

11 February 2022

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Dear Ms Falcon

Draft 2022 Integrated System Plan

AusNet welcomes the opportunity to make this submission in response to the Australian Energy Market Operator's (AEMO's) Draft 2022 Integrated System Plan (the Draft ISP).

AusNet is the largest diversified energy network business in Victoria and owns and operates over \$11 billion of regulated and contracted assets. It owns and operates three core regulated networks: electricity distribution, gas distribution and the state-wide electricity transmission network, as well as a significant portfolio of contracted energy infrastructure. It also owns and operates energy and technical services businesses (which trade under the name "Mondo").

The Draft ISP has been developed with extensive information gathering, detailed modelling and follows a broader consultation process than previous iterations of the ISP.

AusNet's response focuses on three aspects:

- the adoption of the Step Change scenario as 'most-likely';
- the Draft Optimal Development Path (Draft ODP) itself; and
- other aspects of planning for future of the NEM, including distribution-level planning to enable growth in role of distributed energy resources (DER), and thoughts on Renewable Energy Zone (REZ) planning processes including REZ Design Reports.

Adoption of Step Change scenario as most-likely path for National Electricity Market (NEM) welcome.

AusNet welcomes the adoption of the Step Change scenario as the most-likely scenario for the 2022 ISP. The approach is consistent with the balance of stakeholder feedback, with the adoption of net-zero commitments by Federal and State Governments, and with growing international investor and policy momentum for emissions reduction.

Recent evidence from the NEM also supports the case that the NEM is on a more rapid transformation trajectory than was reflected in the Central Case scenario that had been assumed most-likely in earlier ISPs. This includes trends in the connection of DER, and the contribution of large-scale renewables to the overall energy supply mix.

Adoption of Step Change as the central scenario rightly focuses attention on the action that is needed to meet the energy transition and Australian and State and Territory emissions reduction

targets. This includes critical transmission projects and distribution network programs to ensure the NEM continues to deliver safe, reliable and affordable energy to Australians throughout the energy transformation.

Draft Optimal Development Path could be improved upon with greater attention to matters affecting social licence for energy transformation as well as completion of other supporting analysis.

The Draft ODP meets the ISP's input requirements (such as meeting forecast demand, reliability standards and jurisdictional renewables targets) and identifies the best transmission development options from an economic perspective, but points to some important limitations on the analysis.

Social licence for energy transformation is increasingly recognised as the key to ensuring projects can be delivered, and the arbiter of the success of the ISP. The ability to deliver on the Plan and to meet future energy needs hinges on communities accepting large scale energy projects such as new wind and solar farms, and new transmission lines, and on the willingness of homes and businesses to enrol their distributed energy resources in virtual power plants (VPPs) or other forms of DER coordination.

AusNet considers the ISP can do more to actively consider issues beyond power system and economic modelling in its planning decisions, and better reflect matters affecting social licence in the early stages of its analysis. In the absence of this analysis a narrower set of candidate development pathways can emerge that do not align with key environmental and land planning requirements or with the project merits and challenges facing communities who host energy infrastructure. This can be difficult to unpick through subsequent consultation.

Options include: conducting preliminary land use assessments to apply an early measure of feasibility to all major transmission projects included as options for the ODP; publication of digestible information on the benefits and need for projects on the ODP to support engagement with local communities; and, establishing a community advisory body to give focus to local perspectives throughout the ISP development process.

In addition to placing greater attention on social licence, confidence in the ODP would be supported by further analysis about the credible risks facing actionable ISP projects (e.g. regulatory approvals, planning approvals, supply chain challenges), and its resilience to extreme weather events.

The Victorian outcomes in the Draft ISP show limited addition of new generation and, as coal plants close over the next decade, a reliance on importing energy from new and existing interconnectors. This vision for Victoria's energy future is a significant departure from the state's historical net energy surplus and appears to place critical dependence a small number of key transmission elements, and on the timely delivery of both Marinus Link and VNI-West. A risk analysis is warranted to ensure Victorian energy supplies are resilient to credible delays in either project, or consider other mitigations that can be put in place (e.g. additional generation or storage planted in Victorian REZs). AusNet would also like to see broader analysis of how resilient the proposed grid is to factors such as bushfires, storms and other extreme weather events that could foreseeably result in outages or significant constraints on key assets.

Other aspects of planning for the future of the NEM needed.

Beyond the development of the ODP, the ISP was intended to provide a guiding role for the overall energy system, and its publication prompts an opportunity to identify emerging challenges or areas for further work. More detailed planning for DER and REZs will be necessary to support the roles of both in future years.

