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Ms Anna Collyer
Chair
Australian Energy Market Commission
Level 15, 60 Castlereagh Street
Sydney NSW 2000

SUBMISSION TO THE AEMC'S INTEGRATED DISTRIBUTION SYSTEM PLANNING RULE CHANGE CONSULTATION PAPER

Dear Anna

Energy Consumers Australia (ECA) is pleased to have the opportunity to respond to the Integrated Distribution System Planning rule change request consultation paper published by the Australian Energy Market Commission (AEMC) on 26 June 2025.

ECA is the national voice for household and small business energy consumers. We advocate for a clean, affordable, and easily accessible energy system that recognises the diversity of consumer needs and circumstances.

We believe that the electricity distribution network planning rules are no longer fit for purpose due to continued growth in rooftop solar and other consumer energy resources and the increasing electrification of transportation and gas appliances.

This rule change request will require that Distribution Network Service Providers (DNSPs) make appropriate use of the data they have — including the wealth of smart meter data that is becoming available — and collect and utilise more data to ensure the distribution network is ready to efficiently accommodate the projected changes to the grid in the coming decades. Our proposed rule change — key elements of which are supported by the Australian Energy Regulator (AER) in their Low-voltage Network Visibility Phase 3 report[1] — will deliver benefits for both consumers and distribution networks by unlocking greater value from existing infrastructure and data.

Dr Kerry Schott, who chaired the Energy Security Board, observed in 2020 that "We now have more data than ever, but it isn't being fully utilised and shared in a way that benefits consumers or provides the information necessary to inform investment in Australia's energy future."[2] Five years later, this remains true.

This rule change presents a huge opportunity to set the data frameworks and governance in a way that prepares us for the energy transition. Since lodging our rule change request, we have developed our thinking further on data — including what data is required in the Integrated Distribution System Plan (IDSP), what its value is, and how to mitigate privacy and security issues — and included this in our response.

Please see the attached submission with our detailed response to the AEMC's consultation paper. We look forward to working collaboratively with the AEMC as it develops its draft determination and with

[1] AER, Low-voltage Network Visibility Phase 3, 2025
[2] IT Wire, Energy Security Board consulting on energy sector reform, 2020

other stakeholders to ensure the best outcome for this rule change, particularly relating to the specific data requirements to be included as part of the rule change.

Sincerely,

Brendan French
Chief Executive Officer

ENERGY CONSUMERS AUSTRALIA

Integrated Distribution System Planning consultation paper

Energy Consumers Australia's submission to the Australian Energy Market Commission

DATE: 24/07/2025

Feedback on the AEMC's Integrated Distribution System Planning consultation paper

Question 1: What are the shortcomings of the current distribution annual planning process?

The Australian energy landscape is changing rapidly. Electrification and consumer energy resources (CER), such as rooftop solar, batteries, electric vehicles (EVs) and their chargers, have gained momentum nationwide due to their ability to significantly lower household energy bills.

While our energy system is becoming increasingly consumer-centred, the rules we currently use to determine how we plan our electricity distribution network were designed for a time when electricity flowed in one direction from large-scale generators to businesses and homes. There is currently no explicit requirement to include an analysis of CER hosting capacity and constraints in the Distribution Annual Planning Reports (DAPRs). Instead, system limitations and planning needs are often identified retrospectively or reactively. Moreover, the five-yearly expenditure assessment process under the regulatory framework is insufficient to keep pace with the rapid and unpredictable growth in CER adoption.[3]

The existing DAPR requires data to be collected at the zone substation level and only focuses on the consumption of power. Much of distribution network infrastructure is located in the low-voltage system, however, and this infrastructure will be challenged to cost-effectively integrate increasing electrification and CER in the future absent more data and more intentional planning from networks. Indeed, given that the existing network is ~35% of retail electricity bills from households today (in an era of high wholesale prices)[4] and the future impacts of electrification and CER, it's reasonable to assume that the greatest risk to future affordability is the cost of the distribution system. Better, ongoing distribution system planning that aims to cost-effectively integrate CER and increased electrification is arguably the best defence against unnecessary future distribution network cost increases.

Furthermore, the lack of frequent, comprehensive and transparent planning and data creates information asymmetries between DNSPs and third-party participants, hindering CER uptake and resulting in less optimal outcomes for consumers. This lack of proactive planning not only reduces the ability to 'right-size' CER investments but also results in inefficient network utilisation. In some cases, this can lead to over-investment in traditional network assets and under-utilisation of flexible, non-network options, ultimately increasing network costs borne by consumers — an issue identified in the 2017 Australian Competition and Consumer Commission (ACCC) Retail Electricity Pricing Inquiry.[5,6] We believe that our proposed rule change will deliver benefits for both consumer and distribution networks by unlocking greater value from existing infrastructure and data.

[3] Energy Consumers Australia, Integrated Distribution System Planning (electricity) rule change request, 2024
[4] Australian Competition & Consumer Commission, Inquiry into the National Electricity Market, December 2024 p. 68
[5] The Conversation, A high price for policy failure: the ten-year story of spiralling electricity bills, 2018
[6] Australian Competition & Consumer Commission, Retail Electricity Pricing Inquiry, Preliminary report, 2017

These issues are summarised succinctly by CSIRO in their National Low-voltage Feeder Taxonomy Study:

> *"...there is a sizeable gap between the amount of data, tools, skills and capabilities required to enable a low-cost bidirectional grid and the current amount of data and digital capability that exists in the sector."*[7]

Question 2: Does distribution network planning need to be further integrated with the ISP?

