Stakeholder comments on scenario likelihoods for the 2022 Integrated System Plan

Introduction

On 5 October 2021, AEMO convened an expert panel, using the Delphi technique, to consider the relative likelihood of the five scenarios contained in AEMO's 2021 Inputs, Assumptions and Scenarios for Planning and Forecasting. Relative weighting of the scenarios is used in the analysis to determine the Optimal Development Path (ODP) in the 2022 Integrated System Plan (ISP).

AEMO published the results of the Delphi panel on 15 October and invited written comments, via a structured survey, until 25 October. AEMO also held a public forum on 22 October to explain the process, outline the results and gauge stakeholder views. Both the survey and the forum also sought stakeholder views on what implication an Australian Government commitment to net-zero carbon emissions, economy-wide, would have on the likelihoods of the scenarios. Stakeholders considered in such a circumstance that a second Delphi Panel should be convened to reassess the scenario likelihoods.

The Prime Minister announced such a commitment on 26 October 2021. A second Delphi Panel was held on 16 November 2021.

Scenario weightings will be assigned in the Draft ISP, to be published on 10 December. The Draft ISP will be subject to a full consultation process. The Draft ISP and associated material will also provide further discussion of the Delphi Panel processes.

Details of each element of the consultation process on the Draft ISP are available at: https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/opportunities-for-engagement.

Consultation Questions

Stakeholders were asked two questions related to scenario weightings, as shown below. No additional comments were received on other matters. The questions were:

- Question 1: Do you have any concerns about the use of the scenario weightings identified by the expert Delphi Panel, as shown?
- Question 2: If the Australian Government commits to net-zero emissions by 2050 at, or ahead of, the COP26 Glasgow climate change conference, do you agree that the likelihood of the Steady Progress scenario is reduced to zero?

  If that scenario is removed, should AEMO adjust the other likelihoods, as shown, or reconvene the Delphi Panel to reconsider the weightings?

Stakeholder comments

Question 1: Do you have concerns about the use of the expert panel results?	Question 2: What does a net-zero commitment mean for the Steady Progress scenario? Should there be a second Delphi Panel?
Network of Illawarra Consumer of Energy (NICE)	
Steady Progress and Slow Change are inconsistent with policy of Net Zero by 2050. A single new scenario should be fashioned from them called Emissions Reduction Failure, looking more but not	Reconvene the Panel when you have enough information to materially reduce uncertainty, being mindful of how long it will take to update the modelling based on new scenario weights and the

Stakeholder comments on scenario likelihoods for the 2022 Integrated System Plan

entirely like Slow Change. The Delphi process should be re-run across the revised 4 scenarios. (PS Given all States and Territories had net-zero targets already the only thing the Fed decision does is avoids the need for AEMO to pretend that net-zero isn't the target).	draft ISP deadline. It is likely to be best to reconvene the panel between the draft and final ISP when we have better information about the government's policies and how it intends to implement them, which we are unlikely to know in sufficient time for the draft ISP which is due just 4 weeks after COP26 closes.
Electrical Trades Union of Australia	
The slow change scenario is obsolete and should not be incorporated.	See answer to [previous question].
ISP Consumer Panel	
No, subject to the question below. The relatively high level of alignment between different stakeholder groups provides reassurance that the results are robust and not materially skewed by the composition of the panel. Using the Delphi Panel instead of AEMO's own subjective views as in the 2020 ISP is an excellent initiative. AEMO overriding the Panel's results would undermine the value of the Delphi process	I would reconvene the panel, include the net zero 2050 in all scenarios in such a way that while the target is reached by 2050 the different scenarios all define different trajectories.
Origin Energy	
See next answer.	I would leave it as is. Inertia is hard to overcome!
Vast Solar Pty Ltd.	
No	Steady change should be expanded rather than reduced - the Govt's recently released Net Zero plan continues to subsidise fossil fuels, leave renewables largely to the market and relies heavily on unspecified technology that doesn't exist yet.
Australian Energy Regulator	
No.	[No response]
RE-Alliance	
Australia has much more than a 13% chance of achieving the 'hydrogen superpower' scenario identified by the AMEO expert Delphi Panel. We consider the 'hydrogen superpower' scenario should receive the strongest weighting because: 1. The business sector is already making plans for and advocating for this scenario: https://www.bca.com.au/sunshot_australia_s_opportunity_to_create_395_000_clean_export_jobs;	We agree that the likelihood of the steady progress scenario should be reduced to zero given that the Government has committed to net-zero emissions by 2050. We support the proposed re-allocation of the likelihoods as a reflection of the outcomes of the Panel and do not consider that the Delphi Panel should be reconvened.