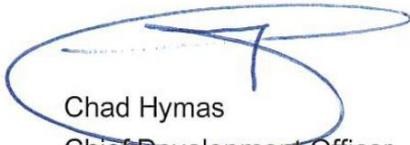
The material contribution of DER to the future energy system is a central feature of the Step Change scenario. This highlights a need for the ISP to go beyond the task of national transmission planning.

The sizeable role of distributed generation and storage is transformational and upending many norms of how the NEM was designed and continues to be operated. As the NEM is rapidly passing through the level of DER uptake that can be passively absorbed without risking disruptions to markets, or reliability and system security, more work is needed to ensure forecast DER uptake can be accommodated. AusNet is participating in and welcomes the work that has commenced toward inclusion of greater consideration of DER impacts including interactions between distribution and transmission.

REZ planning frameworks such as the REZ Design Report process or the NSW REZ Network Authorisation process can help to de-risk the planning and delivery of REZ infrastructure. There remain questions about how these processes can be effectively prepared and integrated within each jurisdiction, given broader transmission reforms being considered by NEM institutions, TNSPs and jurisdictional governments. Also, consideration is needed into how planning for discrete REZs addresses interactions that will occur between REZs. For instance, Victoria's relatively small geographical footprint lends itself to reports being prepared for adjacent REZs, where there may be opportunities to identify augmentation options that optimise benefits across zones.

If you have any questions regarding this submission, please contact Jason Jina, Energy Policy Lead by email at jason.jina@ausnetservices.com.au.

Yours sincerely



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AusNet

AusNet submission to the Australian Energy Market Operator (AEMO)

Response to the Draft 2022 ISP

11 February 2022

1. Introduction

AusNet Services Limited (**AusNet**) is pleased to provide this response to the AEMO's Draft 2022 ISP published in December 2021.

Our response covers three aspects:

#	Section	Sub-section
2	The adoption of the Step Change scenario as most likely	<ul style="list-style-type: none"> - Why AusNet supports the Step Change scenario (Section 2.1) - Recent evidence to support the Step Change scenario (Section 2.2)
3	Response to the Draft 2022 Optimal Development Path	<ul style="list-style-type: none"> - Opportunities for the ISP to actively consider social and environmental feasibility in its planning decisions (Section 3.1) - Opportunities to improve the ODP through selection of candidate pathways (Section 3.2) - Need to further consider the credible risks facing actionable ISP projects and their potential impact on the ODP (Section 3.3) - Case to further test the draft ODP for reliability and resilience risks in Victoria (Section 3.4) - AusNet is currently preparing a nodal model assessment for Victoria (Section 3.5)
4	Other aspects of planning for the future of the NEM	<ul style="list-style-type: none"> - Growing need for more distribution-level planning associated with the forecast reliance on distributed energy resources (DER) (Section 4.1) - Thoughts on REZ planning processes, including REZ Design Reports (Section 4.2)

2. The adoption of the Step Change scenario as most likely

2.1 Adoption of the Step Change scenario as the most likely reflects stakeholder feedback, net-zero emissions policy commitments, and will enable better planning for the needs of the energy transition in the NEM

The Step Change scenario is a material shift from the previous ISP's central scenario. It predicts that market, financial and operating forces will pressure the owners of coal generation to bring forward retirement plans rather than reach the end of their technical life such that ~14 GW of capacity will be withdrawn by 2030 rather than the currently announced ~5 GW.

It also predicts two and a half times more utility scale variable renewable energy (VRE) required by 2040 than previously projected (i.e. ~80 GW rather than 33 GW) and the adoption of DER will be far greater than previously anticipated. For example, distributed PV systems will produce 90 TWh of electricity by 2050 rather than 47 TWh.

AusNet welcomes the adoption of the Step Change scenario as the 'most likely' scenario in the Draft ISP as:

- **The scenario reflects stakeholder feedback** – The latest ISP has undertaken a more consultative approach, engaging with industry through the IASR and ISP Methodology process, consumers through the ISP Consumer Panel and AER via its transparency reviews. This change in scenario reflects the level of consultation undertaken.
- **There are strong policy and investor signals to support greater emissions reduction** – A commitment to economy-wide net-zero emission by 2050 from Australian, State and Territory governments, and growing pressure from our international partners to decarbonise present strong signals that Australia's electricity system will decarbonise. Those in the sector, are increasingly aware that environmental, social and governance (ESG) practices are critical to their customers and investors.