Rapid growth in electrification is driving an increase in electricity load from 200TWh to 410TWh annually by 2050.[8] While CER unlocks significant cost-savings benefits, these may be largely missed if we don't know whether local distribution networks will be able to accommodate consumer investment in CER and electrification in the next 5 to 10 years.

There is no requirement in the National Electricity Rules (NER) for Distribution Annual Planning Reports (DAPRs) to include an analysis of CER hosting capacity. Further, the calculation of Customer Export Curtailment Values by DNSPs every five years through existing expenditure proposal processes does not occur frequently enough to ensure accurate on-going analysis of hosting capacity. Moreover, this infrequent analysis likely doesn't account for potentially large shifts in CER uptake that can significantly change the analysis.

While current DAPRs have a five-year planning horizon, the Integrated System Plan (ISP) has a 20-year projection horizon and 5–10-year action horizon, with the 2024 ISP making projections through to 2050.[9] Short DNSP expenditure proposal timeframes result in reactive investments as networks reach capacity rather than proactive investments. This is an expensive way to upgrade a network, likely resulting in higher electricity bills and potentially deterring the interest and ability of consumers to electrify and install CER, minimising the benefits this has for both participating and all consumers.

The ISP has delivered significant consumer and system benefits through its broad geographic scope, biennial frequency, and long-term focus. These benefits can, and should, be extended into distribution planning through the introduction of an Integrated Distribution System Plan (IDSP). The IDSP should be developed every two years, in the years alternating with ISP releases. This staggered timing would allow each IDSP to incorporate modelling inputs from the most recent ISP, while also feeding rich localised data and insights back into the following ISP, enabling more coordinated, consistent planning across the transmission and distribution interface.

We strongly believe that better network planning integration with the ISP will increase consistency between transmission and distribution planning, limiting misalignments and improving the overall planning framework. This includes greater coordination on scenarios, assumptions, and modelling inputs, as well as a clearer picture of whole-of-system limitations and opportunities to integrate consumer resources into least-cost system planning.

[7] CSIRO, National Low-voltage Feeder Taxonomy Study, October 2021 p. viii
[8] AEMO, 2024 Integrated System Plan, 2024 p. 25
[9] AEMO, 2024 Integrated System Plan, 2024

Question 3: How can distribution network transparency be improved, including during network planning?

Distribution network transparency can be improved both by sharing the analysis — including the underlying assumptions and input data — DNSPs regularly perform more publicly and broadly. It can also be improved by requiring more specific types of analysis to be conducted. As a principle, if DNSPs are going to receive a ringfencing waiver for an item, the assumption should be that they share all data they use to make their investments into a new sector — such as community batteries or electric vehicle charging infrastructure — publicly.

ECA's proposed rule change requires that DNSPs outline the methods, calculations, and data they will use to provide insight about the state of their networks down to the low-voltage transformer. These data, models, and methods should also be in consistent forms and use consistent methods, to facilitate comparison and share best practice.

A "Network Data and Insights Roadmap" should also be made available and provide insights into how and when DSNPs will collect more — and better — data and improve visibility. These new requirements will bring greater transparency over the decision-making process behind DNSPs' assessment of hosting capacity and capital expenditure needs.

Further, we propose that past, present, and projected data, modelling, and forecasts of the information from the below list are captured in the IDSP and/or publicly accessible online at the level of spatial and temporal resolution determined by the Australian Energy Market Commission (AEMC) in their rule or the Australian Energy Regulator (AER) in guidelines.

- Adoption of solar systems, energy storage systems, EVs, public EV charging stations, and flexible appliances connected within the low-voltage system,
- Low-voltage consumption, both for native demand and operational demand, wherein native demand is the total amount of electricity used by individual consumers and operational demand is the total amount of electricity provided via the distribution network,
- Low-voltage network power and power quality data,
- Estimates of low-voltage consumption met by low-voltage connected generators,
- Smart meter power and power quality data, including usage,
- Change in electrification uptake, including of reticulated gas,
- Change in energy efficiency,
- Low-voltage CER hosting capacity for electric vehicles, public electric vehicle charging infrastructure, electrified gas appliances, and solar systems during the study year, and throughout the planning horizon, assuming no material changes in hosting capacity,
- Best locations for CER and distributed energy resources (DER) at or below the zone substation level in the form of an online network opportunity map,
- Degree of network utilisation, projections, and a plan for improvement, and any other relevant measures of network constraints,
- All other relevant inclusions from the existing DAPR process as outlined in the National Electricity Rules (Section 5.13),

- Any deviations from the above data requirements, reason for deviating, and a detailed plan for how and when the DNSP will develop and share the required information via the “Network Data and Insights Roadmap”.

Increasing the availability of network data will enable independent assessment, increase trust in outputs produced by networks, and improve decision-making processes for all, including regulators, networks, and consumers.

We hope that the consultation process conducted by the Commission in considering this rule change results in priority use cases for which greater network transparency is most valuable.

Question 4: Is a new distribution planning process required?

A new distribution process is required to enable more cost-effective integration of CER and increasing electrification and to better align and integrate the distribution system into the ISP. This new planning process can reduce the information asymmetry between DNSPs and other market participants relevant to the provision of new energy services. The AER, the NSW government, and the CER Task Force all have pointed to the value of the new distribution planning process requested through this rule change request.

There is currently a disconnect between the ISP, which forecasts significant CER uptake and electrification, and the reality that local networks may not be able to support this level of investment over the next 5 to 10 years. Additionally, current DAPRs are not required to include an analysis of CER hosting capacity, and the assessment undertaken every five years through existing expenditure proposal processes is not sufficient to guarantee that DNSPs can account for the forecasted large shifts of CER uptake.

