reference Group,[18] recognising the need for coordination to drive data reforms and raising a need for strong industry representation. There were a wide range of views on the structure and representation on the group, largely representing a desire from most stakeholders to be directly involved. A few submissions suggested stakeholder engagement be streamlined across a range of processes.

4.4 Priority data gaps

In developing the strategy, the ESB reviewed and identified existing data gaps. The review also considered where existing processes or a clear ownership of the problem, particularly by a market or policy body, could address the gap.

[18] In the consultation paper this was referred to as the Data Users Group.

From this review, three clear priority areas were identified to be addressed by the Data Strategy. These data gaps represent key risks in the energy transition and do not have a clear path to resolution without coordinated intervention. Priority areas include:

- Understanding consumers and demand
- Bills and retail market transparency
- Network and DER visibility (including Electric Vehicles)

The Data Strategy must be ongoing and iterative, regularly reviewing progress and setting new priorities to resolve. DataLAC will include consideration of progress on these wider issues as part of this review process.

These priority risks are discussed below. Further details of initiatives to address each of these are outlined in the Appendix.

Understanding consumers and demand

Consumers' choices in technologies and services are driving a large part of the change in the energy sector. However, as with most popular consumer trends and politics, these changes have repeatedly proven difficult to predict. Examples include:

- Uptake of new technologies, with forecasts broad and frequently well off the mark, creating key risks for investment and planning.
- Behavioural evidence of how consumers respond to different incentives (such as prices) is limited without bill data of what customers are paying but is central to designing effective measures.

These trends highlight particular gaps in consumer data:

- uptake of new technologies – particularly batteries and EVs,
- gas access and usage,
- identification of vulnerable groups and different drivers of vulnerability,
- identification of different business activities and sectors,
- building characteristics such as size and efficiency factors.

Linking these factors to meter data, particularly smart meter data, where behavioural impacts can be observed, is key to understanding demand and the above gaps. Using data held outside of the electricity sector could assist, such as gas, transport, building, other utilities, and business registration. These external data sets can be more fragmented than energy data, making coordination complex, such as diverse jurisdictional vehicle registration processes or local government zones.

The current gaps result in wide-spread activities in consumer research but fragmented outcomes, with limited data sharing or ability to link or compare data sets, lack of timely data and few ongoing metrics. There are existing consumer research processes which are duplicative or out-of-date, that could be better coordinated to improve data sharing, usefulness and timeliness of the data.

Building greater ongoing capacity to observe and understand changes in community needs and behaviours, will be central for policy makers to deliver improved outcomes for consumers.

The ESB considers that developing more robust consumer data sets, targeting both forecasting and policy metrics, remains a priority to manage future risks to consumers. DataLAC will progress work on meter-data access and updating consumer research processes as priority activities.

Bill Transparency and Retail Markets

With growing complexity and innovation in services, it is increasingly important to understand what drives consumer behaviour, what they pay for energy and how different services impact bills and choice.

However, there is currently no substantive data set allowing for analysis of bills or retail arrangements and how different factors affect them. The ACCC REPI review confirmed that our understanding of how changes impact consumer behaviour (and their bills) is poor. The introduction of the Default Market Offer (DMO), the impact of COVID on customer energy usage and of solar PV on customer bills have all highlighted gaps in understanding of customer behaviour. This can limit the effectiveness of consumer protections and constrains effective policy responses.

Data and information about the performance of energy companies is also critical tool for regulators and consumer protection agencies. Going forward, we may see innovative new energy products and services, or business models that differ to those covered by established regulatory service definitions and precedent. Work will need to be done to ensure these are properly regulated (under the NECF and/or the ACL) so they can be safely permitted, without causing consumer detriment.

Emerging new services in the future NEM will mean it is increasingly important to be able to observe how consumers are impacted by change and respond to new risks with fit for purpose consumer protections. Given the pace of change occurring in retail markets, it will be important that market bodies and regulators have the ability to monitor the changes in the market, the conduct of traders and consumer outcomes. This allows identification of potential or actual detriment early, and quick action to stamp out poor or illegal conduct to protect customers before it becomes systemic.

Where these risks cannot be properly understood or monitored, this may result in regulatory over-reach which limits innovation. Addressing data gaps assists in assessing emerging risks associated with new and more sophisticated retail products, ensuring appropriate protections remain in place for consumers. These risks will be assessed in an ongoing and iterative basis by market bodies through use of the new Consumer Risk Assessment Tool developed as part of the Post-2025 reforms.

As new technologies become automated and more active in their response capabilities, consumers have opportunities to become more responsive to market signals. Visibility of these automated signals may become critical in predicting and securely managing DER behaviour.

The ACCC REPI raised concerns which have not been resolved:

- that price reporting remains ineffective, duplicative, and costly, with many agencies requesting data from retailers but still no clear information on what consumers pay.
- greater transparency in the retail and financial markets (i.e., wholesale contract markets) was needed to support efficient competition, with risks to affordability and market power observed.
- limited transparency of conditions in medium scale commercial supply contracts means the effectiveness of competition in this sector is unclear, or the impact of recent price shifts and service innovations. The Strategic Energy Plan[19] also highlights the need for new metrics in this area but this has yet to be fulfilled.

Related to the work to be done for this priority gap, the ESB:

- proposes that these issues be resolved with new requirements for transparency in consumer bills and retail arrangements, and those for medium scale commercial businesses. Design of these options should consider streamlining benefits to reduce duplication of reporting and allowing for shared access across agencies with related responsibilities.

[19] The Strategic Energy Plan can be found here: https://energyministers.gov.au/publications/strategic-energy-plan

- recognises that transparency in wholesale and financial markets is a priority and supports Energy Minister's commitment to expand AER's powers and monitoring roles, as recommended by the ACCC (REPI recommendation 41).

Network and DER visibility

Data is central to the effective integration of DER into the low voltage network. New digital capabilities are critical to support planning and optimisation of local networks and enable customer response from flexible demand and DER assets. Currently, there is limited ability to communicate with DER and monitor performance in the low-voltage network. This limits the effective integration of these resources and, at current rapid rates of uptake, challenges system security.

