



Our Conversation

Integrated System Plan

Stakeholder Webinar | 11th February 2020

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Following the release of the draft Integrated System Plan in late 2019, AMEO ran a series of stakeholder engagement workshops across Brisbane, Sydney and Melbourne to foster industry engagement, gather industry feedback and to help shape the areas that could be further explored ahead of the final release.

A further webinar was held to engage with those who couldn't make the in-person sessions but wanted a chance to ask questions.

These notes capture the conversation from the two-hour session, including the questions that were asked.

- Provide an opportunity to ask questions and improve your understanding of the ISP process and outcomes
- Involve participants in the ISP process by requesting feedback and input to prioritisation of scope for the Final 2020 ISP

Objectives of today



Want to contribute? Head to [Sli.do](#) and join event #ISP

Introducing the ISP	5mins
Process	
Strategic outcomes	
Meet the modellers	60mins
Resource Outlook	
REZ, Renewable Integration & Network	
Prioritisation	15mins
Final Q&A	20mins
Wrap up	

Agenda



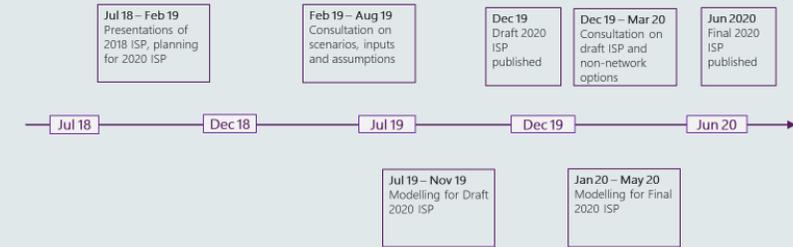
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Welcome

Natasha Sinclair
Principal Analyst / ISP Stakeholder Engagement



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Consultation close dates:
 - Draft 2020 ISP :21 February 2020
 - Non-network options for QNI medium/VNI west: 13 March 2020

Our timeline



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Welcome

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Principal Analyst / ISP Stakeholder Engagement