This also creates an asymmetry of information between DNSPs and third-party participants. There is currently a missed opportunity to support more informed, proactive, and cost-effective investments — both network and non-network — that would enable consumers to adopt CER at least-cost. This could potentially avoid costly network upgrades by improving consideration of non-network solutions by DNSPs in their planning approach.[10]

Networks should be required to produce a biennial IDSP, which will replace the DAPRs and provide more frequent, comprehensive, and granular insights. Compared to current planning approaches, this is a whole-of-system and whole-of-customer approach to planning, aligning distribution planning with the ISP and unlocking greater value through shared, standardised data and improved coordination between consumers, DNSPs, the Australian Energy Market Operator (AEMO), and regulators.

Some outputs, notably online CER hosting capacity maps, will need to be updated no less than every three months to accurately reflect rapid changes in CER uptake and electrification, given how quickly and substantially hosting capacity can change over time as electricity demand changes and new rooftop solar, batteries, and EVs enter the system.[11]

[10] C4NET, Techno-Economic Modelling of Non-Network Solutions, 2025 p. 9
[11] AER, Insights into Australia's growing two-way energy system, 2024 p 19.

Key elements of this rule change are supported by the AER in their Low-voltage Network Visibility Phase 3 report.[12] The NSW Transmission Planning Review interim report lists this rule change request amongst work underway to address issues in the NER arrangements for distribution projects.[13] Finally, the CER Taskforce's consultation papers on the M2 and M3/P5 workstreams identify the IDSP rule change request as work underway to address data issues,[14] and identified the need for more coordination between this initiative and other ongoing data access initiatives.[15]

Question 5: How useful is the proposed data for the IDSP process?

The need for more data and greater visibility into the electricity distribution system, particularly in the low-voltage network,[16] has been identified as a persistent gap in planning and reporting for some time.[17] We believe this rule change request achieves this need without taking a "one size fits all" approach, and recognising the transitional nature of the data and capabilities across DNSPs.

56% of National Electricity Market (NEM) electricity customers have smart meters as of 2024,[18] and this will increasingly approach 100% towards 2030. This represents a tremendous opportunity for networks to leverage this data to enhance low-voltage network visibility. DNSPs will get access to basic power quality data from 1st July 2026 under the accelerating smart meter rollout rule change.[19] This is critical to ensuring that networks can use this data for planning, and via the IDSP everyone can get access to the insights and benefits that smart meters can provide to improve consumer and system outcomes.

It's unclear whether this will apply to live, operational data, particularly as this relates to the Real-time data for consumers rule change request.[20] There are a number of beneficial use cases for DNSPs to have access to live smart meter data — such as fault detection,[21] outage management, and real-time CER integration — which results in benefits to consumers.

Under NER clause 5.13.1(c), DNSPs must undertake annual planning that considers the condition and constraints of their assets. Improving smart meter data access supports this clause and enables more targeted, efficient planning interventions.

The benefits of data collection, sharing, and utilisation are likely to outweigh the costs, but we appreciate that there will be some datasets or spatial and temporal resolutions which have a greater net value to collect. AER have outlined a series of priority datasets,[22] and we generally support the approach of prioritising the highest value data for inclusion in the IDSP first.

Dr Gabrielle Kuiper identified 7 low-voltage visibility value streams and the data required to unlock them, including their measurement intervals, update rates, and sampling densities.[23] This data, acquired at the National Metering Identifier (NMI), can be provided by smart meters, phasor measurement units (network

[12] AER, Low-voltage Network Visibility Phase 3, 2025
[13] Farrierswier, NSW transmission planning review, Interim report, 2025 p. 19
[14] CER Taskforce, Redefining roles and responsibilities for power system and market operations in a high CER future, Consultation paper, 2025 p. 41
[15] CER Taskforce, Data sharing arrangements to inform planning and enable future markets, Consultation paper, 2025 p. 52
[16] AER, Low-voltage Network Visibility Phase 3, 2025
[17] Energy Security Board, Data strategy final recommendations, 2021
[18] DCCEEW, Smart meter rollout turned on for 2025, 2024
[19] AEMC, Accelerating smart meter deployment, Rule determination, 28 November 2024
[20] AEMC, Real-time data for consumers, Directions paper, 30 January 2025
[21] SAPN, Business case: Network visibility, 2025-2030 regulatory proposal, 2024 p. 20
[22] AER, Low-voltage Network Visibility Phase 3, 2025 p. 11
[23] Kuiper, The revolution will be in distribution: Faster, cheaper decarbonisation through integrating distributed energy resources, 2025 p. 9

monitors), and customer energy monitoring and management systems (including from solar and battery inverters).

The Energy Security Board (ESB) identified key use cases for increasing network visibility, including for CER, DER, and virtual power plant (VPP) operators.[24] For example, a homeowner thinking about installing CER — or their installer or agent — might want to understand the likelihood of export curtailment both now and into the future. This would require historical information on curtailment from the network, current and forecast total capacity of PV in the network, and remaining export capability and planned network expansions, with data down to the distribution transformer.

