AEMO Draft 2023 IASR
Issues Register 2023
(Energetic Communities Association Incorporated (ECAI))

Report sections	Section/Issue	Comments and Considerations	Recommendation or options
General	**Purpose**		
		● *Double Whole-of-system plan for energy and soon transport* ● *Informs policymakers, investors, consumers, researchers and other energy stakeholders* ● *Serves regulatory purpose of justifying actionable and future new transmission* ● *Maximises value to end consumers* ● *Optimal development plan/roadmap*	
	Missing from the document	● What's the problem statement? ● Climate change impacts, resilience, adaptation nationally and internationally ● Geopolitical context such as global economy, trade wars, wars etc…	
	Scenarios		
	Scenario drivers, breadth, usefulness, and plausibility	● The scenario's boundaries are too narrow. The geopolitical context is considered in a limited way through international climate agreements, and fossil fuel prices. ● The major uncertainties impacting the NEM identified are: health and evolution of the whole Australian economy, the pace of the transition to net-zero emissions, CER, costs, and new technologies. ● Wars are not considered though they have a major impact, whether the Ukraine war continues/escalates, or China invades Taiwan would have a major impact on Australia, its economy and the available decarbonisation pathways. ● If Australia remains too slow on transitioning to green manufacturing, when a carbon price is imposed at the border of the EU, the USA, or China, Australia's exports could become uncompetitive. ● It cannot be assumed that climate action correlates with economic growth, as suggested in the 4 scenarios. We can decarbonise and moderate, stop, or reverse growth. These are all value choices and potential outcomes with or	● How the geopolitical context is going to play is anyone's guess, but that's the purpose of doing scenarios. What are the plausible paths taking into a breadth of international factors? ● Scenarios could include: ○ The major uncertainties identified, including numerous international drivers, and deeper exploration of the international context.

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		without economic growth. That is, even with economic growth, we need deliberate policies and programs for decarbonisation and improved equity. ● Global and national economic growth can nonetheless be import drivers and influence the transition. In these scenarios, global or national recession are not considered, nor the potential for different type growth, where care and services become the motor of the economy rather than extractive industry and manufacturing. ● War and the COVID-19 pandemic have impacted fossil fuel prices and availability, adding volatility and uncertainty in the short, medium and long-term due to supply chain disruption. We have seen super-profits, but also demand destruction. In the near future, such crises will most likely be compounded by weather extremes, social unrest, resource depletion, volatile international relations etc… ● No scenario includes an acceleration of climate change with its associated extreme weather events and their consequences on Australia's economy and the global economy. ○ For temperature only, AEMO adjusts historical weather outcomes to apply in future years based on the outcomes projected by forecast climate models. ○ The increasing rate of climate change means these forecast models may be inaccurate ● No scenario explores strong climate resilience building or the consequences of not doing it. ● Planetary boundaries do not seem to be considered, particularly in high and moderate economic growth scenarios. The growth relies on unlimited resources, where the only limiting factor is the capacity to extract through supply chains, or on technologies that are either unknown or far from ready. ● A separate 1.5°C scenario is required that focuses purely on the full decarbonisation of our domestic economy (i.e. not relying on gas). Actual decarbonisation driven by greater renewables and storage build sooner, with high levels of electrification, tightly coupled with significantly improved	○ Would any of the scenarios hold if China invaded Taiwan? Considering that this is not a remote possibility, at least one scenario ought to imagine what this could be like. ○ Climate resilience building in the energy system needs to become a strong focus of all major planning and investment efforts. ○ Planetary boundaries are a central constraint to the transition, we do not have unlimited resources to extract. ○ Economic recession and a different type of growth should be explored. ○ Future climates file, regularly updated, beyond temperature, to include risk of flooding, fire, high winds, etc… ○ For demand forecast, felt temperature is more appropriate than just temperature.