Reform priorities to address these issues are being progressed via the Post-2025 DER Implementation Plan, including as part of the development of dynamic operating envelopes (DOEs). Greater network transparency will support consumer investment decisions and the DOE will become the operational tool to implement constraints in the network. The Data Strategy creates the data management capability foundations to support this work over time.

For example, as data requirements for new roles and responsibilities are developed, the Data Strategy's data principles and new regulatory framework support development of coherent requirements for how relevant data sets related to this issue are used and managed. Coordination provided by the new framework, also ensures consistency and alignment of these activities with wider reforms like CDR and the Distributed Energy Integration Program (DEIP).

Data in relation to DER uptake and integration would also assist the AER in evaluating expenditure proposals from distribution network businesses, providing a foundation for decisions that deliver efficient capital and operating expenditure allowances.

In addition to this ongoing work, the following activities are identified as actions for initial reforms identified as part of the Data Strategy.

Network transparency

- A key component of the Post-2025 reforms is to support effective integration of active DER, with consumers (through their retailer/aggregator) offering services to the wholesale market as well as to networks to help manage local issues including constraints and congestion. To support this integration, stakeholders outside of network businesses need access to network information. This includes DER investors or service providers, or providers of network support services. Improved access to data could better enable markets to support business cases for efficient DER investment, reduce risks of constraints, target network support services and create capability for greater market participation of flexible demand and DER.
- The ESB propose that monopoly network providers should be required to support greater transparency in local network performance and hosting capacity, emerging constraints, and voltage issues with the market. The form of this obligation needs to be considered carefully, particularly vulnerable consumers.
- The ESB propose that the AER lead a process, reviewing existing network data and network visibility requirement to develop pathway to network transparency.

Over-voltage

- To date, lack of investment in network data still limits transparency. Understanding what 'cost-effective' investment in network visibility is problematic, due to lack of data on the potential cost impacts of current voltage levels. Recent work on DER integration has demonstrated that, in many

areas of the network, voltage levels already vary within, and beyond, the prescribed range.[20] Where significant, this can cause damage to consumer equipment, for example reducing the life of some home appliances and electronics and may increase energy losses across the network. Research into the impact of these excursions on modern appliances is incomplete, however, given the considerable investment by consumers in electrical equipment across Australia, these factors could materially influence the economics of investment in network monitoring and data.

- Jurisdictional regulators have responsibility for monitoring voltage concerns, and the AER considers proposed business cases for network investment, including monitoring systems. This creates split decision making and monitoring roles that makes the development of regulatory solutions difficult.
- The ESB propose that the AER and jurisdictional regulators coordinate work to estimate the benefits of more active voltage monitoring and management such that the potential benefits and costs can be aligned across decision makers.

Metering

- Metering provides a potentially vital data source to increase the visibility of network loading. A range of opportunities have been identified for metering data to be better leveraged for retailers, customers, and networks. This is being considered in the AEMC's current review of the Regulatory Framework for Metering Services.[21]
- The ESB propose that this work should inform the development of future reforms to be identified as part of forward planning.

Network data capability

- There is a considerable amount of work to be done developing data tools and related capacity and skills within network businesses and across the wider industry. Collaborative work is underway internal to network businesses and through collaborative processes like DEIP.
- The ESB propose that progress over time be monitored and further reform to accelerate capacity development be considered as part of forward planning.

Electric vehicles

- Visibility of existing and potential DER capacity remains an issue, with wide variations in forward estimates of growth. The recently implemented DER Register [22] is improving coverage of roof-top solar capacity and batteries, and AEMO is continuing to develop these capabilities. The visibility of new forms of DER, such as flexible demand from local appliance control, electric vehicles and related charging equipment is currently insufficient.
- The ESB supports recent additional work identified by the DEIP Electric Vehicle Data Availability Taskforce.

[20] Work is being carried out as part of the DEIP program. The DEIP is a collaboration of government agencies, market authorities, industry and consumer associations aimed at maximising the value of customers' DER for all energy users. Further information on DEIP can be found here: https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/

[21] Further details can be found here: https://www.aemc.gov.au/market-reviews-advice/review-regulatory-framework-metering-services

[22] AEMO's DER Register is a database of information about DER devices installed across Australia at residential or business locations. The DER Register can be found here: https://aemo.com.au/en/energy-systems/electricity/der-register

4.5 Forward planning

Data-related reforms and requirements will need to be adaptable and forward looking. The Data Strategy is designed to be an ongoing framework with iterative processes, responsive to changing needs. As the NEM evolves, it will create new requirements for data and revised roles and functions in data. The Data Strategy needs to be able to respond to these needs.

Adaptability

Frequently consumers bear costs when development of data requirements or related standards are delayed, often through lack of clarity over ownership of the problem or under-resourced collaboration processes. Targeted reforms can also address direct data concerns without addressing consistency with wider frameworks, contributing to uncertainty and higher data costs over time.

The ESB propose that the DataLAC and Data Reference Group will undertake regular forward reviews of changing data needs and provide proactive advice to Energy Ministers and market bodies on action needed to address them, consistent with the energy data principles identified above. The forward review will include:

- **Identification of issues and progress with relevant technical standards.** Delay in resolution of standards, particularly standards for data, communication, and interoperability, is a handbrake on effective digitalisation and creates costs for consumers and the system. The AEMC is currently engaging with new governance arrangements for standards, seeking to address this and create timely and coordinated processes.
- **Consideration of how reform proposals provide flexibility and align with data principles.** The AEMC has recently considered appropriate needs for flexibility in forward drafting of Rules, through its new drafting philosophy.[23] This provides guidance on more flexible approaches and, when they are appropriate, to support adaptable Rules. Forward reviews will need to consider how reforms reflect the high-level data principles, align with wider data arrangements, and also reflect the AEMC's new drafting philosophy.

Research data

A key gap in a forward-looking market is effective data to inform research. An active research sector plays a critical role in how to integrate new technologies, facilitate innovation in services and plan and manage a future system. Yet valuable research resources are frequently under-utilised due to gaps or constraints in data.

