1 September 2023

Mr Hrishikesh Desai
Chief Data Strategist
Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601

Submitted via website: NetworkVisibility@aer.gov.au

Dear Mr Desai,

Benefits of increased visibility of networks – consultation paper

CitiPower, Powercor and United Energy (our networks) welcome the opportunity to respond to Australian Energy Regulator's (AER) consultation on the benefits of increased visibility of networks.

The consultation paper assumes distributors have granular and accurate information associated with the operations and limits of their low voltage networks. Therefore it is relatively cost effective to make this information available to third parties. Unfortunately this assumption is not true.

Even though we have an extensive smart meter network, there are gaps in our visibility of the LV network. We still rely on modelling and network analysis to determine limits and performance. To fundamentally meet the needs of this consultation paper would require investment in data sensing, storage, management and analytics which may not be cost efficient.

 Our submission wishes to make the following points:

- we already make available a range of network data free of charge to customers which is designed to support third party service providers and market participants to develop contestable solutions as well as to support customers making informed decisions about their electricity use and investments

- each distributor will be required to build their own systems to provide data. With distributors using different systems at different stages of maturity with potentially different approaches, generalised assumptions around costs are not appropriate

- careful consideration is required of the need for granular data at the distribution substation and low voltage (LV) level. Aggregated data at this level of networks will be expensive to acquire reliably, and is likely to be unreliable and for most customers, not necessary

- standardising data is costly and not necessary. It is important that the basis of how the data has been generated is understood (basis of preparation) rather than seeking to redesign distributors systems and processes creating significant additional workload for minimal benefit

- seeking to define principles for the provision of data to customers is preferable to defining specific data that should be provided because principles will maintain flexibility to provide new and different types of data that may become available in the future

- data without context will not meet customer needs. Distributors are best placed to work with customers to meet their needs, provide data interpretation and facilitate follow-up requests

- the data provided under standard control should only be the data that can demonstrably be shown to provide broader benefits to society, or able to readily and efficiently supplied through self-service portals. Much of the request does not meet this benchmark

- our stakeholders have demonstrated a clear preference for visualisation of information (such as Map Insights and Rosetta) over machine readable data.

- we have strong evidence from our engagement with customers that demonstrates an interest in data accessibility

Should you have any queries, please contact Brent Cleeve on ███████████ or ███████████████████

Yours sincerely,

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Renate Vogt
General Manager Regulation
CitiPower, Powercor and United Energy

Appendix 1

1. Is the set of use cases in Appendix 6.4 representative of the use cases you are aware of?

Customer sentiment is changing towards embedded generation technologies. Customers are more educated on monitoring energy usage, and they are requesting, easier access to, and visibility of, network data. Requests for network data are increasing. We have recorded 87 requests so far this year for non-self-serve network data. These requests exclude data stakeholders that have been able to access data through self-service portals.

Whilst demand for data amongst stakeholders continues to grow, we need to ensure there is perspective that

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Box 1: Broad and wide engagement findings, October 2022

Through our reset stakeholder 'broad and wide' engagement, customers consistently displayed an interest in receiving data that advised them of the energy they use at different times of the day and how much each of their appliances cost to run.

However, whilst most customers liked the idea of access to real time energy usage data, they were not willing to pay more for it. Motivated residential customers were satisfied with the information available on platforms such as Powerpal, which is make available free of charge by the Victorian Government. More sophisticated residential customers used either a digital application associated with solar or storage installations or home energy management systems (HEMS). These options provided customers a choice and a discrete value proposition for how they use the data.

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the demand is not overstated. Through our reset stakeholder engagement program and customer valuation of service improvements research, stakeholders have repeatedly told us that whilst increasing the availability of data is good, they are not necessarily willing to pay for the provision of the data. It is sometimes also not clear for what purpose that data would be used by the stakeholder. This is especially true for real time data.

With that caveat, we are highly supportive of extending the network data available to stakeholders. Providing transparent, broad and standardised network data supports stakeholders in delivering renewable energy-based projects and developing new business models that increase the value of CER. There are broader benefits in assisting stakeholders to understand why they may have no ability to export and assisting stakeholders to identify whether investment in CER is prudent based on available network capacity.

During the 2021-2026 regulatory determination, our networks proposed a Digital Network business case. Amongst other things, Digital Network sought to implement more advanced technologies capabilities through more sophisticated analytical, monitoring and management capabilities. The Digital Network business case continues to be rolled out as part of a larger 10-year program.

