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Daniel Westerman
Chief Executive Officer and Managing Director
Australian Energy Market Operator
Daniel.Westerman@aemo.com.au
CC: ISP@AEMO.com.au

24-28 Campbell St
Sydney NSW 2000
All mail to
GPO Box 4009
Sydney NSW 2001
T +61 2 131 525
ausgrid.com.au

Dear Mr Westerman

Ausgrid submission to AEMO's Draft 2024 ISP

Ausgrid is pleased to provide this submission to the Australian Energy Market Operator (**AEMO**) in response to its Draft 2024 Integrated System Plan (**Draft ISP**).

Ausgrid operates a shared electricity network that powers the homes and businesses of more than four million Australians living and working in an area that covers over 22,000 square kilometres from the Sydney CBD to the Upper Hunter in NSW.

We are focussed on supporting all our customers, both new and existing, through the energy transition at least cost. We are achieving this by facilitating the rapid uptake of customer energy resources (**CER**), electric vehicle charging infrastructure (**EVCI**) supported and enabled by community batteries, and a range of other emerging technologies to support electrification.

We would like to commend AEMO on the Draft 2024 ISP and its leadership in setting a roadmap for the energy transition in the National Electricity Market (**NEM**). We would also like to acknowledge the significant stakeholder consultation conducted by AEMO in the Draft ISP's development and we appreciate the opportunities to engage throughout the process.

Our submission sets out how distribution networks can support the delivery of the energy transition in a faster, lower cost way with a more limited impact on consumers and the environment. This includes through avenues such as the creation of distributed Renewable Energy Zones (**DREZs**), the roll-out of community batteries at scale, the coordination of CER, and the widespread installation of kerbside EVCI.

In finalising the 2024 ISP, we recommend AEMO include:

1. Available hosting capacity on distribution networks and consideration of the role of DREZs as part of identifying the optimal development path to achieve the lowest costs of delivering the energy transition.
2. Consideration of the regulatory changes needed to enable DREZs to be implemented under a streamlined regulatory investment process.
3. Forecasts of community batteries compared to individual behind the meter batteries and an assessment of how community batteries could reduce the need for investment in transmission and generation.
4. Definitions of CER orchestration and the roles and responsibilities of stakeholders within each type of CER orchestration to start establishing how CER can be integrated in a more consistent and co-ordinated way.

5. Further details on the assumptions around future consumption forecasts, including how the impacts of increasing electrification and demand for data centres have been considered in the ISP half-hour demand profiles.

We would welcome the opportunity to discuss our submission further. Please contact Sarah Lau, Energy Policy Manager, at Sarah.Lau@ausgrid.com.au for further details.

Regards



Marc England
Chief Executive Officer

Attachment A: Ausgrid submission to AEMO's Draft 2024 ISP

1. **Distribution networks can support the delivery of the energy transition in a faster, lower cost and less community intensive way than many current alternatives**

The focus of the ISP, to date, has been on the generation, firming and transmission investments needed to support the transition of the NEM to meet future energy needs. The Draft ISP forecasts \$16.4 billion in annualised transmission project costs out to 2050 under the Step Change scenario. As highlighted by AEMO and as the industry has already experienced, this substantial network investment will face cost pressures, social licence issues and workforce and supply chain challenges. These issues are likely to result in longer timelines, higher costs and more complexity and disruption than anticipated. More broadly, it will also be important to ensure the industry has a supportive investment environment to provide the confidence to make the large, long-term investments needed.

While the Draft ISP acknowledges the role of distribution networks in the energy transition, we consider there is scope for the ISP to consider the opportunities distribution networks provide to support the delivery of the transition in a faster and lower cost way, with less risk and a more limited impact on consumers and the environment. Distribution networks are experts in delivering safe and reliable energy infrastructure for the long-term. Distribution networks offer opportunities for targeted energy solutions such as medium scale renewable generation, and storage from community batteries through to grid scale, which can help to both address localised energy needs and support the broader upstream energy system.