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		industrial, commercial and residential energy performance economy-wide (including energy efficiency and demand side participation).	
	Scenario distinctness	The scenarios represent possible pathways. However, as illustrated in *Figure 2 the Four pillars of decarbonisation, and their utilisation by scenario* (2023 IASR p.43), the scenario distribution is broadly concentric, meaning from Progressive Change to Green Energy Export, the four pillars utilisation simply increases. The same could be said about economic growth, whereby it seems to increase from Progressive Change to Green Energy Export. This is not a diversity of pathways; it is the same pathway with progressive ambition in the use of each of the four pillars.	More distinct scenarios through a range of pathways where an uneven focus is given to the 4 pillars in between scenarios.
	Internally consistent scenarios	● Consistency means that the logic behind the parameters adopted in the scenarios remains consistent all the way to the end of the scenario, unless otherwise stated. The scenarios are used to explore an idea to its end. And some of those scenarios if explored to their genuine end are unsustainable, meaning they lead to resource exhaustion before the end of the century. ● The scenarios lack consistency on various aspects such as energy efficiency and economic growth. For example, high growth relying on extractive industries is not compatible with planetary boundaries and will lead to resource depletion, inflation and potential recession.	
	Gas	● We acknowledge that gas will need to play a part in the earlier years, however we do not support such a strong focus on gas whether it is fossil, hydrogen, or biogas in the ISP. ● Issues related to converting to hydrogen are not adequately addressed, such as infrastructure and appliance upgrades.	
	Four pillars	● The scenarios use the Four pillars of decarbonisation (*Figure 2 Four pillars of decarbonisation, and utilisation by scenario)*, i.e. energy efficiency, electricity sector decarbonisation, fuel switching, and carbon offsets. They are internally confusing as the electricity sector decarbonisation pillar would in fact include energy efficiency, electrification, fuel switching and offsets.	● Reassess what the decarbonisation categories are and keep them consistent throughout. ● Suggestions of categories: Carbon sequestration and offsets; Doing things better

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		● Table 11 Key assumptions and outcomes from the multi-sectoral modelling include Electrification, Energy efficiency, carbon sequestration, and fuel switching. ○ As such, the 4 categories between the pillar and Table 11 are not consistent. Table 11 and subsequent sections conflate carbon offsets with carbon sequestration. Figure 2 states that the Fuel switching pillar equals fuel switching and electrification, but Table 11 separates them. ● Those categories do not include all the categories within the National Energy Performance Strategy (NEPS), such as demand response.	or differently (inc. demand side solutions in the NEPS), Doing new things (inc. innovation to come of both business models and technology), Not doing the things at all (inc. energy conservation, walking vs driving, etc… AKA negawatts) ● Modelling a future with decreasing reliance on offsets, for example, would be useful.
	Risk of under or over investment	● Because of the shortcomings of the scenario as presented above, there are existing and significant potential risks that may not be captured, including but not limited to: ○ Hydrogen and biogas not playing as significant role ○ Not earning social licence around community expectations (especially around actual emission reductions and decarbonisation) ○ Inaccurate assumptions around state-based energy efficiency programs leaving generation or cost gaps	● Make the risks, their cause and consequences explicit for each scenario
2.2	Delphi Panel	● ECAI is pleased to see this be used again to rate the plausibility of scenarios. ● The Delphi panel technique allowed: ○ anonymity of panel of experts ○ rating the scenarios ○ offering written reasons for those ratings, and ○ considered the responses of others to revise their ratings if appropriate. ○ some consumer representation	● Provide high level information on who's represented on the Delphi panel - gas, coal, renewables, transport, commercial/industrial energy users, residential consumer advocates? ●

