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Submitted by email to ISP@aemo.com.au

2022 DRAFT INTEGRATED SYSTEM PLAN

Dear Nicola

Thank you for providing an opportunity to comment on the Australian Energy Market Operator's (AEMO) 2022 Draft Integrated System Plan (ISP).

Energy Consumers Australia is the national voice of residential and small business energy consumers. Like AEMO, we acknowledge that Australia is experiencing a "highly complex, once-in-a-century transformation" and we applaud your team for the hard work and genuine spirit of consultation through which they have identified a development path that aims to optimise consumer benefits. Energy Consumers Australia believes that if we – as a community – appropriately navigate the energy transition, it will take us from a 'top-down' centralized electricity system to one that is also more decentralised, more community-based, and more responsive to the needs and voices of consumers (as both users and producers). Given that belief, we have several concerns with the direction of the Draft ISP, which we detail in this submission.

Our concern arises from the Draft ISP taking an asymmetrical approach to the identification of development opportunities, options, and risks. It effectively treats the low-voltage, distribution, consumer side of the system as an input to determine what are the opportunities for the investment in and construction of large-scale transmission and power plants, and then expounds about the risks to that plan. Such an approach is not "integrated," and it fails to meet the ambition of National Electricity Rules (NER) 5.22.2 and the development of a whole of system plan.

While our comments focus primarily on what we hope are helpful suggestions to improve the balance of attention placed on the consumer side of the energy system, and we also want to affirm the comments of the AEMO ISP Consumer Panel. Like the Consumer Panel, Energy Consumers Australia thinks the Draft ISP currently lacks sufficient evidence and reasons for assumptions made of consumer risk preferences. Similarly, we also recommend AEMO support consumer stakeholders to engage in targeted risk assessments on key consumer topics prior to the publication of the Final ISP to further inform risk preferences.

Our primary recommendation is to improve the final 2022 ISP by identifying "demand-side" risks along with narratives proposing approaches to address them, as AEMO has done for "supply-side" risks. Furthermore, the ISP should aim to consider "development options" within the entirety of the energy system -- including the ability of energy efficiency and consumer hot water storage, batteries, and other forms of flexible use to avoid or defer the need for large-scale infrastructure. We discuss some opportunities for doing so below. To reiterate this point another way, the Draft ISP assumes a demand side that largely continues to operate much as it did historically when generation overwhelmingly relied on baseload coal and gas peaking supply, and ignores the policy settings and interventions that are under active development to shape and shift demand and address affordability.

We conclude our submission with a comment on the many things that this Draft ISP does well.

Identifying risks associated with over-forecasting operational demand

The Draft ISP notes that the "Draft Optimal Development Plan (ODP) is robust against the range of policy and input assumptions contemplated by the ISP scenarios." While the ISP has quantified and considered a range of policy and consumer possibilities that are reflected in different demand assumptions, it is inaccurate to say that the Draft ODP is robust against these.

Only one of the scenarios analysed in the Draft ISP demonstrates meaningful negative demand growth along the lines of what has been demonstrated in the NEM over the last ten years. The weighting produced by the Delphi Panel gives this scenario only a 4% weighting – less than a quarter of the weighting produced for the Hydrogen Superpower scenario which envisages a level of demand growth unprecedented in the modern history of Australia's electricity system.

Table 1-NEM Consumption Growth (Actuals vs. Scenarios)