The Enhanced System Planning (ESP) project, coordinated by C4NET and funded by an ECA grant, identified that bottom-up electricity distribution system modelling is feasible and beneficial.[25] However, much of the data required to perform this modelling across the NEM is either not publicly available or lacks consistency in format and granularity. The report makes a number of relevant recommendations, most critically here being:

> "*The ESP has highlighted the criticality of incorporating distribution system considerations in whole of system planning to deliver the lowest cost system, but AEMO can't deliver this by themselves. DNSPs have unique knowledge and insights into their own distribution networks and are well placed to contribute to this integrated planning approach, consistent with their obligations under the AEMC's rule change of improving consideration of demand-side factors in the ISP.*"[26]

In addition to publishing hosting capacity maps at the low-voltage level to enable consumers and third parties to identify the best locations in the grid to place CER and DER, DNSPs should be required to identify and publish a map of suitable poles on their network for hosting public EV charging infrastructure. This would utilise hosting capacity data but would also utilise information about individual pole characteristics. This is an integral part of delivering a public EV charging network in the best interest of consumers in Australia.[27]

AER currently measures network utilisation based on a measure of how well the network is utilised during the hour of annual maximum demand. This is useful to indicate whether networks have too much capacity relative to peak demand, but a least-cost energy system should seek to temper both peak and minimum demand while also increasing the overall usage of the network throughout the day and year. There are other metrics for network utilisation which are better measures of how well the system is utilised throughout the year, such as Total Energy Throughput Utilisation and Two-way Power Flow Utilisation.[28] Implementing these metrics at a high level of spatial granularity is expected to have significant benefits, but requires a level of low-voltage network visibility and other data[29] that is generally not available at this time.

[24] Energy Security Board, Benefits of increased visibility of networks, Consultation paper, 2023 p. 23
[25] C4NET, Enhanced System Planning Project, 2025 p. 30
[26] C4NET, Enhanced System Planning Project, 2025 p. 64
[27] Energy Consumers Australia, Creating accessible and affordable public EV charging networks for Australia, 2025 p. iii, forthcoming
[28] UTS, Reimagining Network Utilisation in the Era of Consumer Energy Resources, 2025 p. 4
[29] UTS, Reimagining Network Utilisation in the Era of Consumer Energy Resources, 2025 p. 66

As we outlined in our rule change request, any existing and additional data collected would be consistent with obligations on DNSPs under AEMC's rule change of improving consideration of demand-side factors in the ISP.[30]

Data should be measured and updated at the appropriate rate, which will depend on the data and their use cases. Key data, information, and insights should be published in the biennial IDSP. As required, some data should be updated more frequently and be accessible online, such as hosting capacity maps, given how quickly and substantially hosting capacity can change over time as electricity demand changes and new rooftop solar, batteries, and EVs enter the system.[31] Hosting capacity also varies throughout a given day.[32]

It's also vital that data, methodologies, and outputs from DNSPs are standardised. C4NET's ESP identified the need for "AEMO to coordinate common methodologies for characterisation of the electrification of space heating/cooling, domestic hot water, EV charging in active distribution systems for planning purposes, including evaluation of the frameworks developed under the ESP."[33] For example, if different networks define and calculate CER hosting capacity differently, it is difficult for a DER provider to compare available hosting capacity across different networks.

Lastly, we encourage the Commission to recognize that the value and utility of data is not always clear until after the data has been collected and analysed. A 2021 report from the RACE for 2030 Cooperative Research Centre explained this challenge well:

> "*Proposals to improve visibility typically rely on estimating the benefits from greater DER integration (which the visibility will enable). Estimating those benefits effectively, however, itself requires improved visibility. Networks struggle to credibly claim the benefits of increasing PV hosting capacity when they are unable to accurately identify the existing hosting capacity of a network. In other words, networks find themselves in a circular argument in which they lack the visibility to justify investments in additional visibility.*"[34]

Question 6: Is a new consultation process needed for the distribution annual planning review?

DNSPs should be required to consult with more stakeholders, particularly communities interested in taking a more particular role in their local supply of energy, when undertaking their planning review — whether that's the DAPR or the IDSP. This engagement should be mandated through a formalised and repeatable process, not limited to regulatory resets. This is critical from a consumer and community agency perspective. For example, if everyone in a community wants a fully electrified suburb, it's integral that the local distribution network engages with them to understand that need and to identify cost-effective ways to realise it.

Many local governments, climate-active councils, and community energy groups have publicly stated goals around full electrification, resilience, and local energy ownership. However, DNSPs are not

[30] AEMC, Improving consideration of demand-side factors in the ISP, Rule determination, 19 December 2024
[31] AER, Insights into Australia's growing two-way energy system, 2024 p 19.
[32] EPRI, The Hosting Capacity Process, 2020 p 4.
[33] C4NET, Enhanced System Planning Project, 2025 p. 62
[34] RACE for 2030, Low voltage network visibility and optimising DER hosting capacity, December 2021 p. 8

currently subject to obligations requiring them to proactively engage or respond to these local ambitions, outside of formal consultation windows associated with the five-yearly regulatory reset process.

Many communities want to be more involved with the design and development of their local energy system for resilience, agency, sustainability, or a variety of other reasons. For example, Rewiring Australia lists 75 'electric communities' working to electrify faster and more effectively.[35] Community groups and councils are showing increasing interest in owning and operating their own community solar and batteries but find it difficult to engage with their network. DNSPs are not required to provide consumers with a way to engage with networks on these issues outside of the five-yearly network reset processes. The five-yearly process, moreover, is largely focused on the network's own view of how it should carry out its business across its service area, rather than the particular needs of discrete communities. More regular consultation by DNSPs with local communities can align community needs and expectations with both network and non-network plans and investments.

Electrify 2515 is a community pilot run by Rewiring Australia which will offer subsidies and support to 500 households to upgrade electric appliances.[36] This project would likely not be possible without the support and engagement they are receiving from the local network, Endeavour Energy. There is no requirement for networks to facilitate these initiatives, and no requirement for them to embed this engagement into their general practice. This is why a new mechanism requiring networks to consult with stakeholders is pivotal.