A range of reforms across the Data Strategy seek to address this including:

- the new regulatory framework focused on more flexible access for public-good research;
- common guidelines on collecting and sharing data; and
- development of new data services to support data access.

Further action is also needed to address sharing and facilitation of high-value research-generated data:

- For example, trial data on VPPs and electric vehicles,
- Synthesised, granular low-voltage network data for modelling.

23 The AEMC Rule Draft Philosophy was published in October 2020. Further information can be found here: https://www.aemc.gov.au/sites/default/files/2020-10/Rule%20drafting%20philosophy%20guide%2020201008.pdf

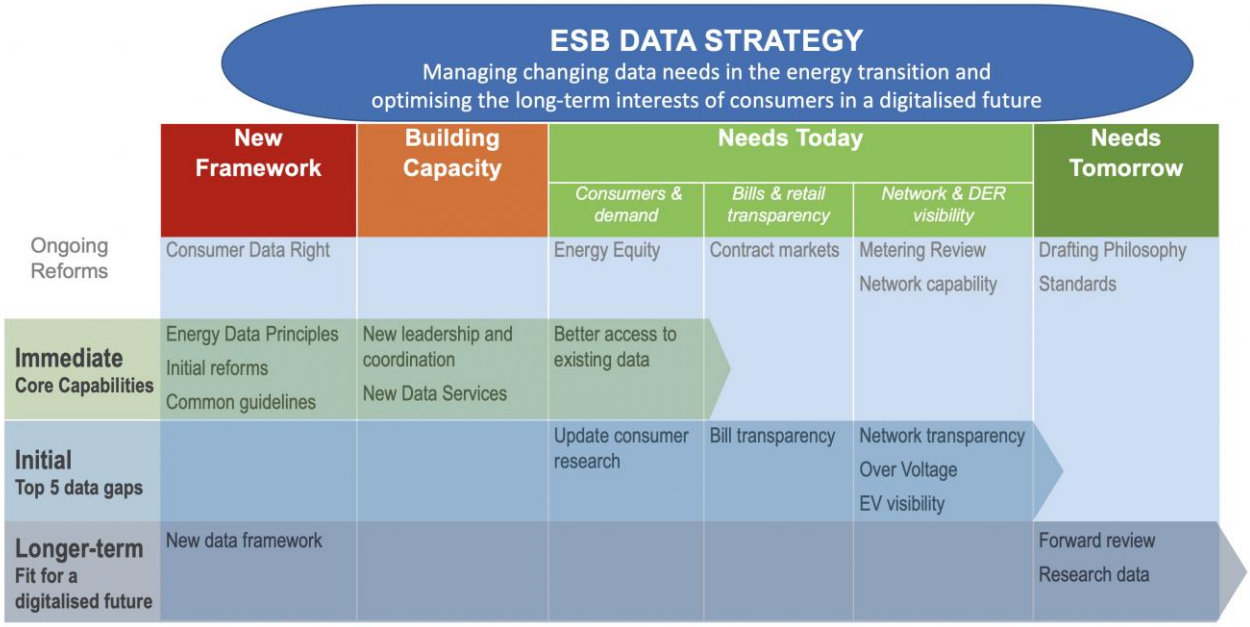
ESB propose the DataLAC and Data Reference Group will bring together a focus group of research-sector stakeholders to develop models to improve access to research data.

5. Implementation

The ESB recognise that data reforms must be *ongoing* as digitalisation and innovation continue to evolve data needs. To support this, implementation of the Data Strategy is based on a phased, iterative approach. Early phases will set the direction, governance, and processes to support ongoing change, and later phases supporting an iterative, proactive review process.

Many urgent needs identified by the Data Strategy already have related work underway (such as the CDR and AEMC Metering Review). Implementation of the data strategy will align with related reforms on foot.