- **Recent evidence supports the Step Change as the most accurate representation of our operating environment** – Recent AEMO data shows several VRE records were achieved in the last quarter of 2021 and suggests they will continue to grow. Evidence supporting the Step Change scenario's view on grid-scale VRE and DER is provided in Section 2.2.
- **Adoption of the Step Change scenario focusses attention on action that is needed to facilitate the energy transformation and meet domestic emissions reduction targets** – Coal-fired generation currently supplies over 70% of demand in Victoria. Developing a plan to facilitate the generation required to replace our retiring coal fleet and meet our domestic and emissions reduction targets is prudent.

In addition, the Step Change scenario's forecast levels of DER capacity underscore the pace of change and need to rapidly develop solutions to address key barriers. Further views on this topic are provided in Section 4.1.

2.2 Recent evidence supports case for Step Change scenario

Forecast levels of VRE are supported by recent market outcomes

The Step Change scenario materially increases the pace of the energy transformation and urgency of new transmission investment to meet expectations around the future energy system compared to the Central Case scenario in the 2020 ISP.

The decision to adopt a more rapid transition trajectory is supported by recent market outcomes about the connection of DER and contribution of large-scale renewables to the overall energy supply mix. For example, AEMO's latest Quarterly Energy Dynamics report shows several VRE records were achieved in the last quarter of 2021. This includes the highest NEM average renewable share of total generation (34.9% of total generation during the quarter, up significantly from 31.6% on the previous quarter). It also includes the highest instantaneous renewable share of total generation on record (61.8% of total NEM generation on 15 November 2021, marginally up from 61.4% on the previous quarter) and grid-scale solar output (over 4.4 GW on 24 December 2021, 560 MW higher than the previous record set in the previous quarter).

AEMO's generation information data suggests VRE records will continue with 4.2 GW of additional grid-scale VRE committed and more than 90 GW proposed according to its February 2022 update.

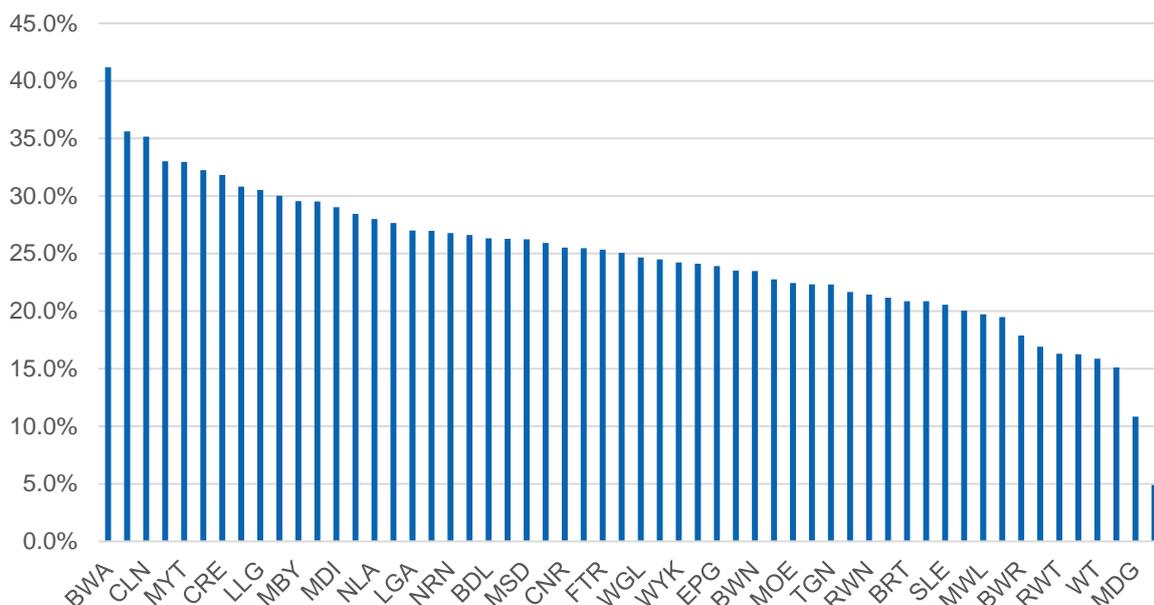
Forecast levels of DER are high but not implausible based on trends

The Draft ISP's Step Change scenario forecasts 65% of detached homes will have rooftop PV and reaching 69 GW capacity of electricity by 2050, up from 15 GW today. It also forecasts significant amounts of storage is required and much of the transport sector is electrified, with 60% of all vehicles expected to be battery EVs by 2050.