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		● While anonymity is valued as part of the process, there could be some clarity regarding the organisations, experience or sub sector being represented - more resolution than government, generator, network, consumer or other.	
	1.5°C Green Energy Exports		
2.2.1	Limiting to 1.5 degrees	● The only scenario that is considered to be in line with global efforts to cap average global warming at 1.5°C, and doing our fair share. ● The scenario fails to adequately model how Australia will take responsibility for the Scope 3 emissions embodied in exports like iron ore and bauxite by processing them with renewable power and renewable hydrogen.	We need a variety of pathways to limit global temperature increase below 1.5oC. That means a variety of scenarios that could plausibly produce this outcome.
	Gas as the transition fuel is a risky proposition	● The scenario relies heavily on biogas and hydrogen, explicitly including fossil hydrogen (so-called 'grey' and 'blue' hydrogen), than it does on energy efficiency and electrification to stay aligned with a 1.5°C goal. ● This scenario doesn't appear to model the cost of gas network upgrades(for hydrogen), let alone plant and other machinery upgrades - which would be both wildly expensive and inadvisable - it seems inherently implausible. ● This pathway is unlikely to win social licence and will lead to greater costs to low-income households	This scenario is implausible.
	Internal consistency	● Considering that an electricity supply chain reliant on hydrogen of any colour is less energy efficient than one relying mostly on solar, wind or hydro, how is the 1.5°C Green Energy Exports scenario showing the highest energy efficiency uptake. ● Highest electrification and high hydrogen use is not consistent within the 1.5°C Green Energy Exports scenario. Are we electrifying or changing a gas for a gas? It may be more appropriate to have low- and high-hydrogen scenarios. ● Unlimited Hydrogen blending in the gas network is not energy efficient, nor cost-efficient compared to electrification. Where electrification is not the answer, co-location of hydrogen production with users is more cost-efficient than converting the whole methane gas network to hydrogen.	● This scenario significant internal inconsistencies and omissions are numerous, it is not plausible. ● Include analysis of the climate forcing of hydrogen from this scenario

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		● The scenario has the strongest emission reduction, however it neglects to take into account the Global Warming Potential of Hydrogen and its greater potential to escape/leak to the atmosphere (fugitive emissions).[1] Hydrogen leakage, which is a significant known risk for this small molecule is not considered. ● While hydrogen has a short atmospheric lifetime, transition to hydrogen will be rapid at the same time we need rapid decarbonisation. ● It cannot plausibly limit global temperature increase below 1.5oC.	
2.4	Hydrogen use	● This scenario assumes unlimited blending of hydrogen. ● We support the development of the hydrogen industry, but only for hard to abate/electrify end use. ● It seems highly improbable that hydrogen will replace gas in households considering the cost of the fuel itself, the cost of the infrastructure to transport it and the doubling up of service charges as households. Scenarios are for probable futures, household hydrogen for cooking or heating is not one of them.	A scenario with hydrogen without such strong focus on energy export is plausible and requires exploration.
	Hydrogen export	Hydrogen export may play a role in Australia's future economy. There are large uncertainties as to the timing, size, location, ownership etc… of this export industry. The scenario assumes a significant amount (50% of exported hydrogen) is produced with grid-connected electrolysers. ● An industry relying on electrolysers dedicated to the production of exported hydrogen will require significant augmentation of the grid, paid by all Australians, and will only benefit a few. This is not equitable nor affordable. ● There is no social licence to do such a thing.	Large hydrogen exports have huge uncertainty, this needs to be taken into account.
		The excessive reliance of carbon sequestration in the 1.5oC scenario is technically not feasible and demonstrates the level of electrification required.	Either increase the electrification and reduce the reliance of sequestration, or run a second more ambitious 1.5oC scenario.