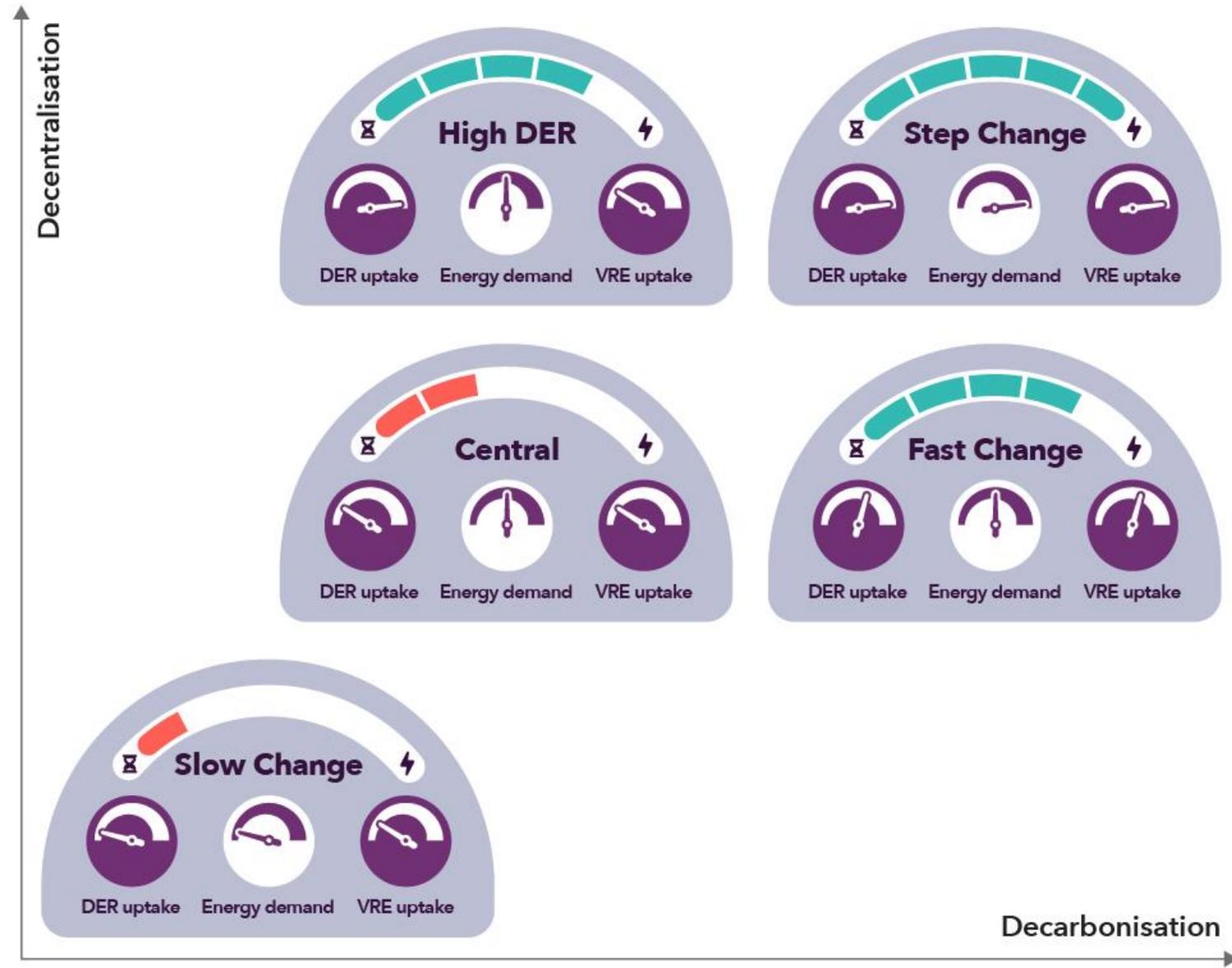


Introducing...the ISP



Craig Price | GM System Planning

Managing risks, costs, and reliability in a world with large future uncertainty



Resource Outlook



Andrew Turley | Manager, Integrated Energy Systems

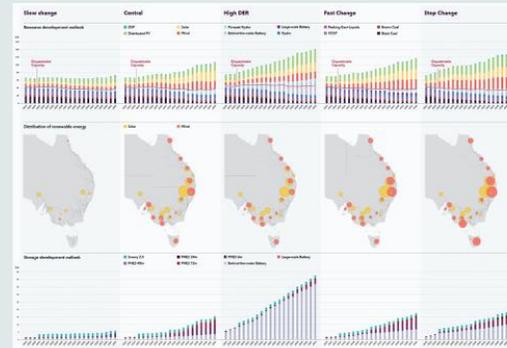
Resource Outlook

- What we heard from stakeholders?
 - Strong role for storages of various technologies, locations and storage depths
 - Balance of renewable energy technologies (wind and solar) to complement storage and network availability
 - Battery storage potential much stronger than initial projections
 - Cost uncertainty and resource availability may provide development challenges that need consideration



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Resource Outlook



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Resource Outlook



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Resource Outlook

Andrew Turley

Manager, Integrated Energy Systems



- If ISP should inform policy, is it contradictory for policy also be an input?
- The ISP is reasonably founded on incremental thinking in terms of network development. Have you modelled some potential game changers? For example long distance HVDC from North Queensland to Darling Downs/Brisbane to Wagga/Sydney/Snowy which dramatically unlocks REZ development and improves diversity
- Figure 14 shows step changes in coal capacity, as coal retirements occur in 2025, 2026. Which coal fired power stations are they? The sizes seem to correlate with Callide B and Eraring??
- Rooftop PV growth slow down in the modelling looks highly unlikely given Victoria gov rebates amongst other
- How does the ISP contribute to dealing with and avoiding in the future the issues we are currently seeing in Western Victoria?
- Is it possible that the market has better data than the ISP and therefore chooses to locate in different areas? Is there a process for the ISP to follow where generators are looking to connect rather what the modelling decides is the better placing?
- How does the ISP account for new offshore wind projects, and are these included in renewable energy zones? Can you also provide an update on modelling for the 'step-change' scenario and what might needed to achieve this?
- A rooftop follow up question please; we felt sceptical about the amount of rooftop forecast to join. Can you elaborate on how the forecast can be reconciled with the physical constraint of number of rooftops/dwellings, and the distribution level integration constraints we have read are arising now in some areas. Further does your rooftop forecast assume ongoing government subsidy, or is it unsubsidised and therefore does it imply that rooftop is cost competitive with utility (even accounting for the ability to use tracking at utility scale to better access peak demand periods)
- What is the relationship between COGATI and the ISP from the point of view of informing transmission decisions under IMP given that COGATI now doesn't say anything about transmission incentives (except for the locational pricing and FTR that are to be used to risk manage generation only)