While significantly higher than saturation rates AusNet has historically assumed, it is not implausible that the NEM could reach AEMO's solar PV forecasts. Evidence continues to build in areas with highest levels of solar penetration, that growth in solar PV continues and saturation has not been reached. Solar PV systems have also been increasing in size. Solar PV forecasts have repeatedly underestimated the pace of growth.

Figure 1 below provides a view of AusNet's current PV penetration levels by zone substation. It shows how AusNet has already reached around 35-40% solar PV penetration in some areas.

Figure 1: Residential rooftop PV penetration by AusNet zone substation



Source: AusNet

The capacity of residential solar PV on our distribution network has grown by around 70 MW per annum from a total of 175 MW in 2011 to 890 MW in 2021. In the same period, the average PV penetration for residential areas has risen from less than 7% to 24% across our network. Subject to export constraints, these solar PV penetration levels are expected to rise further.

Clyde North zone substation in Victoria's south-east is a strong case study for the speed at which solar PV uptake can increase in growth corridors (where there are less barriers to solar PV installation). In 2018, just over 20% of customers had rooftop PV. By 2021 this number jumped to 35%.

AusNet also accepts the Draft ISP's battery EV uptake numbers as a conservative forecast. This acknowledges that while the CSIRO analysis supporting the Draft ISP consider a range of relevant factors there are several critical unknowns which make it difficult to accurately predict uptake (e.g. material monthly changes to actual market demand, uncertainty about future demand/supply conditions and policy incentives). Further, international precedent from the US and Europe suggest adoption rates are likely to increase significantly and then accelerate onwards once the market conditions reach an 'inflection point.'

3. Response to the Draft 2022 Optimal Development Path

The Draft ODP meets the ISP's output criteria and input requirements (such as meeting forecast demand, reliability standards and jurisdictional renewables targets) and identifies the best transmission development options from an economic including testing for a range of sensitivities, but points to some important limitations on the analysis.

While acknowledging the complexity of the AEMO's analytical task in determining the ODP and the need to make some simplifying assumptions in the analysis, AusNet sees several areas where the ODP needs further review to ensure it is feasible to deliver and will provide for an electricity grid that is resilient to the rapid energy transformation that is underway. There are also opportunities to improve inputs to the analysis, such as through more active consideration of social and environmental feasibility of projects.

3.1 The 2022 ISP must do more to actively consider the social and environmental feasibility of its planning decisions

The Draft ISP calls for jurisdictional governments to work together with NEM participants to, amongst other things, accelerate engagement with communities, consolidate an integrated approach to land use planning and align appropriate compensation mechanisms.

AusNet supports the ISP's recognition that securing social licence for investment in VRE, storage and transmission at this scale is critical to a successful transformation and acknowledge an industry-wide effort is required.

Social licence for energy transformation is increasingly recognised as the key to ensuring projects can be delivered, and the arbiter of the success of the ISP. The ability to deliver on the Plan hinges on communities accepting large scale energy projects such as new wind and solar farms, and new transmission lines, and on the willingness of homes and businesses to enrol their distributed energy resources in virtual power plants (VPPs) or other forms of DER coordination.

However, more can be done to reflect matters affecting social licence in the development of the ISP. Without consideration of these issues in the ISP, a narrower set of candidate development pathways can emerge that do not align with key environmental and land planning requirements or with the project merits and challenges to the communities that would host them. This can be difficult to unpick through subsequent consultation (e.g. through the RIT-T process).

As a high-profile whole of system plan about what generation and transmission infrastructure is required by when and where it should be located, the ISP holds the attention of a wide range of stakeholders. The inclusion of projects on an "optimal" development path bestows a perception that the project's feasibility has been evaluated from a number of lenses (e.g. technical, economic, social and environment costs) and is seen as acceptable to stakeholders.

The use of the word 'optimal' suggests the characteristics of projects on the development pathway (e.g. the project's preferred solution, route corridors, technical design features) have had – at least at a high level – an assessment of social and environmental feasibility.

Some projects included in the Draft ISP will likely be met by concern by stakeholders, especially those in regional communities who would bear the localised impacts of large-scale energy infrastructure but do not see these non-technical costs reflected in the ISP's planning decisions.

Opportunities for the ISP to actively consider social and environmental feasibility in its planning decisions

AusNet considers the ISP can do more to actively consider issues beyond power system and economic modelling in its planning decisions. Specifically, the AEMO has an opportunity to:

Ensure the projects included in the ISP (e.g. route corridors, solutions) have been screened for major social, cultural and environmental constraints.