Actuals			Scenarios				
				Hydrogen Superpower	Step Change	Progressive Change	Slow Growth
Year	**Annual Rate of Change**		**Year**	**Annual Rate of Change**			
2012	-2.1%						
2013	-2.3%		2023	-0.54%	0.62%	-1.80%	-3.81%
2014	-2.3%		2024	0.44%	0.68%	-1.32%	-1.83%
2015	-0.3%		2025	0.29%	-0.67%	-0.92%	-1.14%
2016	1.8%		2026	1.89%	0.70%	0.02%	-0.84%
2017	-0.6%		2027	5.72%	0.71%	0.49%	-0.42%
2018	0.1%		2028	9.59%	0.32%	0.73%	-2.42%
2019	-0.3%		2029	10.28%	0.02%	0.81%	0.03%
2020	-1.5%		2030	3.64%	0.21%	0.54%	-11.06%
2021	-1.7%		2031	5.97%	1.43%	0.89%	0.58%
Average	**-0.9%**		**Average**	**4.14%**	**0.45%**	**-0.06%**	**-2.32%**
			Weighted Average (Delphi Panel)		**0.82%**		

Table 1 uses ISP/AEMO data on Annual NEM-wide Operational Consumption energy to calculate the annual rate of change in total system demand – excluding energy generated on-site via small-scale solar.

As Table 1 shows from 2011-2021, the average annual rate of change in load was -0.9% -- in other words, on average over the last ten years, total consumption across the NEM has dropped roughly 1% per year.

By comparison, only one of the four scenarios (Slow Growth) analysed by the ISP includes a meaningful reduction in "sent out" load during the actionable period. Progressive change effectively assumes load stays constant during the actionable period, while Step Change and Hydrogen Superpower see sizeable – and unbelievably large – load growth, respectively. Applying the Delphi Panel weightings to the scenarios – which assume there is 1/3 chance of seeing a negligible or negative load growth future and a 2/3 chance of seeing a sizeable or enormous load growth future – leads to an average rate of change of more than 0.8% during the actionable period.

In summary, Table 1 demonstrates that the ISP assumes the next ten years will not look like the last ten years – in nearly all futures, the ISP assumes a large growth in load. The obvious question is, what if that demand growth does not eventuate? Is the Draft ODP robust against such scenarios?

Table 11 in the ISP includes the net market benefits for each Candidate Development Path (CDP) for each scenario and the Delphi Panel weighted average net market benefits. Simple spreadsheet analysis of this information suggests that different weightings of the scenarios would lead to materially different ODPs. Energy Consumers Australia manipulated Table 11 to see which CDP would create the most net market benefits if different scenario weightings were applied. The results suggest that even as "Staged Projects" both Hume Link and VNI West are questionable investments.

Equally weighing all four scenarios (25% probability to each) identifies CDP 5 (building New England Renewable Energy Zone (REZ), Sydney Ring and Marinus Link) as the most net beneficial approach. Reversing the Delphi weighting – 4% probability for Hydrogen Superpower, 29% for Step Change, 50% for Progressive Change and 17% for Slow Growth – identifies the same optimal CDP as removing the Hydrogen Superpower scenario altogether and giving the remaining three scenarios equal (33%) weightings: the most beneficial path is to only move ahead with any costs now for the New England REZ and the Sydney Ring.

In other words, analysis suggests that the ODP is not robust against lower demand growth scenarios. Accordingly, the ISP should more clearly state the risk associated with the load growth assumptions baked into the scenarios – and particularly the Delphi Panel weighted average.

It is worth noting that the ISP does identify the risk associated with uncurtailed export of small-scale solar, batteries, and electric vehicles from the distribution system. Unfortunately, the ISP inaccurately groups this risk under the inartful heading, "Securing social license for DER". (With more than 3 million Australian households now owning rooftop solar, there is strong social license for distributed energy resources (DER) that are owned and managed by consumers. The social license issue most often discussed with DER is related to minimum demand and the real or perceived need to actively control consumers energy devices, for the purposes of system security. This risk might be better labelled, "Demonstrating the system security benefits of controlled DER to consumers".

The ISP thankfully notes that a group of Distribution Network Service Providers (DNSPs) and AEMO will "collaborate to better understand how developments in the distribution network interact with the transmission network and ultimately support incorporating DNSP planning inputs into the ISP in a way that optimises benefits for consumers." This risk could perhaps be better labelled as "Forecasting of distribution system curtailment," and should continue to be identified and mitigated.