[1] https://acp.copernicus.org/articles/22/9349/2022/

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	1.8°C Orchestrated Step Change		
2.2.2	1.5oC	● This scenario should be consistent with 1.5oC. It is an electrification scenario. ● It appears more likely than the hydrogen scenario (where we attempt to decarbonise whilst at the time creating huge energy demand for hydrogen export). ● There are a number of policy settings that could get us to where we need (i.e. below 1.5oC of warming). It is likely better to have several 1.5oC scenarios, than two 1.8oC scenarios. ● We need to see how we get to 1.5oC without the unrealistic assumptions in the Green Energy Exports scenario	Align this scenario with 1.5oC
	Energy efficiency	● Considered a big part to achieve it - “energy efficiency is as important as electrification” ● We need significantly more well thought out and planned jurisdictional programs for energy efficiency. ● QLD is significantly lacking in policies targeting energy efficiency which may render this scenario implausible at the outset. This puts QLD households at risk of increased electricity, gas bills as there is little support for energy efficiency by the QLD government.	● Clarify that without strong energy policies implementation this scenario will not eventuate. ● Include a scenario where energy efficiency does not eventuate, as it is likely that the best case will not occur.
	1.8°C Diverse Step Change		
2.2.3	1.8oC	It does not seem plausible that this scenario would reach 1.8oC, as that would require governments interventions and strong policies.	Greater clarity will be needed around assumptions driving and realising the use of green gases
	Biogas	This scenario sees demand for biogas increase dramatically with the assumption that explicit biogas targets are put in place by state and territory governments (a "7.5% blending target for reticulated gas by 2030 and 10% by 2035"). This is not plausible. There is no sign of such strong policy, environmental or social support for biogas. Such a policy is unlikely to get social licence.	Biogas growth should be commensurate with current interest for it, at least in the near future.

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	2.6°C Progressive Change		
2.2.4	The worst-case scenario	The scenario is premised on the total failure of multilateral international efforts to limit global temperature increase in line with the Paris Agreement. This means this scenario should incorporate the impact of far more extreme weather on the stability of the grid. The 2.6oC is not so relevant. We need to keep all temperature increase targets below 2.0C and aim for 1.5oC. These scenarios are to help us understand how to get there.	To be plausible, climate impacts need to be taken into account and commensurate with global climate action and climate resilience building efforts.
		● This scenario should be used to clearly communicate the cost of weak, delayed or non-existent policy for multisectoral decarbonisation, still accounting for current policy pipeline. ● While we have a renewed focus on decarbonisation, and legislated action, this does not guarantee they won't be removed by future governments. Assuming 43% emission reduction and net-zero by 2050 do not support the scenario description and purpose.	This scenario needs to be a worst-case scenario, where we genuinely pay the price of our shortcomings.
	Poor supply chains and staff	● It is possible that other nations with stronger decarbonisation policies and programs out-compete Australia, and Australia misses out on staff, training and/or investment, and we can't import or manufacture the good we need.	● This scenario could be adapted to model the possibility of failed supply chains, imports, training, staffing or local manufacturing.
	Targets		
3.2.1	General	● AEMO suggests that scenarios have been aligned to the International Energy Agency's (IEA's) World Energy Outlook (WEO). ● In comparing to the proposed 2024 ISP scenarios given in the IASR, it is unclear how they translate (noting the IASR states which proposed ISP scenarios relate to which WEO scenarios)	Clarify how the ISP scenarios reflect the WEO scenarios, i.e. clarify to what extent they represent the WEO scenarios and where they differ
	General	● All scenarios assume the emissions reduction stipulated in the Climate Change Act (2022) is at least achieved.	Maintaining a high level of agility of the ISP development process will determine the

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		● We understand that these are net-zero targets, and therefore require offsets. Energetic Communities would be interested in targets that minimise offsets to 5% being modelled. ● Commonwealth and all state NEM jurisdictions have seen rapid development of policies regarding climate change and energy. The ambition of these are likely to increase, with national targets reported as required in our updated 5 year Nationally Declared Contribution (NDC) of the Paris Agreement. States are also likely to increase ambition and the Federal Government increases ambition. ● The geopolitical context is also fast evolving e.g. war, pandemic, climate impacts…	relevance of the Final document.
	1.5oC	● Only one scenario reaches 1.5oC and it is not plausible. ● Having only one 1.5oC scenario misses the opportunities of the scenario process of analysing different 1.5 degree pathways, including social and economic impacts, impacts on social licence and potential policy developments, and the investment pathways required.	Develop more scenarios that are plausible and consistent with limiting global average temperature increase to 1.5oC.
	QLD targets insufficient and unclear how it will be met	● Target not legislated, while it is in some other states. It is difficult to model without the security of knowing Queensland is reaching its target. ● QLD has lower ambition than many other states ● The Energy and Job Plan as well as the Regional Energy Transformation Partnerships Framework could have a great impact on how Queensland targets will be reached. ○ current actions within the Energy and Jobs plan are unlikely to achieve their targets until after 2030	Take note of potential updated and improved ambition by the Queensland government over the next months.
	Climate Change		
	Climate Targets	● Scenarios do not appear to include the cost of climate inaction or of failing to maintain average global temperature increase below 1.5oC. ● 1.5oC has not been reached yet, current climate impacts are posing challenges for the grid and worsening.	Take into account climate change related plausible extreme weather and their impacts.