AusNet suggests the AEMO conduct (or commission) a preliminary land use and non-technical constraint mapping exercise to quantify a truer cost of a particular project option. This analysis would better capture major social, cultural and environmental barriers that parties delivering these projects could face. The AEMO could use this information on deliverability constraints to remove a transmission option or amend its location, cost envelope or commissioning date.

Shape public attitudes on the energy transformation along with the need for VRE and transmission.

In some cases, the ISP will be the first time some stakeholders are aware a REZ or ISP project is being explored in their community. This may bring questions about why new energy infrastructure is needed and how it may impact their day to day lives. The inclusion of digestible content on the benefits and need for these projects as part of a once-in-a-century energy transformation would help inform community dialog around plans and options involving their communities.

Capture views of communities who are likely to bear the localised impact of projects on the ODP.

AusNet sees benefits in the AEMO establishing a community advisory body to provide a focus on community perspectives throughout the ISP development process, similar to the recently established ISP Consumer Panel (although with broader representation). Community support is critical to energy infrastructure being delivered on time and their voices should be heard as part of the process. It also allows detailed community engagement activities to be conducted as part of the REZ Design Report process (see Section 3.3 below).

3.2 Further opportunities exist to improve ODP through selection of candidate development pathways

The ISP would benefit from testing a broader set of network projects and credible augmentation options as inputs to the development of the ODP. AusNet has identified the following issues with identified Victorian network projects:

- **Alternative solutions could deliver greater benefits to Victorian consumers.**

AusNet is concerned that the set of options being fed into the analysis is too narrow, and that superior solutions may exist that are not currently being considered. This may have the effect of predetermining the ODP, or limiting potential benefits (e.g. there appears to be a presumption toward expansion of existing easements over greenfield options, although we expect in some cases greenfield projects could be easier to achieve necessary planning and environmental approvals).

For example, VNI West is planned to run adjacent to existing easements from North Ballarat to Kerang however based on some preliminary constraints mapping conducted for AusNet this option looks challenging. AusNet considers that developing a corridor further west would avoid areas of high constraint and provides potential for connection of greater amounts of renewable generation, leading to greater benefits from the investment.¹

The 2022 ISP should provide commentary on how it has defined the available project options and why it has deemed certain options the best solutions available. We would also appreciate information on how future ISPs intend to leverage the REZ Design Reports process to better inform its investigation of project options. Further comments on the preparation of REZ Design Reports are provided below.

- **No prospect for offshore wind despite market signals to contrary.**

The Draft ISP does not forecast any offshore wind development in Victoria under any of its scenarios on the basis that economics are yet to be proven.

Further commentary about the level of cost reductions required for offshore wind to feature prominently in future ISPs would be helpful. Recent market and Victorian Government announcements suggest Victorian offshore wind is perhaps more economic than suggested in the ISP. Offshore wind could also play an important role in maintaining Victoria's supply adequacy by mitigating the risk of onshore generation, storage and transmission developments not progressing within the timeframes required.

3.3 It would be prudent to further consider the credible risks facing actionable ISP projects and their potential impact on the ODP

The adoption of the Step Change scenario increases the urgency of new transmission investment and indicates there is very little (if any) time between when actionable ISP projects are due to be commissioned and required.

Very little information is provided about whether the timeframes to reach the ODP commissioning dates are reasonable given known and credible risks in the transmission planning and delivery process. For example, risks associated with regulatory approvals, cost recovery, obtaining statutory planning and environmental approvals, acquiring land and easements, and managing supply chains. At present, the only actionable ISP project for which a credible risk is identified is Marinus Link.

With input from relevant jurisdictional planning bodies, it would be prudent to:

- Provide high level information about the development timelines of each actionable ISP project, such as the expected completion of regulatory approvals, preliminary works, detailed design, planning approvals, construction and commissioning.
- Identify and then assess the likelihood and consequence of credible risks to each actionable ISP project;

¹ AusNet has previously raised similar concerns in its response to the VNI-West Project Specification Consultation Report. In this specific example, AusNet's concerns remain under investigation, and it is therefore too early to conclude whether they have been appropriately addressed.

- Provide commentary on potential mitigations to credible risks over a defined threshold within the risk assessment; and
- Consider expected changes to the ODP if projects are unlikely to proceed due to one or more credible risks.

