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Ms Clare Savage
Chair, Australian Energy Regulator
GPO Box 520
Melbourne, Vic 3001

Dear Ms Savage

Impact of recent policy announcements on Project EnergyConnect's benefits

AEMO has been considering how best to support decision making on Project EnergyConnect in light of recent New South Wales legislative change. In this regard, insights drawn from the 2020 Integrated System Plan (ISP), not previously published, may provide greater confidence that the recent developments – in particular, the accelerated development of renewable generation – are unlikely to have significantly eroded the benefits of the project.

The 2020 Integrated System Plan used a range of scenarios that varied with respect to the rate of change in the National Electricity Market (NEM) to build a robust optimal development path (ODP) that performs well, irrespective of how the system evolves. To test the robustness of key projects within the ODP, such as Project EnergyConnect, AEMO conducted 'take one out at a time' (TOOT) analysis on the Central, Fast Change and Step Change scenarios as part of its internal modelling process.

By inspecting how the incremental market benefits of Project EnergyConnect vary under the different scenarios, it is possible to infer how current market developments may impact the net market benefits of the project without re-modelling.

Scenario likeness

AEMO considers that the future NEM is currently developing more in line with the Fast Change scenario than the Central scenario:

- In the Central scenario, there is minimal development of new large-scale variable renewable energy (VRE) until 2032-33 in New South Wales. By 2031-32, the Fast Change scenario already has over 7 GW of new VRE in New South Wales, as well as 1.5 GW of new large-scale battery storage. Although the scale of development is not as large as that targeted by New South Wales Government policy, the Fast Change scenario is far closer than the Central scenario.
- The Fast Change scenario also has more VRE build in South Australia over the same time period than the Central scenario, more aligned to recent progress towards commitment of projects such as the Port Augusta Energy Park and Cultana Solar Farm.

- Observed rates of uptake of distributed photovoltaics have been faster than assumed in the Central scenario, and more aligned to the Fast Change scenario.
- The Fast Change scenario also has more distributed battery installations assumed in South Australia, although the magnitude is smaller (less than 120 MW additional storage by 2030) compared to AGLs recently announced 250 MW large-scale battery project at Torrens Island.

The Fast Change scenario includes earlier closure of some black coal generators in New South Wales. It is unclear yet how coal plant in New South Wales may choose to operate differently in response to the policy announcements, but earlier closure is possible. As highlighted by the ESB in its market 2025 directions paper, "the addition of capacity from government-backed schemes places downward pressure on the energy price, which may make it difficult for thermal plants to maintain commercial viability, and likely leads to exits of thermal plant faster than anticipated".

It could even be argued that the current rate of development and policy intent is more aligned with the Step Change scenario, particularly given the scale of development targeted through the New South Wales Government policy. By 2031-32, the Step Change scenario has around 9.5 GW of new VRE in New South Wales (including capacity committed since November 2019), and 12 GW by 2034-35. However, this scenario also has multiple early coal-fired generation retirements projected in the next decade.

Attachment A to this letter provides greater detail of similarities between the Fast Change scenario, the Step Change scenario, and current committed developments in New South Wales and South Australia.

Impact on cost benefit assessment

Although the projected developments are very different between the Fast Change and Central scenarios, particularly in New South Wales, the incremental benefits of Project Energy Connect as determined through TOOT analysis shows that the net benefits of the project are very similar:

- Under both scenarios, the primary source of market benefits are fuel cost savings. In the Fast Change scenario, the benefits attributable to fuel cost savings are approximately $130m less than in the Central scenario due to VRE displacing some gas powered generation both with and without Project EnergyConnect. Importantly, any additional increases in VRE, as per the Step Change scenario, have no further impact on fuel cost savings associated with the project.
- Reductions in fuel cost savings in the Fast Change scenario are offset by approximately $110m of additional generation capital cost reductions. Much of these capital deferral benefits arise due to the earlier than expected closure of coal-fired generation in the Fast Change scenario and the ability for Project EnergyConnect to more efficiently share resources across the NEM to cover these closures.
- In both the Central and Fast Change scenarios, the total net market benefits of Project EnergyConnect exceed at least $300 million based on our Detailed Long-Term modelling, assuming a project cost of $1.99 billion. Note that due to time value of

money effects, the maximum cost of Project EnergyConnect that would deliver positive net market benefits is larger than the sum of the above net market benefits and the assumed project cost in the ISP.