Figure 4 Implementing the Data Strategy

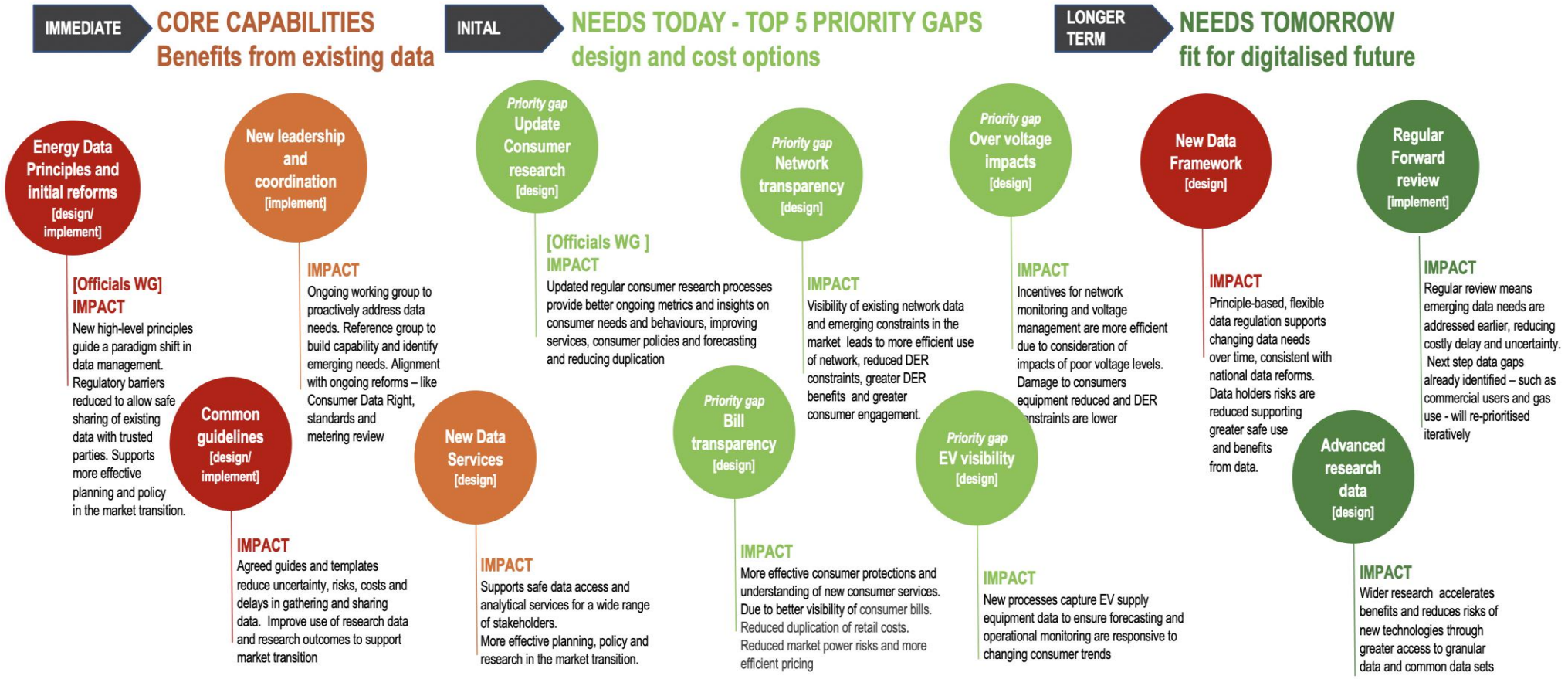


Consistent with the Post-2025 reforms, implementation of the Data Strategy is set out over three phases:

1. **Immediate**
   - Sets energy data directions and core capabilities to drive the Strategy over time
   - Addresses initial barriers to unlock immediate benefits from existing data sets, improving data sharing and analytics to support policy and planning for the future NEM.
2. **Initial**
   - Identifies the top five data gaps and designs options to resolve them, focusing resources and seeking near-term impact.
3. **Longer-term**
   - Focuses beyond immediate concerns to prepare for digitalised future
   - Set in place ongoing forward reviews to ensure a proactive, responsive approach to changing data needs.

Figure 5 below illustrates recommended reforms and activities across each of these phases, over the first 1-2 years. More detail is set out in the Appendix.

Figure 5 Data Strategy – Implementation Workstreams



DER & related services

- ✓ Reduced, more transparent constraints – higher penetration
- ✓ New public data – networks
- • New reporting requirements
- ✓ New Data Services and research partnerships
- ✓ Common guidelines for data collection and sharing

Retailers

- • New reporting requirements/streamlining of existing requirements
- ✓ New public data – networks
- ✓ New Data Services and research partnerships
- ✓ Common guidelines for data collection and sharing

Networks

- • New network visibility / reporting requirements
- ✓ New monitoring incentives – greater clarity for business cases
- ✓ New DER/EVs visibility
- ✓ New Data Services and research partnerships
- ✓ Common guidelines for data collection and sharing

6. Appendix A – Implementation Plan – 2021-22

This appendix identifies measures proposed for the first 1-2 years of the Data Strategy, outlining their scope and benefits. These measures are set out as **immediate**, **initial** and **longer-term** priorities.

Immediate

- Sets high-level directions and core capabilities to drive the Strategy over time
- Addresses initial barriers to unlock immediate benefits from existing data sets, improving data sharing and analytics to support policy and planning for the future NEM.

Initial – Design and Cost

- Selects the top five data gaps and designs options to resolve them, focusing resources and seeking near-term impact.

Longer term - Design

- Focuses beyond immediate concerns to prepare for digitalised future
- Set in place ongoing forward reviews to ensure a proactive, responsive approach to changing data needs.

6.1 Immediate priorities

6.1.1 Energy Data Principles (New Framework)

New energy data principles to set the direction of the strategy and align design work on all data reforms

The Energy Data Principles guide design of all measures including initial reforms. Development of the *New framework* (discussed below) will consider further how to incorporate these principles into framework.

6.1.2 Data Leadership and Coordination group (DataLAC) (Capability Building)

Put in place an ongoing working group responsible for leadership and delivery of the Data Strategy, as well as building wider data leadership, coordination and capability across the sector.

DataLAC is proposed as a collaborative, non-statutory arrangement, working across market bodies with a funded secretariat, reporting through ESB to Ministers on progress in the Data Strategy and further implementation recommendations.

Terms of Reference include delivery of work streams, including facilitating the Data Reference Group and ongoing Forward Review processes, and providing ongoing recommendations to Ministers on priorities and resourcing needs. Its workload to deliver the Strategy over the first few years is significant, facilitating legal reforms, technical advice and stakeholder engagement, and will not be achieved without a dedicated secretariat. Its arrangements should be flexible to changing needs over time.

6.1.3 Data Reference Group (Capability)

DataLAC to put in place an expert reference group to provide ongoing advice on reforms and data needs across the sector and to create a collaborative environment which supports problem-solving and capability development through shared best practice.

This group will help access and build expertise across the sector, contribute to input on reforms and identify emerging needs. It will compliment, but not replace, usual open consultation processes as part of reforms in each workstream.

Membership of the group will be voluntary. The group will seek to include data expertise from all key stakeholder groups in the energy sectors and all jurisdictions. This group will provide advice to DataLAC, market bodies and Ministers. It is not an independent decision maker. Its arrangements should be flexible to changing governance needs over time.

6.1.4 Initial data reforms (New Framework)

DataLAC and officials to develop and implement initial legislative reforms to enable greater value from existing data for Energy Ministers to agree.

These are targeted regulatory changes to reduce barriers to appropriate sharing and use of existing data with trusted bodies, aimed at supporting clear consumer benefits through policy and planning. Implementing these measures in the near term supports planning and policy reforms in the transition to Post-2025 market reforms, including better forecasting and DER integration.

Specific law and rule changes, identified in the in the legal review of energy data frameworks,[24] include:

- supporting greater access to existing data for trusted 'prescribed agencies' (government bodies demonstrating sufficient protections in place), with appropriate agencies to be agreed by officials.
- removing inconsistencies in existing regulation of the market bodies, to clarify their roles in supporting appropriate data sharing.

These changes are related to those being developed to support the Consumer Data Right and could be implemented together.