The consequences of not delivering a specific transmission project on time (or at all) depends on a variety of factors including changes in demand, the availability of unconstrained supply elsewhere in the system and occurrence of major events (e.g. extreme weather).

However, given the speed of the energy transformation and scale of transmission projects required under the ODP, it is possible that delays to actionable ISP projects could impact the price, reliability and security of electricity for customers in a particular jurisdiction (or across the NEM).

The potential for these outcomes provides a strong impetus for the AEMO to further consider credible risks facing actionable ISP projects in the final ISP.

3.4 Outlook for Victoria under draft ODP must be tested for resilience to extreme weather events and other foreseeable risks

A reliable and resilient power system is essential to a functioning economy. Outages or load shedding can result in lost productivity, revenue and poor living conditions.

Victoria is expected to switch from a net-exporter to a material net-importer as brown coal starts to retire.

The Step Change scenario forecasts a change to historical generation flows across the NEM. Victoria's brown coal is largely being replaced by renewables in New South Wales and Tasmania.

In 2021 Victoria exported approximately 10% of energy production, however under the ODP, as brown coal retires net-production is expected to fall, with Victoria becoming a net importer by 2028.² By 2032 Victoria will require imports exceeding 30% of its energy needs, with this level of import required for the rest of the modelled period (e.g. out to 2050).

This vision for Victoria's energy future is a significant departure from the state's historical net energy surplus and appears to place critical dependence a small number of key transmission elements, and on the timely delivery of both Marinus Link and VNI-West. A risk analysis is warranted to ensure Victorian energy supplies are resilient to credible delays in either project, or consider other mitigations that can be put in place (e.g. additional generation or storage planted in Victorian REZs).

Further investigation is required into whether Victorian reliability can be maintained by the ODP

The Draft ISP proposes Marinus Link is commissioned in two stages in 2029 and 2031, and VNI West is commissioned in 2031. This leaves open a question about whether Victorian generation, storage and interconnection is sufficient to ensure power system reliability during the late 2020s and early 2030s, particularly given the coal retirement and concurrent growth in demand.

In 2032 all Victorian coal is expected to retire, replaced by only an additional 15 TWh of Victorian grid-scale VRE (much less than the 33 TWh per annum, currently supplied from coal), despite increasing demand. This leaves Victoria dependent on its interconnector transmission corridors as approximately 30% of Victorian demand must be met from imports.

Given the Victorian reliability shortfalls projected by 2028 in the 2021 Electricity Statement of Opportunities (ESOO), there are likely to be significant consequences if a non-credible contingency occurred on one of these corridors during a high demand day in the late 2020s. Given the extent of reliance on interconnection to supply Victorian demand, AusNet considers this to be an important risk assessment.

² AusNet has derived Victorian net interregional flows, based on AEMO's published operational consumption and net production, as this information was not directly available. Annual Consumption from forecasting.aemo.com.au, Publication: ISP 2022, Version 17/12/21, Category: Operational (sent-out), Region: Victoria, Scenario: Step Change.

Annual Production from Draft 2022 ISP generation outlooks, Step change scenario, Case Summary: CDP10, Generation by year: Victoria.

AusNet recommends that AEMO publish net-interregional energy flows and undertake high impact low probability assessments of contingencies affecting the Victorian interconnectors and associated transmission corridors to ensure Victorian reliability is maintained during the Step Change being planned for. Additional generation planted in Victorian REZ's would also alleviate this risk.

Given the 2021 ESOO identified a reliability breach for Victoria as soon as Yallourn retires, and the Step Change scenario predicts coal retirement to occur much sooner and to a much larger extent than 2021 ESOO's assumptions, AusNet would like to see updated analysis of the Victorian reliability outlook.

There is also value in testing whether Victoria is sufficiently resilient under the ODP, particularly as the frequency of extreme weather events increases

AusNet supports comments in the Draft ISP recognising the increasing complexity to preserve resilience against extreme weather events and climate impacts (e.g. storms, bushfires, heatwaves, extreme wind or solar droughts). We also support AEMO's commitment to include analysis on this topic in the final ISP, including case studies that demonstrate whether some candidate development paths are more resilient to extreme weather events than others.

Scheduling of transmission and generation outages is already proving increasingly problematic in Victoria, particularly on the bulk transmission system. This suggests that the occurrence of forced outages during extreme weather events could lead to reliability shortfalls.

With climate change driving more extreme weather events and Victoria set to be a net importer of energy throughout the ISP's forecast period, AusNet is concerned that power system resilience could deteriorate further, increasing the occurrences of market intervention and load shedding in Victoria.