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	Energy Efficiency	● Considering the multiple constraints influencing the transition, energy efficiency will be an essential component of any pathway to decarbonisation. This is reflected by all proposed scenarios including energy efficiency. ● The IASR mentions current energy efficiency programs across the NEM, and proposes to keep up to date as new programs are enacted. ● Housing energy efficiency needs to be prioritised, specifically for low-income and all renters, as it is an equity and resilience issue. ● As industry, business and homes electrify, energy efficiency must make a significant contribution to electrification policies and programs. ● Energy efficiency also reduces peak demand – poor quality housing (usually lived in by low-income households, whether renting or owned), means that use of active cooling during summer peaks is more intensive as coolth is lost through the building fabric. ● Poor housing energy efficiency has a cost for the power system, for consumers and the health system (as poor housing energy efficiency has been linked to poor health outcomes and costs)	● Include or demonstrate how current jurisdictional energy efficiency programs compare with the energy efficiency targets within each scenario. The ISP could be a call for action on energy efficiency. ● Transitioning to energy efficient housing needs to be considered in the same way as the electrification of transportation. How fast we transition new housing and current housing stock to net-zero energy, will arguably have an impact similar on the power system than the EV transition.
	Climate change impact resilience and adaptation	● Climate impacts were only considered through the impact of temperature increase. Only considering temperature fails to account for the variety in which climate change will affect the power system, such as floods or fire. ● Investment decisions taken without considering the impact of climate change runs the risk of being vulnerable to it. ● In the same way that not planning for climate mitigation makes for a disorderly transition with consequences for all power system stakeholders, not planning for climate change impacts makes for increased cost in recovery rather than a fraction of the cost in preparedness.	● Integrate resilience and climate adaptation throughout the ISP beyond temperature to consider all hazards. ● Provide forecasts of cost of preparedness to climate change and contrast it with recovery cost.

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			● Include within scenarios ranges of climate change impact on the system.
	Queensland is vulnerable	● Over the last few years Queenslanders in particular have already had to cope with the natural disasters of drought, floods and bushfires, while residents in poorer quality housing have suffered heat impacts. ● In terms of climate and economic risk, Queensland is recognised as the state most vulnerable to climate change in Australia, including the economic costs of social impacts of climate change[2] (see Chart ii on page 12 in footnote link).	
	Grid outages		
	Widespread and long duration grid outages (WALDO)	● As climate change impacts increase, outages due to infrastructure failure will increase. ● Building climate resilience is not within the IASR, however this is part of the remit of ISP.	● Take into account climate change impact on outages ● Include the cost of WALDO to the economy ● Include climate resilience building effort and cost savings from prevented outages
	Communities		
	Social License		
	Community representation	● An Advisory Council on Social Licence consisting of representatives from Academia, NGO, First Nation, Energy user groups and networks has been established to investigate social licence. It is very important to engage with local communities as early as possible, in the planning stage. ● This was also a big issue with the recent QREZ Benefit Sharing[3] and Technical Paper[4] processes, including regarding cultural heritage, land use planning and	● Include and liaise with community representatives as soon as possible in the planning, beyond the single consumer advocates session (February 9th).