These changes could enable analyses such as the following (all of which could be undertaken with full privacy protections):

- Jurisdictions/regulators to analyse impact of demand or DER changes in localised areas – for example: forecasting, planning, or researching co-factors like demographics or building codes.
- Jurisdictions/regulators linking meter data to program participants to analyse aggregate impacts of program – for example the impacts of VPP or DER trials, or targeted vulnerable customer program.
- AER/AEMC/ACCC to link to AEMO data more easily. For example, AER recently accessed AEMO meter data to support bill benchmarking survey (linked with consumer consent). Current arrangements can take months to negotiate and preclude AER being able to share de-identified data with other parties (as they have with previous versions).

24 https://energyministers.gov.au/sites/prod.energycouncil/files/publications/documents/ESB%20Data%20Strategy%20Preliminary%20legal%20report%20%2825%20August%202020%29.pdf

- Could support some forms of data sharing upon request – such as undertaken by Victorian Energy Compare.

With these reforms alone, these analyses would still be constrained by access to appropriate analytical skills and systems to manage large data sets in the trusted body, as well as capacity within AEMO to extract, aggregate, link and approve release of related data. Linked to New Data Services (discussed below), these changes could empower a wide array of planning and improved policy and programs.

6.1.5 Common guidelines (New Framework)

DataLAC to work with expert legal advisers to develop common guidelines and data sharing agreements to reduce uncertainty, cost and delays in data access and gathering.

DataLAC will appoint an expert legal team to lead the development of common guidelines and related templates, consulting with legal representatives from across stakeholders. This will include:

- Guidelines clarifying key data sharing constraints
- Templates for common data sharing agreement with key agencies and common industry-research partnerships
- Guidelines for common data gathering, such as agreed consent requirements in surveys and trials.

Development of Guidelines is intended to reduce current costs and risks in negotiating data access, due to diverse legal advice and long negotiation delays. Examples include:

- Many industry-research partnerships with public funding (such as ARENA projects) have been delayed in unexpected negotiations over data – often due to diverse/unexpected advice from different legal teams after projects are approved. Examples include VPP trials and dynamic operating envelope trials.
- Many publicly funded trials where data-gathering was a key objective have struggled to share data due to lack of clarity in consent acquired from participants. This can significantly limit the outcomes and benefits of the program. This has impacted major programs targeting data to support improved outcomes in DER integration and vulnerable consumers. Examples include Smart Grid-Smart City and trials within the Low-Income Energy Efficiency Programs.
- Other examples include publicly funded surveys where data was intended to be a widely-shared policy input. However, due to lack of appropriate consents, the projects are unable to share data (e.g., bill benchmarking surveys).

6.1.6 New data services (Capability Building)

DataLAC to design, cost and recommend a new Data Service model to enable greater access to existing data and value from innovative analytics capabilities.

DataLAC will work with agencies and technical advisors to develop organisational and funding models to support new data services and analytics. This aims to facilitate better access and use of protected data held by market bodies by a range of stakeholders.

Data services are envisaged to be broad, examples including:

- shared resources - such as dashboards, metrics or reports for multiple users or the public/market
- protected data linking (such as to analyse the impact of a program)
- facilitating sharing of protected data where appropriate
- data management and curation services – providing wider safe access to data from a range of sources

- tailored aggregated data sets on request
- advanced data analytics on request

Access constraints on the market bodies and protected data will shape the range of governance options. Ideally, data services will draw on dedicated specialist data science skills and will support a variety of funding models for different services, for example:

- market funding to support widely valued outputs;
- shared jurisdictional funding for widely valued policy data and shared outputs; and
- fee-for-service arrangements for tailored services.

Benefits

The 'right' to access data alone is rarely sufficient to increase its value and impact, as safely sharing or analysing large-scale data sets requires access to advanced skills and systems, as well as clear data curation, management, and approvals processes. These organisational barriers can limit and delay benefits. Data services can increase value from data by facilitating a range of different ways to access data safely and can resolve many barriers such as available skills and standard service arrangements.

Examples of where data services could usefully be developed include analysis of jurisdictional policies and programs. AEMO is often requested of by jurisdictions to assist in such activities (to enable meter data to be linked to measure impacts). This can be a highly valuable outputs for policy makers, but often face limitations in the absence of data services due to practicalities such as resourcing constraints, non-standard service agreements requiring (lengthy) legal negotiations, concerns regarding publication of analysis and lack of standard analytical methodologies like control groups.

6.2 Initial reforms

Initial reforms will include work to design and costs options to resolve the top five data gaps and provide recommendations. Given the breadth of data gaps identified, prioritisation is necessary to ensure progress.

The criteria applied in selection of priority data sets were:

1. Costs or risks if delayed, short-term impacts.
2. Value managing risks in or optimising the energy transition.
3. Whether intervention or coordination is necessary – could an existing body or process be tasked to resolve it.
4. Interdependencies, where links to ongoing processes impact optimal timing, or resolving data gaps in one area may support another.

Data gaps identified but not prioritised in this phase will be considered in the ongoing forward review. If they have not been progressed and remain a concern they will be prioritised in the next round of reforms.

6.2.1 Updating consumer research (Priority data gaps)

Design and costs options for an updated regular consumer research process. Address critical gaps in understanding changing consumer needs and behaviours, impacting effective demand forecasting, planning, consumer policy and protections, and improving services.

DataLAC will engage expert advice and coordinate with the Energy Ministers energy equity workstream to:

- Review the many existing consumer research processes – which are wide-spread across agencies and jurisdictions.
- Work with expert stakeholders to identify priorities in consumer metrics, to inform effective forecasting, vulnerable consumer policy and wider consumer protections.
- Propose an updated and streamlined approach to regular consumer research, defining clear scope, priorities, design criteria and delivery options to provide more relevant, comprehensive, timely and accessible consumer metrics.

This builds on work underway by officials through the Energy Equity working group which has recently reviewed data collection processes and proposed new metrics around vulnerable consumers key to its next phase of work. By coordinating with wider existing processes and wider ongoing consumer research needs, the energy equity workstream will gain stronger collective outcomes. This work is also timely in coordinating with ongoing work by the AER on their vulnerable customer strategy and reforms to billing guidelines which will impact Bill Benchmarking surveys.