By comparing differences in market benefits between scenarios, it is clear that accelerated development of renewable generation in New South Wales reduces the fuel cost savings delivered by Project EnergyConnect, up to a limit. Gas powered generation continues to play an important role during peak demand periods, when VRE output is low, or when needed to maintain system security, irrespective of the level of VRE developed, and is relied upon to play this role more frequently without Project EnergyConnect.

Further, if this accelerated development of renewable generation leads to early coal retirements then Project EnergyConnect delivers capital deferral benefits. In the scenarios considered in the 2020 ISP, these capital deferral benefits increase as more coal plant exits the NEM early. Significant pre-emptive development of large-scale battery storage projects, such as the publicly announced 700 MW Origin Energy project, or the 500 MW Neoen project in New South Wales would reduce the potential for additional capital deferral benefits.

Even with the AER's preliminary assessment that the prudent and efficient capital cost for the project is $2.15 billion, and assuming no additional capital deferral benefits associated with early coal closures, the project would still deliver net market benefits in the Fast Change scenario and Step Change scenario, although the benefits would be small. The upside is that the investment would deliver greater benefits to consumers in the event that coal fired generation in New South Wales retired earlier than expected.

Analysis conducted during the 2020 ISP identified that the estimated net market benefits of Project EnergyConnect increase if modelling is conducted with detailed hourly chronology in "Short Term" modelling. Therefore, these benefits are considered a lower bound on the true net market benefits of Project EnergyConnect.

Two unit requirement

The AER has also requested an update on the refinement of the 2 unit commitment requirement in South Australia, which plays a part in the business case for Project EnergyConnect. AEMO has provided advice on the at least 2 unit operating requirement in South Australia since 2018 and most recently in an August 2019 report for the AER: 'Assumptions for South Australian GPG in the 2018 Integrated System Plan'. This advice still represents AEMO's most up to date view on the requirements of synchronous generators in SA under various conditions. A summary is appended below as Attachment B.

As outlined in the Stage 2 Power System Frequency Risk Review final report section A3, the 2020 PSFRR used the 2 unit requirement as an input assumption for its assessment. The PSFRR has a specific and narrow focus on assessing non credible contingencies. It was never designed to determine all operational system requirements and limits.

South Australia is leading the world with pushing the boundaries for operation without any or very low levels of synchronous generation, as such this is globally untested and requires careful management. To understand the unit commitment requirements from all operational factors, AEMO is currently working with ElectraNet to develop a plan to determine the optimal operating requirements following commissioning of the synchronous condensers. AEMO will share this test plan in April 2021. It will outline how to test the synchronous condensers in operation and how to gain experience and confidence running a system with these new synchronous condensers online. Furthermore, it will outline a pathway to test and explore how to transition the system to operation at lower levels of synchronous units online in South Australia. AEMO welcomes the opportunity to address any feedback or questions the AER may have. The learnings from this testing process will inform our current understanding and longer term requirements for system operation in South Australia. Any changes arising to the 2 unit requirement from this process will require endorsement from both ElectraNet and the SA government.

AEMO hopes that this additional information demonstrates that the 2020 ISP analysis remains relevant and that the insights can be used to inform decision making