Today, our stakeholders already have unrivalled access to network data such as:

- consumption data, zone substation (ZSS) historical load data and regulatory information notice data available in Excel
- network voltage reports, regulatory Investment tests and distribution annual planning reports (DAPR) all provided in Adobe
- network visualisation provided through Rosetta
- customised network data requests which are provided to stakeholders in a variety of formats.

Rosetta, following the highly successful trial we undertook of a bespoke Map Insights solution in 2022, allows for the first time the publication of DAPR constraints and other relevant network data in a visualised form easier for stakeholders to read and interpret. Our experience with data has seen little support for machine readable style data and a strong preference for visualisation tools that set data in context.

A new process has been implemented for network data requests through our websites. This new service is tailored for data requests that cannot be met via our existing customer self-service portals. The service has been

introduced following trial of a customised service through Centre for New Energy Technologies (C4NET) during 2021 and 2022, that did not always satisfy our stakeholders needs.

A key failing identified when data provision was outsourced was the lack of context provided with the data. Context requires an understanding of the network spatially (i.e. what's in the geographic information system (GIS)), the physical network in terms of its capability and the operational network in terms of its 'switched' state. For stakeholders there is an underlying data set (i.e. network model) and operational practice that isn't being asked for, but that will be needed, for the other data to make sense or be used for decision making.

Data requests are received from a large range of stakeholders including residential, small business customers, commercial customers, government, community groups, universities, consultants, councils, developers and renewable generators. These are all identified in the consultation paper. The data sought typically includes consumption data, postcode/wider area generation and consumption data, network voltage reports, zone substation historical data, network constraint data, industry boundaries, high voltage (HV) network data, electrical engineering data (i.e. fault levels, current flow information (SCADA), feeder protective settings etc, network topography (GIS layers, files, drawings etc), network analytics (network models, highly sophisticated requests) and customer data (i.e. solar connections, export approval rates).

Appendix 1 summarises the data types requested, who is requesting that data, its purpose, privacy considerations, regulatory obligations to provide, internal complexity in providing the data and its format.

There is an increasing number, and varying nature, of network data requests that must be assessed for privacy and Foreign Investment Review Board (FIRB) compliance. There are no clear views on our obligations and positions to balance provision of data that is helpful to data requestors but also appropriately protects the personal and private information of our customers and asset information. Our networks implemented our own Provision of Network Data Privacy Guideline earlier this year in an effort to streamline assessment of privacy and FIRB considerations.

2. What additional use cases should be added?

> **Box 2: Customer valuation of access to information**
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> We tested the value customers placed on service improvements including access to data from business and residential customers. Except for outage information, most customers advised they were not making significant or recurring decisions based on data supplied by us.
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> Based on independent analysis, we found residential customers were only willing to pay an additional $0.12 per annum for access to more data. It was valued more highly by business customers at $1.15 per annum.

Use cases are best identified by stakeholders rather than distribution businesses.

Our research (detailed in box 2) shows that customers often seek access to data but are deterred by the cost to provide it.

Data such as outage restoration times, planned outage works and information about distribution substations is not readily available or not in a form that could be published without additional effort.

There is a distinction that needs to be drawn on use cases. Whilst there may be a business case for certain stakeholders, that may not be the case for the larger pool of stakeholders. In such cases it is not appropriate that the cost of providing that data be recovered from all customers and consideration needs to be given to certain data being provided based on an alternative control fixed charge or quoted service.

3. Are there other sources of data that should be considered?

Our networks are subject to extensive reporting requirements administered by the Australian Energy Regulator and the Essential Services Commission. As such, some of the network data identified in the consultation paper is

already held by these entities and could potentially be supplied by them in a de-identified form. Energy retailers may also hold some of the data identified in the consultation paper.

Data such as outage restoration times, planned outage works and information about distribution substations is not readily available or not in a form that could be published without additional effort.

4. Do you agree with the framing parameters that have were used? If not, why, and what should have been included or left out?

We have no specific comments on the framing parameters. They appear broadly appropriate.

5. Are the data sets that have been identified and prioritised the correct ones? Are there others needed? Are any listed not needed?