Delivering the energy transition faster

One avenue to grasp these opportunities is through the creation of DREZs. These could be in regional areas, such as the Hunter in NSW, or within commercial and industrial zones where solar on the rooftops of warehouses, factories and offices remains underutilised compared to residential buildings. By creating hubs for medium scale generation matched by storage, DREZs offer an opportunity to de-risk and complement larger-scale transmission connected projects currently facing delays.

DREZs can be delivered quickly by leveraging existing distribution network infrastructure. In Ausgrid's case, we also have a large, existing field force that can swiftly pivot to delivering DREZ infrastructure 'in-house' rather than going through the additional steps of procuring labour through an outsourced model like most large-scale transmission projects. Ausgrid is currently considering site options for DREZs and would be pleased to discuss these further with AEMO.

The identification of the optimal development path (**ODP**) for the final 2024 ISP should include available hosting capacity on distribution networks and consideration of the role DREZs can play in supporting new renewable generation, storage and CER developments. We estimate that additional transmission costs approximately \$370,000 per MW of added network capacity.¹ We expect that distribution networks via a DREZ model could add new renewable generation at a significantly lower cost by avoiding large augmentations of the grid in remote locations.

Where this hosting capacity information delineates between existing capacity, and potential capacity under various augmentation scenarios, this would enable potential trade-offs between transmission and distribution network investments to be considered in more detail. This could include opportunities for reduced or delayed transmission investments where faster and lower

¹ AEMO, 2023 Inputs, Assumptions and Scenarios, September 2023

cost investments on the distribution network can be made. This will help to ensure the ISP describes a plan for an energy transition that is delivered in the lowest cost way for customers.

To unlock these opportunities, we would be interested in engaging with AEMO and other energy market bodies about the regulatory changes needed to enable DREZs to be implemented under a streamlined regulatory investment process. This would enable the delivery of new and efficient renewable generation and storage within distribution networks to be fast-tracked. In commercial and industrial zones alone, the University of Technology Sydney estimates that there is 26GW of rooftop solar which could be connected via a DREZ model.²

We note the changing role of distribution networks in the energy transition has also been recognised by the NSW Government, who has committed to requesting electricity network businesses to publish information on hosting capacity to support additional renewable generation as part of its response to its 2023 Electricity Supply and Reliability Check Up.

Recommendation 1 for the 2024 ISP:

AEMO should include available hosting capacity on distribution networks and consideration of the role of DREZs as part of identifying the ODP. If there are data constraints to including DREZs in the ODP modelling, then the potential of renewable energy hubs embedded within distribution networks should be included in the final ISP.

Recommendation 2 for the 2024 ISP:

AEMO and energy market bodies should consider the regulatory changes needed to enable DREZs to be implemented under a streamlined regulatory investment process.

Delivering the energy transition at a lower cost

Storage on distribution networks can also provide additional flexibility to the power system, which can reduce the costs of transmission investments and individual battery storage over the long-term. For example, as outlined further in our submission, our analysis indicates that customers could save up to \$25 billion by 2052, where 50 per cent of the assumed household battery capacity in the Draft ISP is replaced by community batteries.

Regulated distribution networks like Ausgrid also have a lower cost of capital than private providers of community batteries and EVCI, enabling storage and EVCI to be installed at a lower cost for consumers.

As detailed further in our submission, independent analysis has also shown the co-ordination of CER on Ausgrid's network could result in economic benefits of between \$54 million and \$398 million over a 20-year period. We note the Australian Energy Market Commission (**AEMC**) has also recently released modelling indicating up to two billion dollars in net present value could be saved between 2025 and 2050 through the effective integration of virtual power plants (**VPPs**).³

Delivering the energy transition in a less community intensive way

Distribution networks also provide the ability to roll-out storage at our existing sites, resulting in minimal impacts for the community and limited social licence concerns compared to the

² UTS, How much rooftop solar can be installed in Australia, 2019, p.5, link: https://www.cefc.com.au/media/rcalz41c/isf-rooftop-solar-potential-report-final_.pdf

³ IES, 'Benefit analysis of improved integration of unscheduled price-responsive resources into the NEM', 2024, link: [ERC0352 - IES size of the prize benefits modelling-20241502 \(aemc.gov.au\)](https://www.aemc.gov.au/ERC0352-IES-size-of-the-prize-benefits-modelling-20241502)

installation of storage on greenfield sites. For example, we consider over 200 sites across our network could host community batteries. Hosting community batteries at our sites also ensures they can be closely monitored by our expert workforce, limiting any potential safety risks for the broader community.