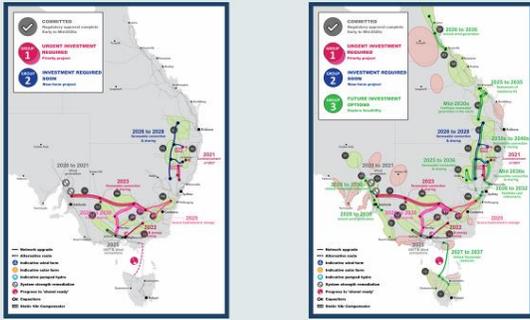
Here are the questions that our participants asked.

REZ, Renewable Integration & Network



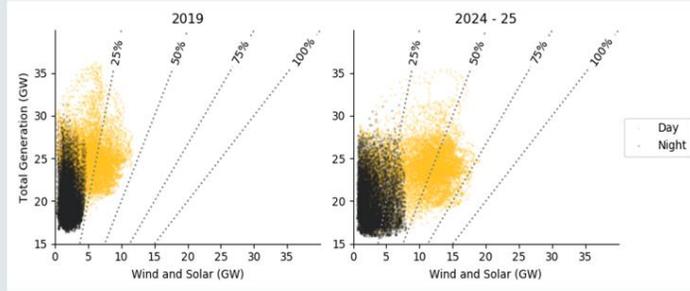
Elijah Pack | Manager National Planning
Chris Davies | Manager Future Energy Systems
Bianca Christison | Acting Principal Engineer

REZ, Renewable Integration & Network



REZ, Renewable Integration & Network

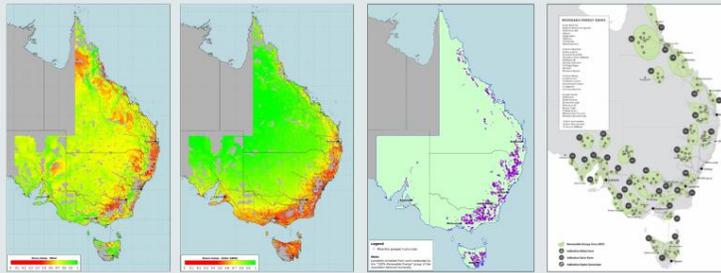
NEM total generation and wind and solar PV generation 2019 (actual) and 2025 (central scenario)



REZ, Renewable Integration & Network

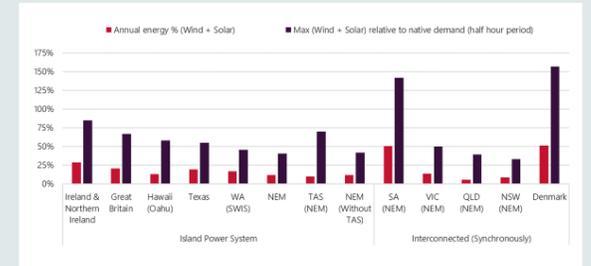
- What we heard from stakeholders?
 - System strength analysis and costing is a priority
 - Other system security services, such as frequency control, operating reserves and fleet ramping requirements should be detailed
 - The outcomes from the Renewable Integration Studies (RIS) should be integrated into the ISP
 - Include more detailed analysis of how strategic placement of storage can be optimised to limit network build
 - Consider ways to stage REZ expansions

REZ, Renewable Integration & Network



REZ, Renewable Integration & Network

Large international power systems operating with high instantaneous penetrations of wind and solar generation, and Australian comparisons