As part of the Digital Network program approved by the AER during the 2021-2026 regulatory reset, our networks are on a multi-regulatory period journey to build our data capability including being able to provide this data to external stakeholders. The consultation paper appears to conflate regulatory obligations we have today, such as the DAPR and RINs, with obligations we may have post 2026. For example, data related to flexible exports is identified and the consultation paper assumes that this data exists today. The data and the systems for handling flexible export information will not be available until the next regulatory period (2026-2031) following trials and exploration in the current period. In relation to export capability, it may be worth the AER considering the value of this data if customers are progressively offered flexible export agreements by our networks.

The consultation paper notes with respect to hosting capacity plans 'DNSPs already produce these forecasts as part of their planning'. This is not the case, especially since the customer export curtailment value (CECV) is a new methodology. The process for understanding how to deploy CECV is very much in its infancy and is something the industry is grappling with. There seems to be an expectation that we'll have a 10-year plan for both load and export capacity related augmentation down to the distribution substation level and even at the LV level. This is not practical when you employ a probabilistic planning approach such as in Victoria.

In terms of identification and priorisation, our experience with stakeholders is different to that identified in the consultation paper. For example, one of the benefits quoted is 'customers seeking to install roof top solar'. We already provide our customers a more nuanced assessment tool for export capacity through our free digital connection service via our websites ('eConnect' for CitiPower and Powercor and 'myEnergy' for United Energy). These systems use real, localised network data including capacity, connections and voltage considerations to provide an immediate response to requests for export pre-approval. Over 95% of customers are approved for the full export levels requested.

The consultation paper states large customers are ready to benefit from the provision of the data identified in the consultation paper today. Our experience is this is not the case. Zone substation and feeder data is readily available for our large customers today, yet its usage is negligible. Instead we find large customers routinely approaching our networks with enquiries to understand the potential for a connection without any reference to the data online.

Box 3: Broad and wide finding number 2

Our reset 'broad and wide' engagement program found customers had an interest in receiving data that tells them how much energy they use at different times of the day and how much each of their appliances cost to run. However whilst most customers liked the idea of access to real time energy usage data but were not willing to pay more for this.

There was also an opportunity identified is however, an opportunity to explore the potential utility and willingness to pay of commercial and industrial customers and other key stakeholders such as governments and aggregators for this data. Whilst residential customers were hesitant to pay for this data, this was largely driven by a lack of understanding of how to interpret the data and what it means for them.

Reference to the provision of raw data for stakeholders is made in the consultation paper. Again, in our experience raw data is not usable by stakeholders. The only entity with an interest, and the capability, to use such data is the Australian Energy Market Operator (AEMO). Even then, AEMO will also require both network models and network hierarchy data in order for the data to be usable.

The consultation paper uses the term 'raw underlying data' a lot. It appears to infer we can simply share raw data. This presumption ignores the fact that all data requires some form of pre-processing to extract from systems used as part of business as usual processes. It must also be assessed for accuracy, aggregated and assessed to ensure that there no breach of customer privacy. Data is only usable when set in context, which from our perspective requires significant time and investment in new systems and tools that do not exist today and that do not appear to be considered in the consultation.

For example:

- for distribution substation data, to meet the consultation paper requirement to publish an aggregate of all customers smart meter data behind a specific distribution substation, will require the identification of all relevant national meter identifiers (NMIs) and for those to mapped to a specific distribution substation. It is only after this point the data can be aggregated. Further, our low voltage network is dynamic. This means mapping of NMI to distribution substations can change daily, especially in urban environments. Thus, the task of aggregation remains highly manual and fraught with confidentiality risks

- for feeder data, while SCADA data is already aggregated, it only represents usage at a single geographic point. Feeders have both different loadings and capacities along their length. Our networks, along with all DNSP's, have only limited measurement points for loading along individual feeders.

- full definition of feeder capacity also relies on detailed information around changes in conductor, or specific safety based limits on a feeder that may not all be fully represented in GIS systems and only evident in detailed design drawings. The only way we can define this is through building power system models to assess usage and loading at non-measurement points. A feeder's capacity through time will also vary with new connections, operational transfers and changes behind the meter that are not visible to us at the macro level.

6. Do you agree with the conclusions reached regarding the need for real time data?

We agree with the consultation paper that the cost to provide real time data of any type would far exceed the benefits market participants would receive.