There is a need to consider whether Victoria's energy infrastructure enables us to see through these conditions and maintain resilience to consumers through the energy transformation.

The AEMO should consider whether the Draft ISP is appropriately planning for correlated risks for key assets and non-credible events, particularly as the effects of climate change becoming increasingly prominent.

3.5 AusNet is currently preparing a nodal model assessment for Victoria

While the complexity of the analytical task undertaken to develop the ISP necessitates some simplification, the speed of the transformation anticipated under the Step Change scenario suggests the need to test whether important dynamics are being missed.

AusNet is currently preparing a Victorian transmission roadmap which uses a granular nodal model. This analysis will test the impact that the simplifying assumption of the ISP's regional-reference-node approach to modelling may be having on the preferred development path for Victorian transmission and generation.

The roadmap's vision is for a socially responsible Victorian transmission network which enables a rapid and sustainable transition from coal to renewables while maintaining energy security, reliability, and affordability for Victorian consumers.

AusNet considers the roadmap to be a critical component in securing Victoria's energy needs in a rapidly changing environment and looks forward to providing insights to government, industry, and the market on the future of the Victorian energy ecosystem.

4. Other aspects of planning for the future of the NEM

Beyond the development of the ODP, the ISP was intended to provide a guiding role for the overall energy system, and its publication prompts an opportunity to identify emerging challenges or areas for further work. More detailed planning for DER and REZs will be necessary to support the roles of both in future years.

The Draft ISP has flagged the intent to include more consideration of the impacts of DER, and particularly the associated implications for distribution planning and interactions between distribution and transmission systems in the 2024 Plan. This is a critical area of work to progress given the large role for DER that is forecast.

It also sought feedback on whether REZ Design Reports are warranted for the indicated REZs. This raises further questions about how these reports and/or other REZ planning frameworks can be effectively prepared and integrated within each jurisdiction, given broader transmission reforms being considered by NEM institutions, TNSPs and jurisdictional governments.

4.1 Distributed energy resources to play a transformational role in energy system, highlighting the importance of industry action to understand impacts and integrate DER

The material contribution of DER to the future energy system is a central feature of the Step Change scenario. The growth of distributed generation and storage is transformational and upending many norms of how the NEM was designed and continues to be operated. As the NEM is rapidly passing through the level of DER uptake that can be passively absorbed without risking disruptions to markets, or reliability and system security, more work is needed to ensure forecast DER uptake can be accommodated.

Step Change scenario for DER underscores pace of change and need to rapidly develop solutions to key barriers

A key energy system risk for DER is that reforms, technical and market developments needed to integrate DER fail to keep pace with DER uptake.

The Draft ISP assumes all DER generation can be exported into the distribution network. The Step Change scenario also forecasts widespread uptake of distributed storage, and a significant role for coordinated distributed storage (e.g. VPPs), which is expected to provide almost three quarters of dispatchable capacity by 2050.

Across the NEM, existing levels of solar PV are already generating challenges to legacy systems and approaches. Minimum demand is falling rapidly, and unevenly, with some zone substations frequently exhibiting reverse flows. AusNet's own distribution network has already experienced operating as a net exporter³, due in large part to distributed solar, but with a contribution from distribution connected utility-scale generation. Currently, networks are mostly still reliant on static solar export constraints and asset upgrades to manage situations where system limits (e.g. thermal or capacity) are reached.

While work is underway to solve these challenges from integrating higher volumes of DER, it will take time until they can be fully utilised. It would be sensible to look at the alignment of AEMO's forecasts for DER with the expected delivery timeframes for these solutions in more detail.

The Draft ISP calls out need for DER social licence to facilitate the required levels of coordinated DER storage and demand response. There is also a lot that needs to be better understood in terms of the network needs to integrate the forecast levels of DER. For instance, more information is needed on the impacts on sub-transmission and the interaction between distribution and transmission systems as the importance of distributed storage grows.

AusNet is participating in and welcomes the work that has commenced toward inclusion of greater consideration of DER impacts in the 2024 ISP.

4.2 REZ planning processes could provide low-cost approach to de-risk transmission investment, however their implementation needs further consideration

AusNet supports processes which help de-risk the planning and delivery of REZ infrastructure, although there remains a lack of clarity around how these arrangements will align with broader reform initiatives underway

Over the last few years there have been multiple large ISP projects facing a difficult path to commissioning. These difficulties are the result of credible risks in the transmission planning and delivery process – see Section 3.3.