The installation of EVCI on existing kiosks and poles in Ausgrid's network will also enable charging infrastructure to be installed with less community disruption than other kerbside charging options which would require the excavation of the footpath and reduce footpath accessibility. Chargers installed on kiosks and poles are also far easier to decommission than other kerbside charging options.

2. Community batteries provide opportunities to roll-out storage at scale

The Draft ISP highlights the massive growth in storage capacity needed by 2050 to support variable renewable energy as coal plants retire. Ausgrid's network provides significant opportunities to increase storage capacity through the roll-out of community batteries, which can support the resilience of the power system and enable more consumers to play a role in the energy transition.

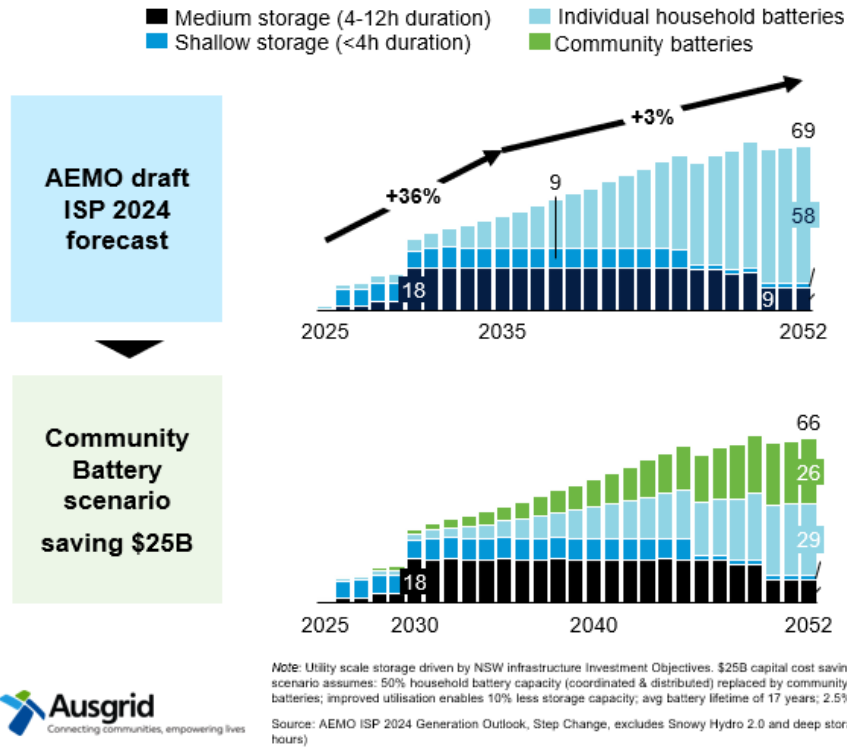
Under Ausgrid's Network Innovation Program, Ausgrid has already rolled out five community batteries at Beacon Hill, Bankstown, Cameron Park, Narara and Cabarita, with four more batteries at Bondi, Cammeray, Warriewood and North Epping to be installed over coming months. Ausgrid's first three community batteries trialled storage-as-a-service in partnership with retailers, which demonstrated that annual bill savings of approximately \$200 per customer can be achieved. Ausgrid is also currently trialling community-based renewable energy projects co-located with the batteries to demonstrate how storage can support greater utilisation of renewable energy and lower cost barriers to electrification.

Ausgrid considers there is potential to substantially expand the roll-out of community batteries across our network over the coming years. Where funding and regulatory barriers are alleviated, our analysis indicates 5MW community batteries could be rolled out to over 200 sites across our network which has the potential to meet over 80% of our customers' expected individual battery demand.