REZ, Renewable Integration & Network

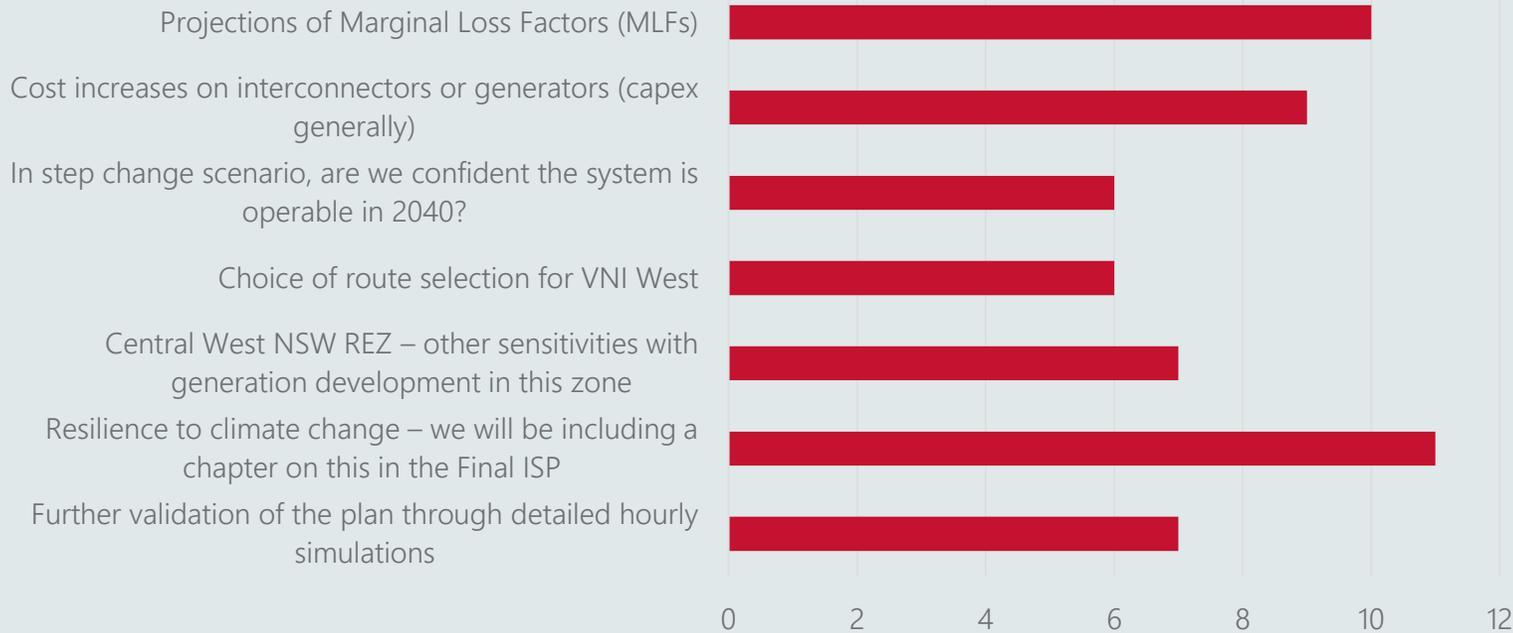
Elijah Pack, Manager National Planning
 Chris Davies, Manager Future Energy Systems
 Bianca Christison, Acting Principal Engineer

- Is the DNV-GL report on offshore wind available? What potential and cost does it show for Gippsland REZ?
- Is the identification of potential REZs influenced by knowledge of existing interest in each area?
- Just want to leave the comment that the assumption in the CSIRO modelling that subsidies fall to zero by 2021 does not look very likely given the political constraints that have been demonstrated time and again when the closure of the STC scheme is considered.

Here are the questions that our participants asked.

Prioritising further work





- Further validation of the plan through detailed hourly simulations
- Resilience to climate change – we will be including a chapter on this in the Final ISP
- Central West NSW REZ – other sensitivities with generation development in this zone
- Choice of route selection for VNI West
- In step change scenario, are we confident the system is operable in 2040?
- Cost increases on interconnectors or generators (capex generally)
- Projections of Marginal Loss Factors (MLFs)

Prioritisation for final ISP



Want to contribute? Head to [Slido](#) and join #ISP

We asked participants to vote on the three things that AEMO could prioritise in the lead up to the final ISP.

