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Submission to Consultation on 2020 Planning and Forecasting Scenarios Inputs and Assumptions

Dear Alex,

AusNet Services welcomes the opportunity to make this submission on AEMO's 2020 planning and forecasting scenarios inputs and assumptions. AusNet Services appreciates the effort that AEMO has put into engaging with stakeholders to formulate the scenarios and consult on the inputs and assumptions that will form the basis for AEMO's forecasting and planning publications including the final *2020 ISP*, *2020 Electricity Statement of Opportunity (ESOO)*, *2020 Gas Statement of Opportunity (GSOO)*, and *2020 Victorian Annual Planning Report (VAPR)*.

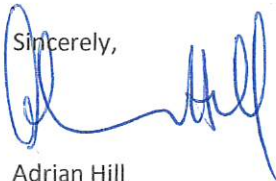
AusNet Services acknowledges the complexity and pace of change that AEMO is managing across the wide range of inputs and assumptions to this process. Our review concludes that most of the key forecasting inputs and assumptions are reasonable. We would like to draw attention to the following topics where additional detail may result in material changes to forecasts and outcomes of the modelling:

- Augmentation options for VNI West
- Firm capacity of scheduled generators
- Impact of weather on generation output and reliability
- Transmission network planned maintenance and availability rates
- DER projection for the Fast Change scenario

Further detail on these points is included in the attachment to this letter.

We would be pleased to meet to discuss our comments and provide further assistance. If we can assist in this way, please contact Jacqui Bridge - Manager Transmission Planning and Development.

Sincerely,



Adrian Hill
General Manager –Transmission
AusNet Services

Attachment: Information to further inform inputs and assumptions

Augmentation options for VNI West

The assumptions worksheet includes a range of options for augmentation of the VIC-NSW interconnector (Options 5A, 6, 7, 8, 9, 10, 11). Apart from option 5A (the existing VIC-NSW interconnector route), all other options connect into the Victorian 500kV network via the North Ballarat and Sydenham terminal stations.

AusNet Services is concerned that this will create a highly critical network element collecting generation from the western and north western Victorian renewable developments as well as providing the flow path for import from NSW. Outages for future maintenance of this network element are likely to be highly constrained and time limited due to the criticality of this element. This would lead to reliability and system security issues, compared to alternatives that could avoid such single point concentration.

AusNet Services has been exploring an alternative route for the VIC-NSW interconnector which would connect into the 500kV network via a new terminal station at Donnybrook and follow a central route through Shepparton (VIC) to Wagga (NSW). This option is significantly shorter in route length, lower in cost, provide electrically superior access to the Snowy2 generation, and intersects a developing Renewable Energy Zone (REZ) in central Victoria with opportunity to add spurs to connect other renewable energy zones. It also provides a diverse route into the Melbourne load centre thereby improving security of supply to Melbourne. Details are in the following table.

AusNet Services requests this route be included in the ISP options analysis.

Option label		VNI Option 12 (Donnybrook- Shepparton -Wagga)
Drivers for project		Thermal and stability limitations on the existing VIC-NSW interconnection. Enable more efficient sharing of resources between NEM regions. Provides access to REZ in Central North Victoria and Wagga REZ Maintain supply reliability in Victoria 'ahead' of closure of Latrobe Valley generation;
Project description		A new 500 kV double circuit interconnector between Melbourne 500 kV network and NSW 500 kV network (assuming Hume Link goes ahead). This includes: <ul style="list-style-type: none"> • Donnybrook-Shepparton-Wagga 500 kV double circuit line. • 2x500/220 kV 1000 MVA transformers at Shepparton. • 1x500/330 kV 1500 MVA transformers at Wagga. • Power flow controllers on Murray-Upper Tumut, Murray-Lower Tumut and Jindera-Wodonga or Wodonga-Dederang 330 kV lines. • Reactive power plant along the route
Forward direction		VIC-NSW
Notional limit	Forward	3000 TBC
	Reverse	3000 TBC
Indicative cost estimate (\$ millions)		\$1,200
Expected delivery time		2027