Opportunities for engagement with networks should be ongoing, but at minimum, consultation with stakeholders should occur during the development of each IDSP every two years (akin to NER 5.12.2 and NER 5.13 for transmission projects). This consultation should include targeted engagement with consumer advocates, local councils, community energy groups, vulnerable customer representatives, and non-network solution providers.

In addition, NER clause 5.13.1(a1) could be expanded to explicitly require DNSPs to undertake public consultation when developing their IDSPs, ensuring alignment with local electrification strategies and stakeholder priorities.

Question 7: Is a Network Data and Insights Roadmap the right tool for implementing the proposed IDSP process?

ECA acknowledges that achieving the increased comprehensiveness of data collection and planning outlined in this rule change request will be a transitional process. This is why we believe that a Network Data and Insights Roadmap that requires DNSPs to outline how they will develop the tools to collect and utilise more data, information, and insights in the future is a practical and proportionate approach. This recognises that the 13 DNSPs in the NEM are at different levels of capability and allows them to plan for their transition at a pace that is ambitious but achievable for them. For example, some networks already publish granular hosting capacity maps with regular updates, while others provide minimal or static information.

[35] Rewiring Australia, Electric communities
[36] Rewiring Australia, Electrify 2515 community pilot

A release date for the Roadmap of July 2027 is reasonable if a final rule is made by June 2026, allowing for 1 year to develop and consult on the Roadmap. If the final rule is delayed, the release date for the Roadmap should also be delayed accordingly.

Alongside the release of the Roadmap in July 2027, we note our request that DNSPs must make all their relevant data and outputs publicly available by the 1st of July 2027. This would initially include data, information, and insights that DNSPs have at that time, and would include more data and outputs at increasingly granular levels over time as each DNSP develops their capabilities as per their Roadmap.

DNSPs should be required to update their Roadmap every 2 years alongside the release of their IDSP. For DNSPs that meet the requirements of the rule change request, they should show how they have met the requirements in their next IDSP. Elements of the Roadmap should be an ongoing part of their IDSP to demonstrate how they are better integrating data and insights into their business. We expect this to be an ongoing process of continuous improvement that has no necessary or clear end date.

For those that haven't met the IDSP requirements by five years from the date of a final determination to change the planning rules, there must be an analysis in their next expenditure proposal identify the costs and benefits of meeting the full IDSP requirements by the end of the next five-year period. At that point, the network and the AER can determine the most appropriate course of action to ensure the network is appropriately planning its future and that consumers and other stakeholders are being adequately informed of the opportunities and challenges within the network's service area.

Progress could be measured under NER clause 8.7.4, which allows the AER to publish performance guidelines and audit compliance with network data collection obligations.

Question 8: Are new guidelines and templates required to standardise the IDSP framework?

There are 13 DNSPs in the NEM which results in 13 DAPRs today and will result in 13 IDSPs with this rule change in its current form. We have heard from a number of stakeholders that the inconsistency in inputs, methodologies, and outputs of networks make it difficult for third parties to use and compare them.

Network hosting capacity and CER hosting capacity are inconsistently defined terms. Different networks have different definitions and calculate these in different ways. Even for networks where hosting capacity information is publicly available, the variation in technical parameters, resolution, update frequency, and access format mean that a third party such as a solar, battery, or EV charging station installer who wants to connect to the distribution network cannot directly compare opportunities between different networks today.

Researchers who want to use network data for modelling, benchmarking, and other analysis tell us that they are hindered by the variation in file formats, data granularity, naming conventions, units of measurement, and update schedules, which can significantly reduce the usability and comparability of the data.

There is a critical need for guidelines, templates, and other standardisation to support efficient network planning. A standardisation framework would result in a material increase in efficiency, reducing administrative and compliance costs for DNSPs and third parties, and a lack of standardisation of data

formats is a barrier to innovation and improving network utilisation.[37] Such a framework would ideally include common definitions (e.g. for CER hosting capacity), standardised file formats (e.g. CSV or GeoJSON), common spatial resolution (e.g. distribution substation level), and clear metadata and documentation requirements.

Achieving this requires a market body, in consultation with the networks themselves, to create guidelines. We believe the AER is best placed to lead the development of these guidelines, templates, and data standards given its existing role in network performance oversight and its responsibility for the system limitation template (under NER 5.13.3).

It is important to note, however, that the AER's current requirements in the case of system limitation templates are insufficient to deliver comparable and readily usable data across DNSPs, due to the different file formats and storage locations.

We recommend that the AER develop IDSP templates and guidelines to ensure consistency across:

- Definitions (e.g. hosting capacity, minimum demand, headroom),
- Calculation methodologies,
- Spatial and temporal resolution, and
- File formats and access methods

However, AEMO should also be engaged in the process, given its role in national system planning and its data needs such as the demand-side factors statement in the ISP as part of the Improving consideration of demand-side factors in the ISP rule change.[38] This would ensure alignment between distribution and transmission planning and help support whole-of-system modelling, and may streamline or replace existing DNSP data provision to AEMO for the ISP.

These templates could be developed and enforced under existing AER guideline powers, such as those in NER clause 8.7.4(a), to standardise distribution network planning outputs and facilitate AER oversight and comparability across DNSPs.

Question 9: Are the proposed benchmarking requirements suitable?

As highlighted in our rule change request, benchmarking aims to improve network behaviour by comparing outputs between peer groups or organisations.[39] This practice is already used by the AER to measure how productively efficient gas and electricity network service providers are at delivering services — both over time and compared with their peers[40] — and inform its assessment of proposed network expenditure.