Here's how the voting played out

- Work with industry and consumer advocates to better understand DSP behaviour to explore how better understanding of benefits of demand response etc can increase participation. le can the DSP resource be grown through education?
- How the plan can respond to unanticipated investor interest in various areas., rather than investors follow the plan
- How the grid can use microgrids to improve resilience and reduce transmission cost
- System strength and stability (prior to 2040)
- Consideration of locational developments of pumped hydro storage (eg. Locational cost benefits, existing generation developers being ready to develop identified sites)
- Overall impact of higher transmission costs on power bills
- We have discussed today (and in other forums), that delivering the ISP blueprint relies on regulatory changes and action by other parties. It may be worthwhile AEMO making some statements in the ISP to highlight what it feels should be done (where appropriate how). Whilst AEMO may feel some of these topics are outside of its core role, it is important to reflect on how other parties/bodies can play a role in delivering the plan.
- Explicitly consider the impact of single structural failures that take multiple circuits out of service - this may be a necessary component of investigating resilience to climate change
- More work on large scale /utility scale batteries as an alternative to transmission and pumped storage. They are likely to get significantly cheaper over a 25 year period.
- Off-shore wind should also be considered as costs could become suitable over the same horizon
- Resolving potential inconsistencies with coordinated transmission and generation investment messaging from the range regulatory bodies and AEMO. Is COGATI now requiring a more comprehensive review of RIT-T frameworks as it no longer addresses transmission investment as comprehensively? What RIT-T changes does the ISP imply or require?
- Modelling of alternate models such as removing the artificial generator trading market.
- Delivery of ISP through 100% public ownership.
- Type of model of the transmission network that allows new RE to more efficiently connect. I.E built with established connection points / capacity.
- Impact of current regulatory decisions on the resilience of the existing network particularly in the face of climate impacts. I.E slashing budgets for maintenance and vegetation management.
- Better represent role of storage – including how investable it is - and consider deployment flexibility/risks - to align with real-world deployments of utility scale battery storage
- Update electric vehicle assumptions and predicted impacts on grid charging - step change could have more bullish forecasts than other scenarios
- Broader assessment of other technology options
- Role of hydrogen and potential impact on the future electricity system
- Allocation of costs between gens and consumers
- "True" least-cost modelling - absent policy
- Smaller REZ options

We then asked what else our participants think AEMO could consider as they finalise the ISP modelling, here are their comments

Q&A



Want to contribute? Head to [Sli.do](#) and join #ISP

- What is going on with the West Murray connection issues?
- Now that both Victoria and NSW have updated their energy efficiency schemes does this trigger an update to your input or when do you expect to? Also consider the Victoria carbon targets coming up
- There are new technologies/solutions to integrate REZs and/or to provide grid support that may be considered, such as HVDC, multi-terminal DC or medium voltage grids. Providing an analysis, with the main benefits that these alternatives may provide, may encourage TNSPs and investors to consider those options. Do you have any comment on this regard?
- Based on press reports the management of Tomago Smelter, I do not believe that firmed renewables alone will satisfy the demand of major industrial loads. What modelling has been done on the future position with little to nil coal generation in regard to smelter like loads and ensuring continuity of operation?
- At what stage would ISP look at intra-regional transmission investment, if at all?
- Have there been any scenario analysis for high impact/low probability risks - eg Early retirement of coal plant or failure of interconnectors? And whether any benefit is assigned to rapid deployment of replacement capacity or use of assets during islanding events as we're currently seeing in SA (i.e. Batteries can be built in <1 year, pumped hydro take 5 to 10 years...)

Here are the questions that our participants asked when we opened up to a general Q&A



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Next steps



Next Steps

Natasha Sinclair

Principal Analyst / ISP Stakeholder Engagement





Thank you!