Firm capacity of scheduled generators

Recent outages of Loy Yang A¹ and Mortlake², that reduced their ability to contribute to supply during Victorian 2019/2020 summer, highlight the need to revisit assumptions on availability of scheduled generators' (coal-fired and gas-powered plants') during maximum demand periods. As described in the Forecasting and Assumptions Workbook, AEMO currently uses the forecast seasonal rating (winter and summer) of scheduled generators for firm capacity.³

Availability of scheduled generation is most critical during high demand periods which generally coincide with periods of high temperature. During high temperature, high demand periods, firm capacity of scheduled generation is at higher risk of derating and/or forced outages than the average across either the summer or winter periods. Availability at critical times may not be well represented by the seasonal averages.

AusNet Services suggests that firm capacities of scheduled generators be weighted by their historical availabilities or failure rates during times of peak demand using similar methodology as is used to calculate renewable generator's peak contribution factors. This methodology would provide a more reasonable representation of existing generator performance.

Impact of weather on generation output and reliability

In addition to the points previously raised, AusNet Services welcomes the efforts in including sensitivities around the impacts of weather on renewable resource availability as this builds more confidence on the optimal development path.

However, we would welcome expansion of the weather impact sensitivity modelling to existing generation fleet – more specifically how conventional generators are forecast to operate during longer and warmer summer conditions, and how these conditions are likely to impact generators' availabilities and output capacities (i.e. time spend generating above 40 degrees C).

The assessment of historical availability profiles, particularly picking up performance in recent years, appears to be quite robust. The projection of those reliability rates into the future is important and AusNet Services is keen to understand the input assumptions on generator reliability forecast given the changing climate conditions.

Transmission network planned maintenance and availability rates

Network Service Providers require network outages to maintain, refurbish, and replace assets as well as to connect new customers. The changing use of the network to accommodate more distributed generation has imposed significant and increasing constraints on planned outages which routinely impose constraints on generation and, in some cases, load. AusNet Services considers the requirement for planned outages has a material impact and suggests that the implicit assumption that the transmission network elements are *100% available except during contingencies* (N-1 case) is optimistic.

¹ AGL, *ASX and Media Releases*, available at <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2019/september/loy-yang-a-unit-2-repairs-well-underway>, viewed on 20 January 2020.

² Origin Energy, *'Mortlake Power Station returns to service, generating capacity increased'*, available at <https://www.originenergy.com.au/about/investors-media/media-centre/mortlake-power-station-returns-to-service.html>, viewed on 20 January 2020.

³ Firm capacity is power assumed to be available at times of peak demand for the purpose of meeting reserve requirements in Capacity Outlook models. Firm capacities for existing and committed generators are given only for the thermal and hydro generators; these are procured from the generators' summer ratings given in the AEMO Generation Information page (2019 August release). Australian Energy Market Operator, *'Scenarios, Inputs, Assumptions And Methodologies For Planning And Forecasting'*, available at https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/Inputs-Assumptions-Methodologies/2019/2019-Input-and-Assumptions-workbook-v1-3-Dec-19.xlsx, viewed on 20 January 2020.

The use of historical availability rates to include both planned outage requirements and unplanned contingencies (N-1-1 cases) would provide a more realistic input to various modelling exercises.

In FY 2018-19 alone, network outages across the NEM caused more than 300 outage constraint equations to bind. The average marginal cost of these outage constraints was \$110/MWh per 5-min trading interval. AusNet Services high level estimates of the impact of these outage constraints on the market is in the order of \$800,000 per year.⁴ Additionally, several of these outage constraints have limited interconnector capabilities and at times, caused limited flows between regions.

DER projection for the Fast Change scenario

We have considered the specific Consultation questions and have only one point to raise regarding the DER projection for the Fast Change scenario presented in Table 9. AusNet Services would appreciate if AEMO could explain why the projection reverts from the CSIRO Fast Change to CSIRO Neutral Growth scenario after 2025. The change from one forecast to another appears to compromise internal consistency of the projection.

⁴ AusNet Services internal analysis