Similar evaluation processes should be applied to the modelling and methodologies used by each DNSP for its IDSP. Current decision-making processes behind DSNP network capacity assessments lack transparency and provide no guarantee that consumers are getting reasonable value from the investment in the network they are making. If we are to ensure that consumers receive the biggest bang

[37] CSIRO, National Low-voltage Feeder Taxonomy Study, October 2021 p. x
[38] AEMC, Improving consideration of demand-side factors in the ISP, Rule determination, 19 December 2024
[39] Energy Consumers Australia, Integrated Distribution System Planning (Electricity), 2024 p. 6
[40] AER, 2024 Annual Benchmarking Report – Distribution network service providers, 2024 p. iii

for their buck in network services, we must be confident that the analysis networks use to determine the physical capabilities of their system are robust and promote efficient outcomes.

Regular benchmarking of DNSP planning methodologies, inputs, and outputs would allow the AER and third parties (including researchers, consumer groups, and market participants) to:

- Assess whether DNSPs are applying reasonable and consistent assumptions in capacity forecasting, demand projections, and CER hosting capacity assessments,
- Identify variances in investment justifications and assess whether some networks are consistently over- or under-investing,
- Promote transparency and accountability in how DNSPs develop, justify, and implement network expansion or non-network options, and
- Ensure consumers are receiving reasonable value for money from regulated network expenditures.

Benchmarking reports could draw on powers under NER clause 6.27, which allows the AER to compare efficiency and service delivery performance across DNSPs and extend this to include planning methodology and IDSP quality.

Question 10: Are the existing performance metrics for distribution networks no longer useful with the increasing adoption of CER?

Currently, energy policy and regulatory bodies rely on network utilisation metrics to evaluate the efficiency of electricity grid infrastructure and assess how our energy system can be improved at least cost.[41] These metrics estimate whether installed network capacity can meet peak electricity demand, which directly impacts electricity bills: higher network utilisation typically lowers the average cost of delivering energy to consumers.[42]

However, focusing only the annual peak hour of energy demand and aggregating at the whole-of-network level is relevant for less than 0.1% of the time, providing no insight into where and how to obtain more value from the network for the other 99.9% of the time.[43]

These traditional measures were designed around a unidirectional power flow paradigm and do not adequately reflect how networks are used in today's decentralised, bi-directional energy system. For example, they fail to adequately understand:

- The impacts of energy exported to the grid from CERs like rooftop solar,
- Minimum demand periods that strain voltage management and hosting capacity,
- Variability in usage across seasons, and
- The growing importance of two-way energy flows and DER orchestration.

Overall electricity distribution network utilisation is relatively low, with highly localised and rather infrequent constraints. Additionally, network utilisation is expected to change further in the coming years

[41] UTS, Reimagining Network Utilisation in the Era of Consumer Energy Resources, 2024 p. 4
[42] Ibid.
[43] Energy Consumers Australia, Integrated Distribution System Planning (Electricity), 2025 p. 10

due to the electrification of transport and gas, as well as the increased use of export services from CER.[44]

University of Technology Sydney (UTS) research funded by an ECA grant, *Reimagining Network Utilisation in the Era of Consumer Energy Resources*, proposes two alternative metrics to better reflect modern distribution network performance:

- Total Energy Throughput Utilisation (TETU): measures the proportion of total energy (both consumed and exported) that is delivered through a given asset over a period of time, helping assess year-round efficiency and productivity, and
- Two-way Power Flow Utilisation (TPFU): captures how well the network accommodates bidirectional flows, especially relevant for feeders and transformers impacted by CER exports and minimum demand.

Traditional metrics, such as peak demand and reliability (SAIDI/SAIFI), do not reflect the bidirectional nature of modern distribution systems. We recommend that the AER integrate the new metrics into its distribution performance reports, leveraging its powers under NER clause 8.7.4(a) and the National Electricity Law. This could be implemented progressively via the IDSP framework to ensure consistency with evolving network needs. This approach will provide a nuanced picture of utilisation at different times and locations and better align with the realities of our changing power system.

Question 11: How frequently and in what form should the proposed IDSP and supporting data be released?

The IDSP should be released every two years on years alternating with ISP releases to enable opportunities for the outputs of each planning document to feed into each other.

The preferred form for data released outside of the IDSP report is via an online database or map as appropriate. Data should be updated as frequently as it is net beneficial to do so. Some datasets, such as CER hosting capacity, can change significantly over short periods of time,[45] and should be updated every 3 months. Forecasts and planning assumptions may be updated less frequently, such as biennially within the IDSP itself. Real-time or operational data could be updated more regularly if supported by cost-benefit analysis and linked to consumer or system benefits.

The AER could operationalise this process under its existing data publication functions (see NER clause 8.7.4) and consider adopting a data platform model similar to the ISP Inputs Assumptions and Scenarios Report used by AEMO.

Question 12: How should any data privacy concerns be managed?

Under our proposed IDSP framework, DSNPs will be obligated to share information about the condition of their network down to the low-voltage transformer and utilise smart meter data. Specifically, all relevant past, present, and projected data — including modelling and forecasts — should be captured in the IDSP and be publicly available on an online database at the level of spatial and temporal resolution determined by the AEMC or the AER. This encompasses information on solar and battery uptake,

[44] Ibid.
[45] AER, Insights into Australia's growing two-way energy system, 2024 p. 19

electric vehicles and public charging infrastructure, and on the presence of flexible appliances connected to the low-voltage system. Consistent with the acceleration of smart meter deployment,[46] DNSPs should make use of smart meter data and share low-voltage consumption data.