We have and continue to engage with our stakeholders on the need for real time data through our reset development. These engagements identified that whilst customers like the idea of real time data, identification of use cases for real time data is more difficult. Stakeholders were often not comfortable that the costs of providing real time data would ever be offset by the benefits and that in many cases they could access such information through other ways e.g. home area management system (HEMS).

Box 4: Appliance-specific, real-time data and notifications

Monash University's Future Home Demand report found some customers wanted the option to get real-time feedback on their energy consumption via notifications. This included which appliances are using the most energy. They also sought to understand the source of their energy to encourage greater use of renewable energy. This could be provided through HEMs or the customer's retailer.

In the limited number of use cases where real time data was of value, such as that sought by NBN and Telstra, this has been provided at the stakeholders' cost. If there was a need for real time data by other large customers

in the future, we would build similar infrastructure for them at cost i.e. not funded by the broader customer base.

7. Are there more issues that should be considered regarding the balance between customer protection and reasonable data collection?

Customer privacy must be paramount when it comes to individual data on capacity and load. The consultation paper should be careful to not inadvertently divulge or make public individual customer data. For example, there are instances in our networks of a large customer being located on a feeder that contains only 8-12 other customers making their load information readily identifiable. Similarly voltage data, and even asset names can often inadvertently identify energy use behaviours for an individual customer site.

Protection of customer data is a priority for our networks. We have established a Provision of Network Data Privacy Guideline that sets very clear expectations on the disclosure of data including:

- only customer account holders are permitted to obtain data relating to their premises
- third parties are permitted to obtain data only where it is aggregated across greater than ten premises/customers or on authorisation is received from the account holder
- aggregated data, must not exceed 50 customers, if that data is being provided to an overseas requestor (this is consistent with Foreign Investment Review Board (FIRB) compliance obligations)
- the same privacy considerations are afforded to generation data as consumption data
- asset location data, while not breaching any privacy compliance requirement, does pose a significant security risk and we therefore do not provide this information
- information published by regulators or on our own website e.g. DAPRs or RINs are considered low risk.

Compliance with our Provision of Network Data Privacy Guideline is only guaranteed within our network functions. Outsourcing this function to a third party would expose our stakeholders to considerable risk hence we do not recommend the AER consider this alternative.

8. Is there any other feedback on the data set definitions?

A key determinant of the cost of data provision is data set definitions (or standardisation of data set definitions). There is a misconception that data definitions are aligned across distribution businesses or even within distribution businesses. This is not the case.

All data is subject to interpretation. This underlined all RIN data definitions requiring support through basis of preparation (BOPs) documents. Whilst BOPs assist auditors, the AER and stakeholders in understanding the assumptions that went into its generation, that does make the data necessarily comparable across distributors. Even between our three networks, the same data is prepared under different BOPs.

There are good reasons why BOPs are not aligned. Requiring the operational and system changes to support alignment would incur millions of dollars of costs for customers with very little benefit. Even within our own businesses, the data definitions are not aligned, and we have commercially chosen not to pursue alignment as to do so would incur enormous costs with no offsetting benefit within the organisation. Therefore we do not advocate for standardisation but rather use be made of the pre-existing data definitions within each distributor.

The consultation paper considers energy imports and exports as discrete fixed limits, or mutually exclusive variables. The reality is they are interdependent. More load coincident with generation enables greater generation. This issue seems to be ignored, and with the data annualised, has the risk of mis-informing customer in making their energy management decisions.

The consultation paper appears to assume that publishing forecast capability would enable customers to bypass Network Planning. This would not be the case as we would still be required to perform a network study before a connection could occur to ensure safe and reliable network operation is maintained.

9.   Do you agree with the criteria?

We support the identified criteria and suggest that further criteria be adopted. Those that have been identified have had their risk 'understated'.

The consultation paper assumes data held by our networks is of high quality. This is often not the case. For example, we are currently exploring a 'datathon' in collaboration with Monash University Centre for Excellence which would allow students to access specific data sets and work to cleanse the data of anomalies.

Data anomalies gives rise to liability for data inconsistencies. Liability concerns arise if a stakeholder for example relies on data accessed from the distributor to determine their project's export capability. Similar concerns are present when considering load connection requests. We understand that AusNet requires customers to complete a disclaimer before they can access data from their business. This model may have merit given the scope and granularity of the data the consultation paper envisages.