By rolling out these batteries at existing Ausgrid sites, this storage capacity would have limited impacts on the community and the environment, enabling faster implementation than installing storage at greenfield sites. As highlighted in **Figure 1** below, by 2030, this has the potential to result in an additional 1.2GW of storage across Ausgrid's network. Where 50 per cent of the assumed household battery capacity in the Draft ISP is replaced by community batteries, this could save customers up to \$25 billion by 2052.

Figure 1: Potential growth in community batteries

NSW storage capacity (energy) forecast to 2052, GWh



As well as supporting the broader power system, providing customer storage services through community batteries will also enable more residential and business customers who rent or have a limited ability to install their own batteries to benefit from the energy transition and access lower cost renewable energy.

We commend the additional work AEMO has undertaken to provide further detail on future storage needs in the Draft 2024 ISP. We suggest this work could be built on further in the 2024 ISP with detail on forecast community batteries compared to individual behind the meter batteries and an assessment of how community batteries could reduce the need for investment in transmission and generation. This work would support future network and power system planning, including planning for the Federal Government’s Community Batteries for Household Solar program. It would also help to ensure the energy transition is delivered at lowest cost for consumers.

Recommendation 3 for the 2024 ISP:

AEMO should include forecasts of community batteries compared to individual behind the meter batteries and an assessment of the how community batteries could reduce the need for investment in transmission and generation.

3. The growth of customer energy resources requires further implementation consideration

CER provides an opportunity to deliver a lower cost energy transition, as well as positively engage a greater number of households and businesses in the transition. We note AEMO has forecast a four-fold increase in CER from 21GW currently to 86GW by 2050, which highlights the significant potential of this resource.

Ausgrid's network currently has over 250,000 solar installations and an estimated 15,000 behind the meter battery installations. By 2035, this is expected to grow to 570,000 solar installations and 270,000 battery installations, and by 2050 is forecast to reach 900,000 solar installations and 575,000 battery installations. The large forecast growth in battery installations provides opportunities to better manage peak demand, use the network more efficiently, and reduce long term energy costs for consumers. We note this growth may be lower than forecast if more community batteries are installed in place of behind the meter battery installations.

As CER grows, we believe further consideration should be given to how CER will be integrated into the power system to ensure CER's potential is maximised. For example, we suggest the 2024 ISP could include definitions of CER orchestration and the roles and responsibilities of stakeholders within each type of CER orchestration to start establishing how CER can be integrated in a more consistent and co-ordinated way.

Recommendation 4 for the 2024 ISP:

AEMO should include definitions of CER orchestration and the roles and responsibilities of stakeholders within each type of CER orchestration.

We note the need for further details on CER orchestration was also highlighted by the AER in its recent transparency review of the Draft 2024 ISP, particularly as AEMO has indicated that without significant policy changes and increased social licence a high level of orchestration is not possible. We note it is important to distinguish between orchestration that is imposed on customers, for which social license is crucial, and orchestration that is offered as an optional product, with informed consent, and a compelling value proposition. We support efforts to ensure consent is informed, for example through reform of the National Energy Customer Framework. Regarding value, Ausgrid is contributing by innovating our network services to ensure that they are compatible with maximising the value customers can access from markets and network support within retail-led orchestration offerings.

If co-ordinated CER storage is to reach the levels forecast in the ISP – growing to around 50% of dispatchable capacity by 2050 – then significant innovation is required across the industry. To this end, Ausgrid is undertaking a trial with our customers through the world-leading Project Edith to demonstrate how we can unlock CER flexibility and facilitate the efficient participation of CER in the energy market while staying within distribution network capacity limits. These customers, who have opted-into the program, have an agreement for their CER to be orchestrated with retailers or aggregators in VPPs.

To date, 200 customers have been enrolled in Project Edith, with a further 800 customers expected to join the trial in 2024. Initial indications from Project Edith show VPP operators are dynamically responding to the near-real-time price signals by changing how they manage their customers' batteries. The clearest result of this is a shift of their energy exports to the times when they are most valued by the market and the network, as informed by operational forecasts. This action enables more capacity for other customers as rooftop solar and energy electrification grow. Independent analysis calculated economic benefits of between \$54 million and \$398 million over a 20-year period arising from the implementation of Project Edith in the Ausgrid area alone.