ECA acknowledges that publicly sharing data at such a granular level may raise legitimate privacy, confidentiality, and security concerns, both for individuals and sensitive sites such as military facilities. We understand that in some cases, the disclosure of site-specific load data may be sensitive and could pose security risks.

This issue was identified in the United States, where in 2012 the State and Local Energy Efficiency Action Network (SEE Action) acknowledged the potential of "customer data […] to be the fuel […] for greater energy efficiency"[47] and the need to strike a balance between meeting energy efficiency goals and respecting customer expectations regarding privacy.[48] Industry experience suggests that sharing aggregated customer data generally poses limited risks — as long as individuals cannot be identified — while still allowing energy service providers to identify patterns and better tailor energy efficiency programs.[49] However, SEE Action also noted at the time that the increasing capabilities of analytical tools was raising concerns about their abilities to "reverse engineer aggregated data and identify individual customers".[50]

To prevent this, a number of states in the US have introduced privacy regulations in relation to the release of aggregated energy data.[51] In 2012, the Colorado Public Utilities Commission adopted a "15/15 rule" which prevents the release of aggregated data if the dataset is smaller than 15 customers and that a single customer accounts for more than 15% of the group's total energy consumption.[52] While their aggregation criteria may differ, many utilities have settled on minimum thresholds ranging from two to five meters to protect consumer privacy.[53]

National Grid and Eversource in Massachusetts rely on a 4/50 rule, which allows aggregated energy data to be released, provided that no single customer accounts for more than 50% of the group's total energy consumption and that the dataset includes at least four consumers — making it easier to access data for smaller buildings.[54] A similar threshold exists for Austin Energy in Texas — except a single account cannot represent more than 80% of a designated building's total energy consumption.[55]

Similar measures could be implemented to protect consumer privacy, while specific provisions could be adopted for military facilities and other sensitive areas. These may either strictly exclude military installations from data publication, or apply separate aggregation rules, where a higher threshold could be used across a larger area.

[46] AEMC, Accelerating smart meter deployment, 2024
[47] SEE Action, A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency, 2012 p. 25
[48] Ibid.
[49] SEE Action, A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency, 2012 p. viii
[50] Ibid.
[51] Elevate Energy, Aggregated Data Access: The 15/15 Rule in Illinois and Beyond, 2012
[52] SEE Action, A Regulator's Privacy Guide to Third-Party Data Access for Energy Efficiency, 2012 p. viii
[53] U.S. Department of Energy, Guide to Data Access and Customer Confidentiality, 2016 p.4
[54] Elevate Energy, Aggregated Data Access: The 15/15 Rule in Illinois and Beyond, 2014
[55] U.S. Department of Energy, Guide to Data Access and Customer Confidentiality, 2016 p.4

In Australia, privacy concerns related to energy data are governed by the Privacy Act 1988 (Cth),[56] which requires organisations to handle personal information responsibly. While de-identified data is generally exempt, there is an increasing recognition that sophisticated analytics can potentially re-identify individuals. Additionally, energy infrastructure operators must comply with the Security of Critical Infrastructure Act 2018 (Cth),[57] which mandates risk management programs for electricity assets designated as critical infrastructure. This includes addressing material risks related to cyber and data security.

Importantly, current Australian energy legislation and the NER do not contain explicit provisions regarding the treatment of data from military or sensitive sites within distribution network planning or hosting capacity assessments. Therefore, the proposed IDSP process should incorporate specific data governance and privacy protections for such sites.

CSIRO identified several approaches to privacy for network data, such as differential privacy-based network data cleaning tools which can give mathematically provable guarantees that no information is leaked while maintaining representativeness of the electrical engineering features of the network itself.

CSIRO outlined potential privacy methodologies for network data,[58] including differential privacy techniques for data sanitization that could provide mathematical assurance against information disclosure[59] while preserving the core electrical engineering characteristics of the network.

Question 13: What are your views on the benefits and costs of the proposed solution?

The electricity distribution network is integral to a low-cost energy transition. Today, over one third of Australian households have a small powerplant on their roof. The 2024 ISP's Step Change scenario forecasts a four-fold growth in rooftop solar capacity by 2050, reaching 72 GW.[60] Residential and commercial batteries currently have a capacity of 1 GW but continue to grow as battery costs continue to decline. The 2024 Step Change scenario forecasts this growing to 7 GW in 2029-30 and 34 GW in 2049-50.[61] EV ownership also continues to grow which comes with increased home and public charging load. By 2050, the Progressive Change scenario forecasts 63% of all vehicles are expected to be battery EVs, while the Step Change scenario forecasts 97%.[62] Already today, more than 10% of energy delivered to distribution network customers is from small scale DER.[63]

We know that distributed energy resources — such as rooftop PV, household and neighbourhood batteries — tend to be the cheapest form of energy.[64] Modelling commissioned by ARENA found an additional $12 billion in net benefits to consumers — relative to a baseline scenario — from increasing

[56] Australian Federal Gov., Privacy Act 1988, 10 June 2025
[57] Australian Federal Gov., Security of Critical Infrastructure and Other Legislation Amendment (Enhanced Response and Prevention) Act 2024, 29 November 2024
[58] CSIRO, National Low-voltage Feeder Taxonomy Study, October 2021 p. xii
[59] Dwork, C. & Roth, A., The algorithmic foundations of differential privacy, *Foundations and Trends in Theoretical Computer Science*, V. 9, 2013 p. 211-487
[60] AEMO, 2024 Integrated System Plan, 2024 p. 12
[61] AEMO, 2024 Integrated System Plan, 2024 p. 50
[62] Ibid.
[63] AER, Insights into Australia's growing two-way energy system, 2024 p. 1
[64] Amorie Lovins outlined 207 benefits of distributed resources in 2002. Many of them relate to the size and flexibility of these resources. Lovins, Small is Profitable, 2002.