The consultation paper does not recognise the security obligations under which distributors such as our networks operate. We are subject to an extensive number of FIRB and Critical Infrastructure Act requirements that will dictate which data, and how the form of that data, is disclosed. This will limit what data can practically be made available.

10.   Do you see value in these data sets being readily available to the public?

On our websites we already offer stakeholders unparalleled access to our network data. This includes:

- Network visualisation portal - this geographical map contains multiple layers of information about the location of our network assets and opportunities to support the network. These layers provide constraints on sub-transmission lines, zone substations and high voltage feeders, which are opportunities for demand management. There are high voltage network maps illustrating the locations of the sub-transmission network, zone substations and high voltage feeders, load trace data for zone substations and network boundaries relative to local government areas and postcodes.
- Distribution Annual Planning Report (DAPR) - provides an overview of the current and future changes we propose to the network. The information provides current and five year forward planning forecasts, system limitations, projects and investments. The Transmission Connection Planning Report (TCPR)

document represents a joint report on transmission connection asset planning in Victoria, prepared by the five Victorian electricity distributors.

- Regulatory Investment Tests for Distribution – a regulatory investment test for distribution (RIT-D) establishes consistent, clear and efficient planning processes for distribution network investments in the National Electricity Market.
- Network voltage reports – we provide network voltage reports that are submitted to the ESC quarterly on our website with network level comparisons published by ESC themselves to benchmark performance.
- Register of completed embedded generation projects – this register of completed embedded generation projects is intended to provide technical information to interested parties on generators successfully connected to networks. Completed embedded generation projects will only be named if their project information is publicly available as part AEMO's generator registration process (projects greater than 5MW).
- Zone substation data – we make available historical load data at each zone substation available on our website. This raw data is provided in a CSV format only.
- Consumption data – this report provides the amount of electricity consumed at a postcode and local government area (LGA) levels. The time series commences from 2016 and provides monthly and annual data. Data is provided for – residential, commercial and solar customers. To protect the privacy, only aggregated information is provided.
- Network data request service – if a stakeholder is unable to identify what they are looking for, they can request network data directly from our networks via an online form. All we require is their contact details and the purpose of their request, so we can ensure that the correct data is provided for an agreed fee.

To see the full set of data, go to www.powercor.com.au and www.unitedenergy.com.au and search for network data. In addition, Regulatory information notices, whilst not available on our websites, are readily available on the AER's.

In terms of the specific data identified in the consultation paper we provide the following comments:

Import capability at site (to be provided annually)	Availability	Comment
Current and forecast remaining capacity	No	Reliable data exists at the feeder level but not at a distribution substation level due to the issues of aggregation. Extending to the distribution substation level for forecasts will be expensive and not possible until post 2026. Even at this point, the ability to reliably forecast a year in advance for small numbers of aggregated customers at the distribution substation level will be low. Distribution substation data will come with confidentiality issues. Concept of a traffic light presentation of remaining capacity will be resource intensive and does not recognise the interdependency between import and export capacity. It also ignores the impact new connections can have on data validity.
Network augmentation plans	Yes	We only currently produce forecasts for the feeder level and above. Hence without forecasts for distribution substations we cannot have a long term forecast for distribution substations. The issues of customer growth will also heavily impact the need for augmentation. Provision of distribution substation data is yet to be discussed even within the business.
Indicative annual deferral value	Yes	This is provided under our current reporting obligations for feeder level and above. No information is available for distribution substations and not in CPU's current plans for data development.

Export capability at site (to be provided DNSP and updated every six months)	Availability	Comment
Current and forecast remaining export capability (kW)	No	We have not been advised on the method or approach to be applied to the calculation of static export limits and intrinsic hosting capacity. For Victoria, the methodology may be directed by DEECA. This will require new systems and equipment to generate data. It will also require significant data processing/cleansing which make this a high cost set of data to provide. The dynamic nature of urban environments make mapping of NMIs to distribution substations difficult. It is also not clear whether the consultation paper traffic light presentation is referring to voltage or thermal constraints or an amalgamation. It's noted this initiative is intended to assist customers seeking to install roof top solar. Our customers already have access to this functionality through the our solar export pre-approval service available through our digital service portals.
Hosting capacity plans	Yes	These plans again exist only at a feeder level and above. There are no plans to extend this to distribution substations until post 2026.
Indicative annual deferral value	Yes	Only available for feeder level and above.
Curtailment by locality or DSS	No	Original equipment manufacturers (OEMs) don't provide this information to us and are not mandated to do so. No mechanisms are currently available to store this information either.