[2] http://australianbusinessroundtable.com.au/assets/documents/Report%20-%20Social%20costs/Report%20-%20The%20economic%20cost%20of%20the%20social%20impact%20of%20natural%20disasters.pdf

[3] https://yoursayhpw.engagementhq.com/about-qrez-consultation

[4] https://yoursayhpw.engagementhq.com/qrez-technical-paper

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		environmental impacts. It may be worth AEMO reviewing submissions to those processes. ● Our concern here is consumer advocates and community groups are significantly under-resourced to participate in the ISP process, in terms of technical knowledge, capacity to commit adequate time.	● AEMO to produce short educational videos accessible to the public on topics in relation to the IASR and ISP, such as scenario development, electrification, demand side participation, social license, nature protection, and how green gas and hydrogen are considered, for example.
	REZ	● The REZ's within the ISP are vague locations, however, or because of this vagueness, there is a potential that local communities would start worrying and organising prior to any consultation or engagement with them. Communities have seen processes where, by the time they saw the actual plans, they only were invited to perfunctory consultations. History is not much on the side of big infrastructure projects in terms of social licence.	● When communicating about the ISP REZs' locations and the infrastructure attached to them, it is important to take into account how it may be perceived by the affected communities.
	Sensitivity in the IASR	● Social licence could be the main cause for delays and/or cancellations of projects, adding great uncertainty to any scenario. ● The explanation of the Social Licence sensitivity is confusing. ● It seems to only apply to REZ for generation and transmission. ● Social licence is not acquired or lost linearly. ● Some projects, right now, do not have a social licence	● The whole ISP needs social licence for its processes and outcomes as well all technologies and their deployment. ● A scenario where social licence cancels 50% or more of the renewable generation or transmission projects seems plausible and worthy of exploration.
	Consumers		

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	Consumer engagement	● Few consumer advocates from Queensland are actively involved in the ISP, and those that are, do not necessarily have the ongoing capacity to remain engaged throughout this important process. ● Jurisdictions need to be supported in different ways – some states have greater consumer advocacy resources (but all are limited). ● Resourcing consumer advocates is an ongoing issue. Energy Consumers Australia provide some funds, as do some state departments. ● We acknowledge the role of the ISP Consumer Panel, but their process also requires significant contribution from the advocate community who need to maintain currency with ISP related publications and processes.	● Establish jurisdictional level resources for consumer advocates to participate throughout the ISP process, perhaps along the lines of network customer councils, with sitting fees etc.
	Community energy	● In the form of community generation, islandable or stand-alone microgrids are not mentioned in the scenarios. ● Stand-alone microgrids present a risk of desertion from the NEM, this could become increasingly likely as no significant climate adaptation or resilience is taking place, or climate mitigation remains slow. Fringe of grid desertion might be a suitable option. However, in most other locations, it could have significant impacts. ● Islandable microgrids could be a great opportunity for the broader network as controllable DER, grid service providers, reduced need for transmission, and overall grid resilience.	● Integrate microgrid in future scenarios, particularly when addressing resilience issues
	Modelling Inputs and Assumptions		
	Limitations	The model has limitations, like all models. Such as the fact, the model selects the path of least cost. There are many areas of the transition where economic rationality will only play a small part.	Make modelling limitations explicit
	Climate and weather	● Future climate and weather is not taken into account as only historical data is used to forecast demand, weather dependent generation (wind, solar, hydro) ● Only 1 to 2 weather stations per state are used to model consumption, minimum and maximum demand forecasts. For example, in Queensland, the Archerfield Airport data is used for the whole of Queensland, even though Queensland encompasses 4 distinct climate zones.	● Future climate and weather for various RCP is available, should be used, and regularly updated ● One weather station per climate zone might provide

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			better weather data, where historical data is needed.
3.13.2	Manufacturing	● Scenarios will need to be updated to ensure it reflects and supports opportunities in domestic manufacturing, including electrification of rail, high speed rail manufacturing, and funding through the Powering the Regions Fund and the National Reconstruction Fund.	● Modelling should reflect low-high growth ambition of Australian manufacturing in scenarios.