In addition to this risk, the need to demonstrate the value of controlled DER to consumers, and the overarching risk of demand growth, the ISP should also clearly identify at least the following "demand-side" risks:

- The rate and pace of residential building electrification, noting that the Step Change scenario assumes a 13.3% annual growth rate in electrification consumption from 2024-2031 moving from 479 GWh in 2022 to 4,161 GWh in 2031
- The rate and pace of commercial building electrification, noting the Step Change scenario assumes a 7.8% annual growth rate in electrification consumption from 2024-2031 moving from 11,000 GWh in 2022 to more than 30,000 GWh in 2031
- The rate and pace of residential and business energy efficiency, noting that efficiency grows at 15% and 18% annually in each sector, respectively, in the Step Change scenario meeting a combined 23,000 GWh annually in 2031 compared to less than 4,500 GWh in 2022.
- The rate and pace of electric vehicle adoption and growth, noting that electric vehicle load grows from less than 100 GWh in 2022 to more than 9,000 GWh in 2031 in the Step Change scenario with an annual growth rate of 71% from 2024-31.

Discussing ways to mitigate (or at least address) whole of system risks

The Draft notes that, "The ISP methodology accounts, as far as is possible, for a range of quantifiable risks." Simply accounting for or quantifying risk is not particularly effective risk management. Indeed, Energy Consumers Australia applauds AEMO for having the foresight and leadership to identify – and often propose mitigating actions for – "Risks to timely implementation of the Draft ODP network projects". For example, AEMO states that "Networks, developers, and governments will need to engage with local communities to ensure the coordinated development of VRE and enabling network, both connection assets and shared transmission network augmentations."

The ISP should include similar commentary on the "risks to timely development of demand side forecasts". These risks – some of which have been identified above -- likewise require interventions from and between governments, market actors, community stakeholders and consumers to mitigate their impacts.

In other words, if the ISP is a plan for investing billions of dollars to address risks associated with a meteoric rise in electricity usage from residential and business consumers, shouldn't the ISP also discuss the interventions required for such usage profiles to eventuate or the risks of following the ODP if they do not?

For example, in commentary about a risk labelled "Realising significant residential and commercial building electrification," the ISP could state that the timeliness of consumer investments in large-scale transmission infrastructure depends upon 13% and 8% annual load growth from residential and commercial building electrification, respectively, in the next ten years. Such load growth is largely dependent upon an agreed future on the long-term viability of the gas distribution network. Gas and electric networks, governments, and the building community need to engage with residential and business consumers to ensure the viability of significant increases in building electrification.

Similar commentary could be imagined for the other demand side risks above. Avoiding such discussions would continue the asymmetrical treatment of the supply and demand sides of the electricity system. Energy Consumers Australia would be happy to work with AEMO to contemplate, identify and suggest potential mitigations for "demand side" risks more thoroughly in the final ISP.

Challenges and Opportunities for Developing an Integrated and Whole of System Plan

We note that taking a truly integrated and whole of system approach is difficult – and in certain ways outside of AEMO's remit. Given Energy Consumers Australia's interests in consumers and their increasing levels of investment in active energy infrastructure, meeting the ambition of the ISP's stated purpose of a "whole of system" and "integrated" plan that effectively incorporates consumer behaviour – including and especially investment behaviour – is of the utmost importance to Energy Consumers Australia.

Globally, most integrated resource plans or integrated system plans treat the distribution system and consumer uses of energy as givens, just as the Draft ISP does. In all such plans, assumptions about DER adoption and battery and vehicle behaviour and overall demand for electricity vary by scenario; these assumptions are inputs into the model, rather than seen as outputs that can be actively shaped by policymakers and electricity system stakeholders. The de facto analysis tools AEMO – and most of the global industry – uses are focused on developing and analysing transmission system plans.