³ Occurred on 28 November 2021.

Importantly, REZ planning frameworks such as the REZ Design Report process or the NSW REZ Network Authorisation process can help de-risk the planning and delivery of network infrastructure by undertaking activities much earlier than is currently the case.

More specifically, AusNet would like to see these processes used as a low-cost approach to:

- Allow jurisdictional planning bodies to prosecute a broad range of barriers (technical, economic, social, environmental, cultural) to developing transmission infrastructure within a REZ.
- Enable subsequent ISP's to be informed by better quality inputs, such as information about the benefits and credible risks facing projects on the ODP or that could inform the development of superior solutions.
- Improve the accuracy of information informing specific project planning decisions within the RIT-T (e.g. likely land acquisition costs of pursuing a project across a particular corridor).

However, REZ planning frameworks are only one part of the solution to deliver coordinated transmission and generation investment in the NEM. They sit alongside other reform initiatives being considered by NEM institutions, TNSPs and jurisdictional governments (e.g. connection and transmission planning reform, contestability ownership outside of Victoria, cost-allocation and access reform). For example, the NSW Government's Electricity Infrastructure Roadmap and Victorian Government's REZ Development Plan.

This raises questions about how REZ planning frameworks will integrate or align with these broader reforms, particularly given they are at varying stages of development. We encourage the AEMO use the ISP to highlight the further work needed to clarify how the REZ Design Report process will be applied in each jurisdiction.

In Victoria, there are benefits to REZ Design Reports considering the interplay between adjacent REZs rather than preparing these reports in isolation as a discrete planning activity.

AusNet supports the ISP's preliminary view which suggests REZ Design Reports are required for both the Murray River REZ (V2) and the Southwest Victoria REZ (V4).

The Murray River REZ includes the proposed VNI West project, which for reasons established in Section 3.1 is critical to Victoria's energy resilience and reliability. As an area, Murray River REZ has strong solar potential, which is at present severely constrained by limited transmission capacity on the existing network. VNI West would upgrade transfer capacity in the region to realise this VRE potential.

While the Southwest Victoria REZ includes the proposed 500 kV single-circuit REZ Expansion Project between Mortlake and Sydenham, which is set for development in the early 2030s.

However, Victoria's relatively small geographical footprint lends itself to adjacent REZs being assessed together. Considering these zones individually risks the Optimal Development Path only considering the discrete benefits of each REZ in isolation rather than optimising for benefits that could accrue from investment across these zones.

For example, Western Victoria REZ (V3) sits directly between V2 and V4. At present the ISP does not intend for the jurisdictional planning body to prepare a REZ Design Report for V3 as there is no further investment to facilitate renewable development in this region on the Optimal Development Path beyond the Western Victorian Transmission Project.

Considering V2 and V4 in isolation of each other and V3 risks the placement of renewable development not being optimised to consider options available across the whole eastern side of the state. As a result, a narrower set of benefits may be identified (e.g. only considering benefits of additional VRE back to the Melbourne demand centre). Taking a more detailed look across these REZs may identify augmentation options that deliver benefits across these zones and promote a plan that leverages more granular analysis (e.g. an integrated network where low cost VRE in Victoria's eastern region providing diversity of resources that benefit both itself and other NEM jurisdictions).

Parties responsible for the first set of REZ Design Reports should take time to consider how they can effectively be prepared. This includes considering new approaches taken for unregulated transmission projects.

In preparing a REZ Design Report jurisdictional planning bodies are required to meet certain design principles and parameters. These requirements have deliberately been left quite broad in the rules to provide flexibility in their preparation to allow for differences in jurisdictional processes.

It is likely that the energy sector will experience a maturity process around how best to prepare REZ Design Reports.

As developer of unregulated transmission projects, AusNet has been actively refining its transmission infrastructure planning and delivery approach. Below are some key features of our approach:

- **Detailed analysis of areas suitable for energy infrastructure** (e.g. conducting detailed land-use analysis, reviewing competing local or state planning priorities such as those identified in master precinct plans which are not considered in the RIT-T).
- **Actively engaging with a broad range of local stakeholders to capture their views on living and working with energy infrastructure and how wider economic benefits can be maximised before developing a detailed project concept design and assessing potential corridors.**
- **Identifying material risks that may emerge through the EES process and consider appropriate mitigations** (e.g. engagement with traditional owner groups and native title risk).

While not bound by the same regulatory requirements, AEMO and jurisdictional planning bodies may find elements of this approach useful when considering how REZ Design Reports should be prepared.