We will continue to share learnings from Project Edith across the industry and welcome further discussions with AEMO on how CER could be better co-ordinated across the NEM through AEMO's new DNSP CER Forum.

We also note the Draft ISP forecasts relatively flat residential energy consumption out to 2050 as AEMO considers increases in consumption will be largely offset by investments in rooftop solar and energy efficiency. Ausgrid's peak demand forecast follows similar trends to AEMO however there is significant variation across different parts of our network, resulting in uneven growth patterns.

We are looking forward to exploring household consumption patterns further as part of the AEMO's DNSP CER Forum. This includes factors such as the impact of recent retail energy bill increases on energy volumes and the longer-term trend to greater electrification in the distribution network. We also note the strong growth in load for new and existing data centres, which are undergoing significant expansion in the Ausgrid network as part of our major connections portfolio. We suggest the 2024 ISP include further details on the assumptions around the future consumption forecasts, including how the impacts of increasing electrification and demand for data centres have been considered.

Recommendation 5 for the 2024 ISP:

AEMO should include further details on the assumptions around future consumption forecasts, including how the impacts of increasing electrification and demand for data centres have been considered in the ISP half-hour demand profiles.

4. The roll-out of EV charging infrastructure must be accelerated to support EV take up

The Draft ISP forecasts a significant uptake in EVs, with up to 97% of all vehicles forecast to be EVs under the Step Change scenario by 2050. The Australian Government has taken meaningful steps to ensure this uptake is achieved, including introducing a Fringe Benefits Tax exemption for EVs, the Safer Freight Vehicles Package and progressing a new National Vehicle Emissions Standard.

There are around 33,000 EVs currently in Ausgrid's network. We expect this will grow to 1.2 million by 2035 and over 4 million by 2050. Ausgrid's existing 33,000 EVs represent 55% of total EVs and plug-in hybrids registered in NSW and ACT, with this share expected to remain similar into the future.

However, the take up of EVs will be impeded if customers do not have confidence that they will be able to conveniently charge their vehicles. A recent US study found that 50% of EV customers will purchase an internal combustion engine (ICE) vehicle for their next car, citing lack of infrastructure, range anxiety and EV and energy prices as the key reasons for reverting to ICE vehicles.⁴ This demonstrates that unless the right support and infrastructure is put in place, EV adoption may stall.

While most people will be able to charge at home, an estimated 30% of residents in Ausgrid's network area will struggle to charge at home because they live in terraces, are renting, or live in older apartment buildings that are prohibitively expensive to retrofit. Adequate provision of

⁴ Note, this study excludes Tesla EV owners. <https://electrek.co/2023/10/17/half-of-ev-owners-will-go-back-to-an-ice-vehicle-not-counting-you-tesla-drivers-study/#~:text=After%20purchasing%20an%20electric%20vehicle%2C%20half%20of%20EV,%28no%20surprise%29%20notorious%20for%20their%20fierce%20brand%20loyalty.>

public charging will be essential in ensuring these groups don't miss out on the benefits of the transition to EVs.

For these residents we believe that 'close to home' kerbside charging is the next best option. We are facilitating the roll-out of EV charging infrastructure on Ausgrid assets such as kiosks and poles. As these kinds of installations do not require excavation of the footpath, they can be delivered significantly faster and at less cost and community disruption than other kerbside charging options.

Sixty-three pole-mounted chargers and 25 kiosk-mounted chargers have been installed so far across the Ausgrid network. We are focussing on rolling out 11,000 EV chargers across our network by 2030 to meet the expected customer demand.

We suggest future ISPs, including the 2026 ISP, could consider including forecasts for the EV charging infrastructure needed to meet and support expected EV take up. Ausgrid would be happy to share initial analysis we have undertaken on EVCI needs for our network area with AEMO. We also continue to monitor and consider the impacts of EV charging on our network.