Furthermore, effectively identifying opportunities in the low-voltage "demand-side" of the energy system requires much greater visibility of the distribution system than AEMO – and indeed most Australian DNSPs – have. Energy Consumers Australia's view is that improving distribution network visibility and planning is critical and best prosecuted by the DNSPs themselves; it is largely their assets that enable or restrict the distribution of electricity throughout the local system. The AEMO and DNSP working group focused on improving forecasting of distribution system management is a step in the right direction, though there is a concern that networks lack the clear direction in the NER to provide such visibility to AEMO for the ISP or to anyone, for that matter. For this and other reasons we see the need to accelerate the resolution of roles and responsibilities for system operation, that has been deferred in the Energy Security Board's consideration of integration of large-scale generation and transmission and a distribution system with high levels of distributed generation.

Recent AER guidance drafted and promulgated to realise the AEMC's Access and Pricing Rule Change requires or encourages networks to identify "basic export levels" and export tariff levels, which may provide similar insight to what the AEMO might require for the ISP. A coordinated, well-researched NEM-wide approach to identification of the distribution system's ability to host rooftop solar, batteries, electric vehicles and other consumer energy resources would be very welcome and provide consumers with additional value from the on-going planning occurring in the NEM by AEMO and DNSPs alike.

Another potential avenue for improving the ISP and helping it come closer to the ambition of a whole of system plan is the identification of development opportunities for consumer and shared energy resources, such as (front of the meter) storage. The ISP today identifies a system need and then looks at various large-scale supply options for meeting that need. An improved ISP might crack open those disparate processes and imagine ways for consumers or those focused on the low-voltage network to provide additional value to consumers and the system.

The first step would be to state the system needs more clearly that eventuate from the closure of existing fossil power plants and expected load growth. What generating capacity and energy is needed? Where? By when? While the ISP has no doubt identified these concrete system needs, it fails to articulate them in a way that would enable the whole system to provide opportunities for meeting them.

A series of rebates, for example, to insulate homes and businesses might be a more cost-effective way to meet various capacity and energy needs than supply side resources. While such an approach might not completely avoid the need for new transmission and the large-scale storage and generation that will connect to it, it may defer the need for several years leading to lower overall costs for consumers. A truly integrated and whole of system plan needs to explore and identify development opportunities throughout the electricity system, not only in the bulk transmission system. The ISP forecasts energy efficiency and demand flexibility as ways of alleviating system needs but makes no case for a plan for achieving these opportunities.

In this sense, the Draft ISP represents an Integrated System Vision and a Bulk Supply System Plan. By stretching the risk identification and mitigation section of the Final ISP (Section 7 in the Draft ISP) to comprehensively include the demand-side and the various risks to achieving the forecasts embedded in most scenarios and the Delphi Panel weighted average, AEMO could come closer to realizing an integrated and whole of system plan. Further work in the 2024 ISP and beyond will be required to realise the ambition of NER 5.22.2 and a whole of system plan.

Conclusion

This submission has focused on areas for improving the ISP, but we would be remiss if we did not mention the many things the ISP does well. The ISP remains the apex of effective engagement and consultation in Australia's energy transition. The ISP likewise is a continually improving product – the Draft 2022 Plan was much better than the 2020 Plan and no doubt the 2024 Plan will be better still. Most importantly, perhaps, the ISP represents a NEM-wide plan that attempts to fairly compare the various strengths and weakness of the existing and planned electricity system. As jurisdictions continue to aim to meet non-energy goals, such as regional development, through targeted energy sector interventions (often paid for by energy consumers) the importance of the ISP has only increased as the most transparent and consultative avenue for best discussing balanced approaches for meeting the needs of consumers throughout the NEM.

We continue to appreciate the opportunity to engage with AEMO in their work, including on the Draft ISP. Should you have any question son this submission, please contact Brian Spak (brian.spak@energyconsumersaustralia.com.au).

Yours sincerely,

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