Network performance at a connection (provided six monthly or annually)	Availability	Comment
Power system quality, primarily Voltage, at the connection point	No	Average voltage information is not a relevant metric when a DNSPs obligations relate to maximum and minimum voltage. Reporting should align with the ESC quarterly reporting requirements.
Outage information (SAIDI, SAIFI)	No	Whilst we have this data, it is not readily available in a form that can be shared with stakeholders. We do however publish annualised data and the targets for the coming year in the newspaper.

Network operational performance (to be provided)	Availability	Comment
Near real time outage data	No	We provide data on our website via our live outage map. This includes cause, estimated restoration time, location and customer numbers. These details are often estimations and subject to change – particularly early in a fault when the cause is typically 'under investigation.' We don't show any information regarding planned interruptions. These are subject to rigorous regulatory obligations under clause 11.4 of the EDCoP so could not be made readily available. Some third parties have direct access to outage data such as emergency services.

11. Is any important data missing?

We only have visibility of 40 per cent of our network load. Smart meter reading only applies to residential and small business customers. Information on larger customers (who make up the remaining 60 per cent of load) is held by contestable meter providers.

We don't hold any data at the distribution substation level (import or export capability). Providing data at this level of granularity would require material investment in a range of systems involving more than $21 million. Maintaining (accuracy, availability, licensing) the data would require in the range of $11 million per annum.

> **Box 6: Identifying a customer service incentive scheme**
>
> Research in developing our 2026-2031 customer service incentive scheme identified the top priority across our networks was customer outage data. This included accurate outage restoration times, accuracy of information during an outage and timeliness of outage awareness messages during an unplanned outage.

The consultation paper assumes that we have full visibility of our network, however our lack of visibility of commercial load or distribution substation data shows this is not the case.

In recognition the costs of providing data is not trivial, our networks have been considering and consulting, along with other Victorian distributors on how best to provide the types of data that customers are requesting in an efficient, cost-effective way that considers who the beneficiaries are, and who is best placed to pay for the costs. The principles we have agreed upon are:

- residential standard control services data provision (costs recovered across all customers through general charges) should apply where there are benefits to customers from the broad provision of data (i.e. consumption data)

- recovery through standard control services when there are overall efficiencies from developing a system or portal that can efficiently provide data to customers
- alternate control service charges where the benefits of providing data accrue to an individual or organisation (allows for flexible provision of a range of data that is individually tailored to meet customer requests and suitable into the future)
- alternate control services recovery where advisory services are sought for provision of advice to provide context around the data e.g. customer requests advice on where they should connect to the network.

As mentioned, we don't have the tools to provide distribution substation data today. However, distribution substation forecasting has been identified as an enabler for the efficient integration of CER. We therefore intend to include a material project for this in our regulatory proposals for the upcoming regulatory period.

Growth in CER means stakeholders expect more information on how the network performs. A key aspect of the material project business cases will be the development of better visualisation based upon a 'digital twin' of our network. Our present data sets are disparate and require extensive extraction and manipulation to support analysis and decision making.

Box 7: Ambient data feedback

The Monash University's Future Home Demand report identified customers are seeking ambient notifications about their energy usage (e.g. a chime or glowing lamp placed in the home). This was envisioned to encourage making energy management a shared responsibility with other members of the household (such as children and those less interested in energy management and traditional data), and created a more intuitive way to understand the relationship between household practices and energy consumption.

The data visualisation project will enable us to get better at providing consistent network performance data to support growing external data requirements of stakeholders and provision of more flexible network connections.

By overlaying visualisation on a digital twin representation of our network will provide greater integrated insights, enabling smarter decisions that enhance safety outcomes, support our customers as they increasingly adopt new innovations, all while keeping operation of the network efficient.

Box 8: Preliminary cost estimates

Despite investment over the current regulatory period under our Digital Networks program, further investment will be necessary over the 2026-2031 regulatory period to realise the outcomes of the consultation paper.

We are currently preparing and continuing to engage with our stakeholders on the development of regulatory proposal. In our preliminary work, data functionalities being explored to support delivery of the consultation paper outcomes include digital twin and data hub capabilities. The initial capital investment over 2026-2031 is estimated at $21 million and on-going costs of $11 million p.a.