This activity will define a coordinated ongoing research process with a clear purpose, scope, design criteria and ongoing management. It is not intended to restrict future surveys (whether wide or targeted in nature) but to provide a more coordinated and complete basis for ongoing consumers metrics, reducing current gaps and widely sharable to reduce duplication.

Benefits

- It is widely recognised that there remain large gaps in understanding consumers changing behaviours, despite a wide range of existing regular and *ad hoc* energy consumer research processes.
    - Existing surveys include AER bill benchmarking, ECA Consumer Sentiment survey, NEAR surveys, ABS surveys, jurisdictional surveys, programs specific research.
    - Existing processes are varied in scope, often difficult to share or compare, and not designed to support coherent ongoing metrics.
- This lack of visibility of consumer change and impacts results in serious challenges:
    - Forecasting demand and consumer-driven change – in aggregate and locally. It is critical to keep ahead of changing consumer trends in demand and uptake of new services, such as solar PV, batteries, and electric vehicles, as these trends have proven challenging to predict in the past with costly outcomes.
    - Tracking impacts on consumer outcomes over time – particularly in the face of rapid changes or new policies. For example, uptake of DER, DMO/VDO or COVID impacts. Investigating these matters currently leads to dedicated *ad hoc* surveys with limited context.
- There is little ability to target policy, analysis, or advice to different consumer segments - missing visibility of diversity.

6.2.2 Bill transparency (Priority data gaps)

Design and costs options for visibility of customers bill outcomes, providing jurisdictional regulators with the data they need with less duplication and burden on industry.

Address critical gaps in consumer protections as services become more complex, by allowing for better understanding of: how different consumer segments, including vulnerable consumers, are impacted by new technologies and services; how consumers and technologies are responding to market price signals; and effectiveness of competitive retail markets.

DataLAC to engage expert advice to:

- Identify and design options for reporting consumer bill outcomes, engaging closely with stakeholders
- Estimate relative costs and benefits of options – including streamlining opportunities across existing retail reporting and consumer research, and synergies with reforms such as the Consumer Data Right.
- Provide recommendations on implementation.

This aims to:

- resolve current duplication of retail reporting arrangements, which is costly for retailers
- provide a statistically robust, accessible source of data on what consumers are actually paying – linking their retail arrangements and usage to understand both overall bills and market outcomes
- track ongoing outcomes (rather than in-frequent surveys) and be readily accessible in a timely way by a range of regulators.
- Ideally be able to be link analysis to a range of factors, such as regional demographics and DER services, hardship programs or jurisdictional subsidies.

This measure will:

- Reduce burden on retailers - the options proposed seek to be lower cost than existing duplication, building on recent work and automation
- Increase consumer choice by supporting low constraints and innovation. Transparency can reduce regulation. DMO may not have been needed if it was clear that vulnerable consumers were on reasonable tariffs.
- Not change regulatory roles – supports existing roles through data sharing
- Continue privacy protection - builds on existing protected data and aggregate analysis.

Benefits

1. Understanding what consumers are actually paying – including changing benefits, needs and behaviours over time – to support policy seeking better consumer outcomes. Particularly an issue for vulnerable consumers segments.
2. Greater affordability through more transparency in competition and reforms. This includes:
    - That the ability to understand consumer outcomes would be vastly improved for Energy Ministers, with access to current data (rather than limited costs reporting cycles often years old) and ability to drill down into areas of concern.

- Impacts of reforms (such as DMO/VDO) or shocks (such as COVID) could be monitored over time, with policy makers provided direct evidence as to the scale of impact and who is impacted, supporting targeted responses to improve outcomes.
- Issues such as those identified in the ACCC REPI – like consumers being moves over time to less advantageous tariffs, poor outcomes with conditional discounts or consumers switching to deals that are worse for them – could be quickly identified and responded to. These issues particularly affect vulnerable and passive consumers, who are less active in the market.
- ACCC also raised concerns that lack of transparency in retail prices and contracts has contributed to higher retail margins, creating higher prices for all. Increased transparency and associated information powers for the AER, will allow it to monitor, assess and advise Ministers on retail margins on an ongoing basis. This has also been raised in a proposed rule change from ECA.25

3. Better metrics and policy on energy equity – with more visibility of consumer outcomes across consumer segments and time, including differential impacts on vulnerable segments.
4. Better consumer protections, particularly with growing new technologies and services and Post-2025 market reforms such as flexible trading arrangements
   - transparency on consumer impacts of new services supports light-handed, flexible consumer protections, allowing for timely identification and response to emerging risks without imposing constraints on innovation.
5. Streamlining of existing price reporting - reducing current duplication
   - ACCC REPI identified widespread duplication of retail reporting. Retail reporting related obligations current require four national agencies (ACCC, AER, AEMC and ABS) to undertake data gathering. Most jurisdictional regulators are also required to undertake some form of retail reporting of price monitoring, usually accessing data through conditions in jurisdictional retail licences.
   - Reforms since have increased duplication, with ACCC now required to undertake further monitoring until 2025. This provides some further insights to prices but does not provide an ongoing solution. It also uses powers which prevent data being shared with other agencies – increasing duplication of costs.
   - Existing obligations across AEMC, AER, ACCC and jurisdictional regulators drive the current duplication and limitations on data access. These obligations are fixed in different frameworks with different decision makers. The different legal instruments used to request the data currently mean that this data cannot be shared between institutions – reducing opportunities to streamline the processes and reduce costs on retailers.
   - Agencies have limited ability to change these obligations without a collaborative approach to Ministers. Industry stakeholders are also needed to engage in design of options.
6. Support for better forecasting – through greater transparency in how consumer response to market signals
   - This is increasingly important in a future NEM with flexible demand and DER increasingly being moderated by automated technologies responding to system and market signals, e.g., batteries exporting in response to peak prices or electric vehicles charging off-peak prices. There is already evidence of market impacts in response to wide-spread synchronisation – such as spikes created by

[25] This rule change proposal can be found here: https://www.aemc.gov.au/rule-changes/retail-market-transparency

off-peak hot water programs. Transparency of these market signals as they change and ability to analyse technology responds will be critical to local forecasting.