CER and enabling greater demand flexibility as a result of reducing grid-scale generation and storage costs,[65] which notably does not include network benefits. Other modelling shows that DER and flexible demand could save $11.3 billion in network costs.[66]

However, without highly granular network data, no one knows where these resources are best located to maximise the value they provide to the grid — and therefore to consumers — or where there is sufficient hosting capacity for them. To realise these benefits, it's critical to enhance our understanding of the distribution networks, particularly by increasing low-voltage network visibility.

For example, the Electric Vehicle Council's submission to the ESB's Benefits of increased visibility of networks consultation paper identified that hosting capacity maps assist with identifying suitable sites for EV charging infrastructure.[67] These maps won't completely replace the connection application process, but we expect them to save both the connection application proponent and the DNSP time and effort by reducing the number of applications in areas that have insufficient hosting capacity.

Meanwhile, households are investing hundreds of millions of dollars into smart meters with no requirement that networks use this wealth of data to proactively plan their infrastructure, thus ensuring that the energy transition proceeds apace at least-cost. This is especially critical given the distribution network is the single biggest component of household electricity bills.[68] Increased network visibility leads to benefits for third party DER providers and better decision making by planners and governments, including future distribution system operators (DSOs).

Voltage readings in the NEM are frequently higher than the nominal 230 V, which results in damage to both the network and consumer appliances.[69] The benefit to consumers on energy consumption of reducing voltages closer to 230 V is "tens of dollars per dwelling per annum."[70] The consumer benefit of reducing voltages on appliance life are harder to estimate,[71] though we expect them to be material. The business case for DNSPs to deploy sufficient voltage monitoring equipment in the LV network to report on voltage magnitudes has been historically weak due to the cost.[72] The smart meter rollout, which is occurring anyway, represents an opportunity to acquire this data at low marginal cost, assuming DNSPs can acquire access to this data at low or no cost.[73]

Monitoring LV voltage levels is the first step towards reducing them towards 230 V. You can't solve a problem if you can't see it. This is supported by the clear downward trend in voltage magnitudes observed in Victoria after June 2021 when the Victorian Department of Energy, Environment and Climate Action began direct engagement with DNSPs on voltage, including the ESC introducing voltage compliance performance indicators and Victorian DNSPs being benchmarked on their voltage data in 2022.[74]

[65] NERA Economic Consulting, Valuing load flexibility in the NEM, 2022 p. vii
[66] UTS, Flexible demand – The current state of play in Australia, 2024 p. 9. This utilised modelling from Baringa Partners, Potential network benefits from more efficient DER integration, 2021.
[67] Electric Vehicle Council, Benefits of increased visibility of networks, 2023
[68] AEMC, Residential Electricity Price Trends 2021, 2021 p 4.
[69] MacGill & Passey, Voltage analysis of the LV distribution network in the Australian National Electricity Market, 2020
[70] University of Wollongong Australia, Consumer benefits of improved voltage management, 2024
[71] Ibid.
[72] Ibid.
[73] Under current arrangements in the NEM, DNSPs must pay retailers a fee to access smart meter data outside of Victoria, Ibid.
[74] DEECA, Voltage management in distribution networks, 2023 p. 8

We also expect increased low-voltage network visibility and improved planning to reduce rooftop solar curtailment, including reducing how often Emergency Voltage Management measures need to be taken. This is a material issue because both because it reduces the value that consumers receive from their investment in solar, reducing their confidence and therefore slowing down the energy transition, and because it results in energy being generated by more expensive grid-scale capacity.

While data collection and sharing involve predictable, upfront costs, the potential returns remain largely untapped. The real value lies not just in what we can do with this data today, but in the innovations it will unlock tomorrow. Just as the potential in any new technology is largely unknown at first,[75] so too is data. The power of machine learning continues to grow, unlocking new insights from existing and new data.

These benefits also align with the National Electricity Objective (NEO), ensuring efficient investment in network services for the long-term interests of consumers, particularly regarding price and reliability.

Question 14: Do you agree with the proposed assessment criteria?

ECA notes the assessment criteria AEMC proposes to assess the rule change request against:

- Safety, security and reliability,
- Emissions reduction,
- Principles of market efficiency,
- Implementation considerations, and
- Principles of good regulatory practice.

These criteria all underpin the broader criteria of consumer benefits. According to the Energy Consumer Sentiment Survey, 71% of households surveyed say that having affordable energy prices for all Australians is an important energy-related challenge, with 54% saying it's the most important.[76] It is vital that DNSP costs are efficient and consumer costs for energy are minimised. Additionally, 24% of households say a rapid transition to renewable energy sources is important, and 40% say ensuring Australia's energy system is resilient to extreme weather events to avoid electricity outages is important. Modernising distribution network planning is critical to achieving all these outcomes for consumers. These findings emphasise the need for a distribution network that is not only efficient and affordable but also resilient and future-ready.

[75] Bill Gates famously said "I see little commercial potential for the Internet for at least ten years" in 1994. When Heinrich Hertz discovered radio waves, he said "It's of no use whatsoever." In 1977, Ken Olsen, founder of Digital Equipment Corporation, said "There is no reason anyone would want a computer in their home."

[76] Energy Consumers Australia, Energy Consumer Sentiment Survey June 2024

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