In addition, data visualisation enables:

- greater speed in decision making and targeting of efficiency in major event management
- the ability to operate and optimise the network to meet safety, resilience and distribution system operator challenges
- providing curated data sets to support network planning, non-network option assessments and risk and condition-based asset management decision making.

Data & requestors | Types of data requested over the last 6 months, reasons for request and obligations

Data Type	Customers/ stakeholders	Purpose	Subject to privacy?	Obligated to provide? Y/N	Provision complexity (H/M/L)	Format/ location
Distribution Annual Planning Report (DAPR) • Provides information about actual and forecast network constraints		• Regulatory requirement	No	Yes	Medium	Report/ Website
Consumption (account holder) • Provides information on electricity usage		• Regulatory requirement • Monitor usage • Compare retail plans	Yes	Yes	Low	Dashboard/ Website
Consumption (other party)		• Regulatory requirement • Monitor usage • Compare retail plans • Feasibility studies	Yes, unless authorised by account holder or aggregated/ deidentified	No, unless authorised by account holder	Medium	Dashboard/Website Spreadsheet or .CSV file
Power quality (account holder) • Provides information on premises voltage, amps & current in 5min intervals		• Regulatory requirement	Yes	Yes	Low	Spreadsheet or .CSV file
Power quality (other party)		TBC	Yes, unless authorised by account holder or aggregated/ deidentified	No, unless authorised by account holder	Low/Medium	Spreadsheet or .CSV file

Legend: Residential/ Commercial consumers   Solar farms   Councils   Consultants   Universities   Developers   Government Bodies[1]

1. E.g. DEWLP, AER etc

Data & requestors | Types of data requested over the last 6 months, reasons for request and obligations

Data Type	Customers/ Stakeholders	Purpose	Subject to privacy?	Obligated to provide? Y/N	Provision complexity (H/M/L)	Format/ location
Calculated power quality (account holder) • Provides the average, minimum and maximum on premises voltage, amps & current		• Show stable state, dips and peaks in supply	Yes	No	Medium	Spreadsheet or .CSV file
Calculated power quality (other party)		• Show stable state, dips and peaks in supply • Model voltage evolution	Yes, if a single account or unless aggregated/ deidentified	No	Medium	Spreadsheet or .CSV file
Random area sample • Provides summary data (e.g. at transformer level) within a particular area		• Feasibility studies • EV charging stations • Microgrids	No (data is aggregated)	No	High	Spreadsheet or .CSV file
Reliability • Provides fault information for a particular area/fault		• Regulatory requirement • Monitor outage information • Make a claim	Yes, if a single account or unless aggregated/ deidentified	Yes	Medium	Report / Spreadsheet
Network characteristics (other party) • Provides data at (e.g. at transformer level) on number of solar connections, hot water load, etc.		• Feasibility studies • Plan battery dispatch schedules • EV charging stations	Yes, unless authorised by account holder or aggregated/ deidentified	No – load information available as a 'channel' in consumption data	Medium	Spreadsheet or .CSV file

Legend: Residential/ Commercial consumers   Solar farms   Councils   Consultants   Universities   Developers   Government Bodies[1]

1. E.g. DEWLP, AER etc

Data & requestors | Types of data requested over the last 6 months, reasons for request and obligations

Data Type	Customers/ Stakeholders	Purpose	Subject to privacy?	Obligated to provide? Y/N	Provision complexity (H/M/L)	Format/ location
SCADA (electrical sensors) • Provides information at e.g. feeder or circuit level of current flow		TBC	No if aggregated/ deidentified	No	High	Spreadsheet or .CSV file
Asset information • Provides (e.g. substation or feeder) name, location and rating		• Feasibility studies	No (Could this pose a security risk?)	No	TBC	TBC
Electrical network topology • Provides information on all customers at distribution/zone sub or feeder level	TBC	TBC	No if aggregated/ deidentified	No	High	Spreadsheet or .CSV file
Network models • Provides planning/modelling analysis of the network		• Feasibility studies	No (Could this pose a security risk?)	No	High	TBC

Legend: Residential/ Commercial consumers   Solar farms   Councils   Consultants   Universities   Developers   Government Bodies[1]

1. E.g. DEWLP, AER etc