Specific examples include:

- ACCC and AEMC negotiated extensively to be able to share data from retail price monitoring over several years – but found the constraints on ACCC's data gathering powers unable to be resolved.
- ESCOSA currently undertakes retail monitoring through direct requests to the retailers (via licencing obligations) in response to requests from the Minister. Recently ESCOSA was requested to undertake extended reporting to analyse the impact of the DMO on SA consumers. Using their licence conditions ESCOSA sought further data from retailers. However, their report was limited to data on the 30% of consumers who were on 'currently available' market product. This excluded many of the consumers targeted within the DMO, who through lack of active switching have been migrated to poorer tariffs over time.

6.2.3 Network transparency (Priority data gaps)

Design and cost options to optimise network data available to the DER market, including: a review of data use cases and definitions, review and publish relevant existing low-voltage network data, and options to efficiently address priority data gaps.

Create an efficient path to the shared network data needed to optimise DER and inform decisions of DER providers, consumers, and regulators.

DataLAC and the AER will work with expert advisors to:

- Work with key DER and network stakeholders (including ongoing research such as RACE and DEIP).
- Identify priority use cases for network data to inform DER decisions and define required data sets and optimal form of the data.
- Gather and review existing data sets to meet these needs (across networks, DER provider, AEMO and wider data sources) – leveraging AER existing data powers.
- Develop and implement initial processes to release available data.
- Identify priority gaps in available data and cost/benefits to resolve.
- Recommend options to resolve priority gaps over time.

Optimising DER integration requires greater visibility of the low voltage network, with needs for networks, network service providers, DER investors/service providers, consumers, and regulators to all manage risks around network and DER capacity and emerging constraints.

As regulated monopolies, networks should be required to be appropriately transparent about constraints placed on consumers – such as constraints on DER export. Currently networks are required to publish detailed information and consult on how network prices are developed, as well as higher level data on network planning. They do not yet have requirements to publish details supporting DER constraints.

Low voltage network transparency is challenging to achieve in the short term, with diverse levels of data currently available across different networks, a wide range of data gap and significant costs to resolve data gaps. Work is underway in this space, for example through DEIP and RACE and the AEMC Metering Review, looking at optimal data sets and definitions, and a range of alternatives to access or model data. Data released could take a range of forms. But in a circular problem, limited access to network data is a barrier to resolving these questions.

Unlike any of these ongoing processes, the AER has the ability to leverage its existing data gathering powers to accelerate this work, bringing forward requirements to release data. Given some network areas do have

data available, such as most of Victoria, options to bring forward existing data, evaluate these data sets and develop a pathway to resolve gaps has material benefits.

Benefits/Impacts

1. Lower network/DER costs in integrating DER
    - Enables greater use of existing network capacity – existing data allowing DER and network service providers to target development around emerging constraints, managing their own risks and optimising local outcomes.
    - Lower DER constraints - empowering consumers, DER providers, and regulators to better engage with network to increase efficiency, understanding and acceptance of any DER constraints deemed necessary
    - Better targeting of network expansions – allows for constraints and DER impacts of localised issues to be more transparently considered by alternative service providers and regulators.
2. Accelerates Low Voltage network visibility
    - Disrupts current barriers to progress – using AER's powers to access existing data, bringing forward benefits, and creates a pathway to prioritise further investments.
    - Prioritising data gaps to be resolved - supports networks and AER in developing/considering business cases and/or incentives to increase network data and visibility over time.
    - Supports wider research outcomes on network visibility options with AER helping to facilitate immediate data inputs and initial priorities (such as through DEIP and RACE).

Specific examples include:

- Victorian networks have wide-spread visibility of their network due to the smart meter role out. Some of these networks use this data to provide localised advice on constraints, but how this is determined is opaque. These data sets could be leveraged as a case study to develop the most useful ways to communicate this information to the market.
- Essential Energy has been undertaking trials with using NBN data to inform local network performance. Learnings from these activities could also provide a case study for options to meet wider data needs.
- SAPN in South Australia has the highest penetration of DER with only limited network monitoring. Their recent regulatory applications indicate around 600 / 19,856 residential LV transformers monitored, around 1000 sites reporting from existing VPP trials and limited input from competitive smart meters. Currently export constraints in SA are at 5kV but SAPN has indicated without resolving network visibility this will need to drop to 1-1.5kV in the near future. Working with SAPN, SA government has implicitly identified a range of areas needing network support, by providing incentives to install batteries - but only in a targeted number of suburbs. If network hosting capacity and constraints were more widely visible, the market could also create these kinds of incentives as network support services.

6.2.4 Over-voltage (Priority data gaps)

Estimate the benefits of addressing over-voltage in local networks, including through research on impacts such as damage to consumer equipment, losses and reduced DER constraints.

Aims to support efficient investment in network monitoring and voltage management systems.

DataLAC and AER to lead work with jurisdictional regulators and an expert adviser to:

- Undertake initial scoping or estimates of benefits based on existing research.
- Develop a proposed package of research to resolve areas of uncertainty, such as on appliance impacts, for consideration of appropriate funding paths. This should include consultation with relevant research groups.

Recent studies on voltage levels suggest significant potential benefits in reduced damage to consumer equipment, reduced losses and reduced DER constraints. Current proposals for network monitoring investment rarely include these types of benefits as they remain hard to estimate, focusing instead on maintenance and operational benefits. This may suggest we are underinvesting in network monitoring, limited benefits for effective DER integration.

This workstream needs to be a collaboration across regulators, given split regulator roles where jurisdictional regulators have responsibility for voltage compliance but the AER assess related investment proposals.

Research costs may be material, so the initial approach is a scoping exercise to target phase proposals to potentially appropriate existing research funding sources, such as ARENA.

Benefits/Impacts

- Issues associated with over-voltage was observed as significant across NEM networks. This was highlighted in a recent University of New South Wales (UNSW) study based on Solar Analytics data.[26]
- Benefits of improving voltage management could be significant to consumers.