2. This scenario is the minimum needed to replace fossil fuel exports with clean exports https://bze.org.au/research_release/million-jobs-plan/ 3. Elements of this scenario are already being progressed by the private sector (e.g. https://www.theguardian.com/australia-news/2021/may/17/australias-first-fully-renewable-hydrogen-valley-slated-for-nsw-coal-heartland| https://www.abc.net.au/news/2021-10-10/qld-palaszczuk-andrew-forrest-hydrogen-gladstone/100527670) 4. Elements of this scenario are reflected in existing state government policies, such as the SA government's 500% renewable policy, the Tasmanian government's 200% legislated target, the recent QLD government announcement https://statements.qld.gov.au/statements/92322 , etc	
ClimateWorks Australia	
Yes. Our concern with the highest weighting put towards Net Zero 2050, a delayed action scenario, is because it would be inappropriate for planning an electricity system that would cope with a clean energy future. In particular, there's also a heavy weighting towards business-as-usual situation to 2030, which conflicts with current state policies that stack up to 37-42% emissions reduction by 2030. The low weighting towards Hydrogen Superpower is also a concern given we are already seeing private sector investment and state government policies in large-scale hydrogen production, which is highly impactful on the energy system and not captured at all in the other scenarios. ClimateWorks Decarbonisation Futures report shows that technological progress, especially in relation to zero emissions electricity generation technologies, has consistently outpaced predictions and expectations. Heavily weighting the ISP process to a delayed action scenario could risk underestimating the investment requirements needed for a clean energy future.	I would expect the likelihood of the Slow Change scenario to be reduced to zero (rather than Steady Progress). COP26 represents a pivotal international moment around climate discussions and ambitions, which will have a significant and direct impact on the electricity/energy system. Panel perceptions and stakeholder attitudes on the relative likelihood of other scenarios are also likely to shift as a result of COP26, based on global announcements, in addition to Australia's commitments. Given this, the Delphi panel should be reconvened.
Beyond Zero Emissions	
The Hydrogen Superpower should be weighted much higher given the accelerating momentum towards decarbonisation and hydrogen deployment. From recent announcements:	A key goal of the COP26 conference is to accelerate global climate ambitions. Given the significant decarbonisation goals from key trading partners such as the EU, US, UK, Japan, China and South Korea, this momentum will only grow. This is

Stakeholder comments on scenario likelihoods for the 2022 Integrated System Plan

> The Federal Government's Hydrogen Industrial Hubs program is fast tracking the establishment of a local hydrogen industry and sending a strong signal to investors for further private investment into this sector. > Large scale projects are responding to this demand, including the Central Queensland Hydrogen Project, Hunter Hydrogen Hub, Asian Renewable Energy Hub, Western Green Energy Hub as well as Fortescue's numerous projects around Australia. > Fortescue Future Industries for example has committed to producing 15 Mt of green hydrogen by 2030. > Rio Tinto has committed 50% emission cuts by 2030, directing over $7.5 billion towards decarbonisation. This ambition covers their aluminium smelters at Boyne Island and Tomago, as well as alumina operations in Gladstone. > International markets have indicated strong appetite hydrogen as a zero-emissions import, this includes Japan (10 Mt by 2030) and the EU (10 Mt by 2030) > State governments are driving decarbonisation across the whole economy with 50% emission reduction targets by 2030 from VIC, NSW and SA while Tasmania is committing to net zero emissions by 2030. All are progressing with roadmaps and decarbonisation plans across their economies. > Transgrid's recent "Energy Vision" report shows that not only does the Clean Energy Superpower scenario (similar to Hydrogen Superpower) create significant job and export opportunities, it also leads to the lowest price of electricity in the NEM (mainly through the use of electrolysers as demand management to reduce storage requirements) > Analysis by Beyond Zero Emissions "Export Powerhouse" highlights this significant opportunity for renewable hydrogen including potential exports worth $5.2b by 2030. In addition, it shows that Australia has significant export opportunities with green steel, green aluminium and critical minerals. All of which require significant build out of renewables and firming capacity. > The Business Council of Australia/WWF/ACF/ACTU "Sunshot" report has identified similar opportunities, along with the potential creation of 400,000 jobs. > Analysis from PWC's Strategy& "The dawn of green hydrogen", EY's "Renewable Energy Country Attractiveness Index" show Australia as a highly	further reinforced by the push from global financial institutions such as BlackRock, HSBC, UBS directly assessing climate risk as part of investment decisions (see Net Zero Asset Managers Initiative, representing $43 trillion in assets). In addition, major companies such as BHP and Rio Tinto are publicly acknowledging that decarbonisation is actually advantageous for the growth and long term performance of their business. The Steady Progress and Slow Change scenarios are therefore actually out of step with markets, most of which have stated clear net-zero targets by 2050 for scope 1 and 2 and many are expanding to include scope 3. Many of these key businesses have also indicated significant emission reduction targets by 2030 and includes Rio Tinto (50%), Fortescue Metals Group (net-zero), BHP (30%), Orica (40%), Telstra (50%) and Woolworths Group (63%). For a truly representative market-led scenario, a net-zero by 2050 should be the actual minimum baseline. In light of this, AEMO should reconvene the Delphi to reconsider the weightings and the suitability of the Steady Progress and Slow Change as "market-led" scenarios.

promising location for green hydrogen production and export. > Car manufacturers are phasing out production of internal combustion engines (eg: Toyota by 2040, GM by 2035, Volvo by 2030) When combined with increasing gas costs, decreasing electricity prices, growing public support for decarbonisation, increased investor scrutiny of climate risk and the rapid scaling of electrolyser and battery technologies (and the associated cost reductions), the Hydrogen Superpower has a significantly higher than 13% chance of occurring.	