Appendix

Feedback

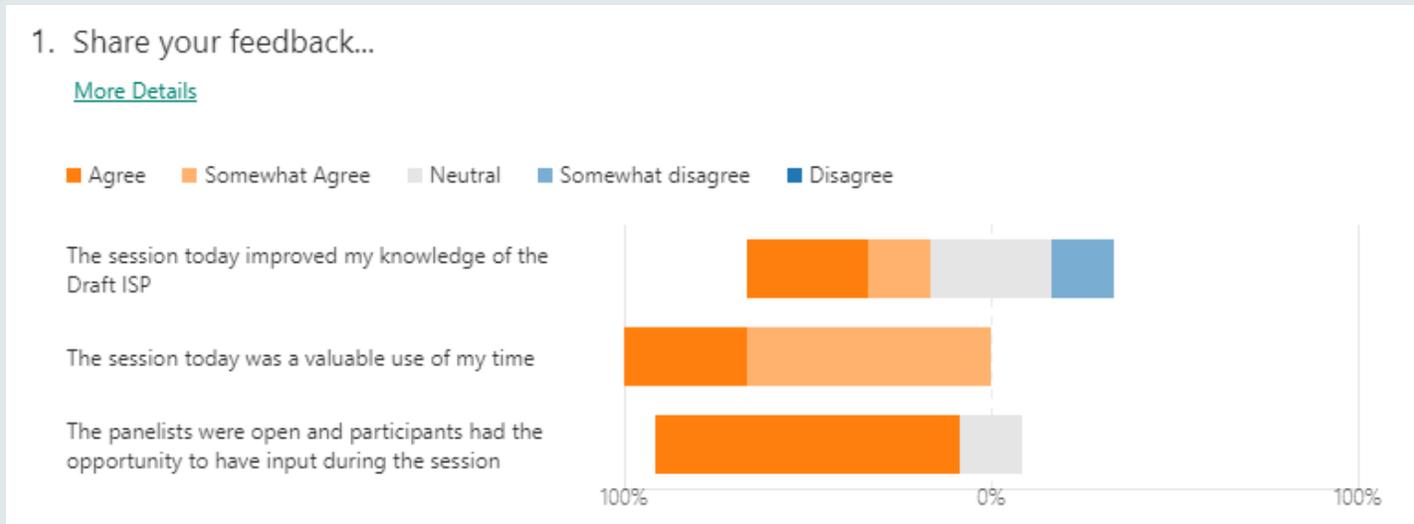
We had a great conversation and heard some important questions during our time together.

We've captured the feedback from the session, here, in the following appendix.

Webinar Feedback



Approx. 70 people dialled in via WebEx
Approx. 38 people accessed the Sli.do survey
We received 6 Responses to the feedback survey



Share your feedback
Leichardt Scale questions

I liked....

- The interaction within the panel members and the attendees.
- The use of sli.do. Also the meeting was very well chaired.
- The recognition that battery cost needs to be updated urgently.
- Multiple experts on the panel who knew their area.
- The ability to ask questions on the ISP.

I wished....

- To have more time for interaction.
- AEMO recognised the low likelihood of central forecast for PV growth given the assumption all support ceases after 2021. which is political suicide in my opinion. The popularity of rooftop solar support has been proven time and again.
- It seemed to be more of a question and answer session rather than us providing feedback and concerns to AEMO for the ISP.
- I could have got a ticket for the in person session. I missed out due to demand.
- Questions should have been submitted online prior to the webinar.

What if we....

- Split future webinars in subtopics to facilitate the interaction.
- Provided more clarity on the projected cost of new renewable generation in various regions to outline how significant the modelled differences in cost are and the reasons. If costs in two regions are close then investor interest for connecting in a particular part of the grid should drive the network solution.
- Considered how hard it will be to get planning approval for 11,000MW of PHES...
- Include Renewable generation from Biomass in regional areas supplying behind the meter power to industry in the planned generation mix for the 2020 ISP? Biomass was included in the 2018 ISP on the graphs such as Figure 9 Forecast NEM generation capacity in the Neutral case (but the light blue line is hardly visible) Biomass was also mentioned in footnote 36 of the 2018 ISP.