  Avoided losses:

  - UK trial found 3% energy savings via improved voltage management.
  - 1% savings in Australian grid equates to half a billion dollars, plus emissions reductions

  Protect appliances: Consumers spend many billions on appliances per year. International studies and University of Wollongong suggest the impact of over-voltage on the reduced life of appliances could be material.[27]

  Reduce DER constraints without expanding grid

  - UNSW found constraints already cost some solar systems 30-90% of export across the year. Only in localised constrained areas - but demonstrates potential impact as DER penetration grows and networks become more constrained.

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[26] This study is discussed here: https://prod-energycouncil.energy.slicedtech.com.au/sites/prod.energycouncil/files/200502%20ESB%20cover%20note%20on%20UNSW%20Voltage%20Report.pdf

[27] 'Cause and effect of overvoltage on the LV network' study can be found here: https://scholars.uow.edu.au/display/publication129422

- Some new systems already constrained to zero export (for example, SP Ausnet).

6.2.5 EV Visibility (Priority data gaps)

Design and costs options for reporting installation, location, and characteristics of electric vehicle supply equipment.

Critical to ensure agencies and market participant have sufficient visibility of emerging EV technologies to support efficient and responsive forecasting, planning, and operational management.

DataLAC and AEMO will lead the work on this gap, supported by relevant technical experts:

- Consistent with recommendations from the DEIP EV data taskforce, it will undertake an opportunity assessment to establish a minimum viable product for an Electric Vehicle Supply Equipment standing data register under the existing electricity rules and regulatory frameworks.
- Link to wider consideration of EV forecasting options, including shared approaches with the transport sector.
- Engage stakeholders including DEIP EV task groups to consider related options and recommendations.

There is no clear owner of EV data within the energy sector. AEMO has a need for EV data in forecasting, but this is currently beyond the scope of the existing mandate for the DERR system. Networks and research projects are all seeking their own data sources. The DEIP task force EV Data Taskforce recommended that options for a permanent solution be progressed.

Benefits/Impacts

- EVs are expected to be the largest driver of new demand in the future NEM - but uptake remains highly uncertain with a broad range of scenarios.
- Planning and operational risks inherent to uncertainty around uptake and behaviour of EVs.
- Need to resolve prior to uptake accelerating - risk of a large invisible, passive EV population.
- Coordination with transport sector required - no trigger to capture data in the energy sector.

6.3 Longer term

6.3.1 New Energy Data Framework (Forward planning and adaptability)

Design a future data framework in energy laws to be proposed to Energy Ministers. Ensure energy data frameworks are fit-for-purpose in a digitalised future NEM.

DataLAC will engage an expert legal team to:

- Design and cost an appropriate framework, based on findings of the KWM and Galexia legal review of energy data and progress in wider national reforms.
- Engage workshops across agency and jurisdictional legal teams, to ensure it meets requirements, along with supporting analysis.
- Develop recommendations for Energy Ministers.

ESB undertook a review of energy data legal frameworks and a range of international case studies, as a key input into the Data Strategy, led by KWM and Galexia.

A key recommendation of this review was that a new energy data framework was required, as complexity and inconsistencies in current frameworks caused barriers and uncertainty inconsistent with consumer benefits and not fit-for-purpose in the changing needs of a digitalised future.

The new energy data framework should:

- Empower new high level data principles.
- Define clear purposes/criteria for which data can and can't be shared.
- Define clear requirements for safe sharing and management of data.
- Define flexible, governance arrangements support these decisions, adaptable to changing needs over time.
- Align with the policy directions of national reforms such as the data availability and transparency reforms and the CDR.

Benefits/Impacts

- New laws support a paradigm shift and behaviour change to enable data rights which benefit consumers.
- Supports greater sharing by reducing risks/uncertainty for data holders through clearer requirements and greater alignment with wider laws.
- Greater security, consumer protections and social licence through clearer safety requirements and supporting systems.
- Principle/criteria based for greater adaptability to new data needs and changing roles and responsibilities. This is important in a future NEM as changing technologies and market structures will drive ongoing new requirements.

6.3.2 Research data (Forward planning and adaptability)

Propose models to improve access to and use of data in research. Reduce risks in integration of emerging energy technologies by enabling informed and timely research and innovation.

DataLAC and the Data Reference Group will:

- bring together a focus group of research-sector stakeholders to propose models to improve access to research data sets.
- Consider opportunities to leverage existing research collaborations and sources, such as NEAR, RACE, C4NET, and ARENA's Knowledge Bank.
- Consider leverage of wider work on research data commons and advanced data approaches such as synthesised data sets and collaborative facilitation.
- Provide recommendations to Energy Ministers.

Benefit/Impacts

- Optimising integration of emerging technologies in the future NEM continues to depend on technology trials, as system integration approaches are yet to develop and will take a long time to mature, with new technologies continuing to emerge.
- Many publicly funded energy technology research projects (such as through ARENA and RACE) face significant delays or barriers in access the data required, even where industry partners are actively supporting. This can reduce benefits from funding. Often there are unexpected barriers in sharing

data, due to varied legal advice, or the data simply doesn't exist, such with technologies like EVs which are not yet widespread.

- Data outputs from past research project have also frequently been under leveraged, reducing their benefit. For example, due to lack of appropriate consents.
- There have been a number of proposals for advance data sharing approaches emerging which could provide more widely spread access to data for researchers – such as synthesised data sets which enable common and open-data platforms. This can significantly increase research outcomes, engaging of a more widespread research ecosystem across many interacting projects and experts. This empowers more organic innovation across the research community outside of limited data-access constraints.

6.3.3 Regular Forward Review (Forward planning and adaptability)

Undertake a proactive regular review of Strategy progress and data needs. Set forward priorities and ensure that emerging data needs are address in a timely manner.

DataLAC will undertake a regular review to assess and set forward priorities:

- Engage with the Data Reference Group and wider stakeholders.
- Provide recommendations to SCO and Energy Ministers on progress and revised priorities in respect of emerging data risks and needs.

Benefits/impacts

- Lack of clear ownership of many emerging data issues causes delayed response and results in costs to consumers, for example:
    - where forecasts miss changing uptake of emerging technologies, changing demand profiles.
    - where technologies begin to roll out without effective data standards or interoperability
    - where new services roll out while consumers still lack the information to make effective choices.
- Review provides a clear mandate to resolve collective emerging issues.

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