Yours sincerely

Nino Ficca
Interim Chief Executive Officer

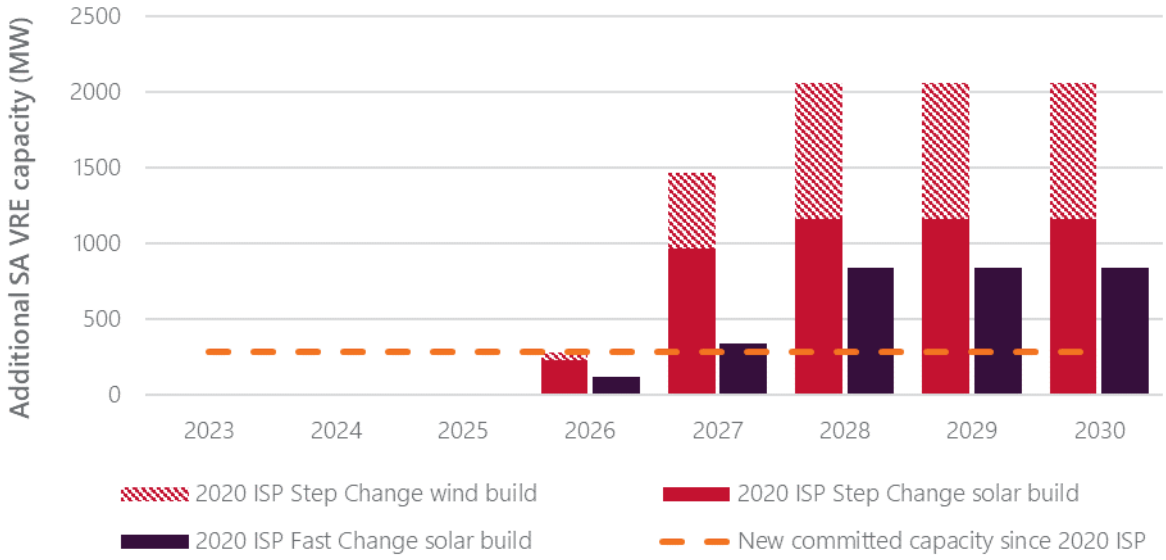
Cc: Hon. Matt Kean MP, Minister for Energy & the Environment, Hon. Dan van Holst Pellekaan MP, Minister for Energy & Mining

Mr Paul Italiano, CEO Transgrid Limited, Mr Steve Masters, CEO ElectraNet Pty. Limited.

ATTACHMENT A

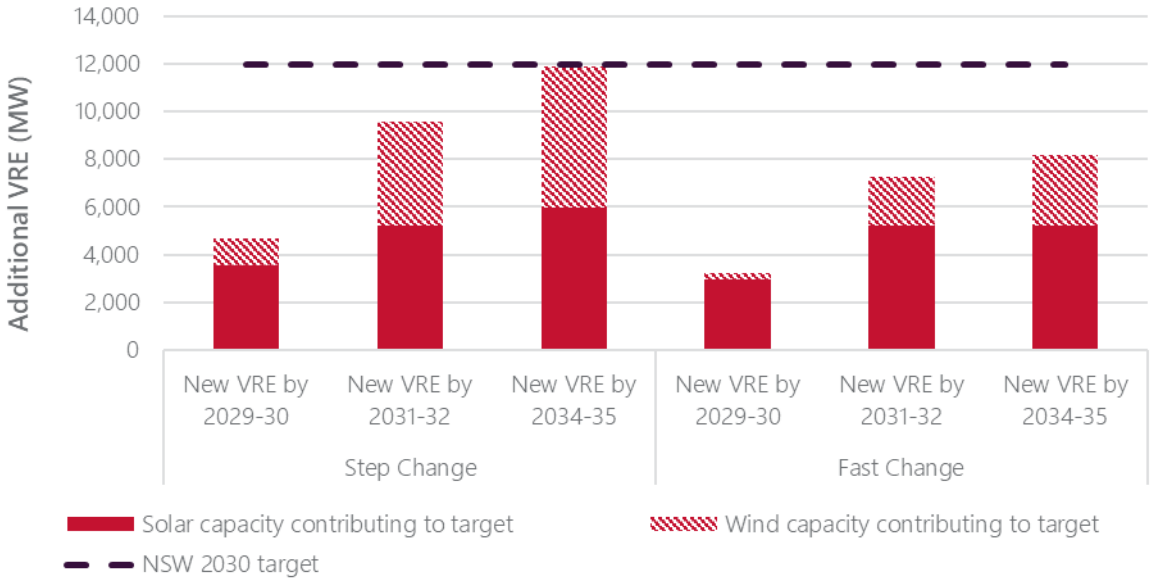
South Australia

Since the 2020 ISP, there has been an additional 289 MW of newly committed VRE capacity in South Australia through the Port Augusta Renewable Energy Park, as indicated by the orange line. In comparison, the additional VRE that is built in South Australia in the ISP reaches this amount by 2026-27 in both the Fast Change and Step Change scenarios.



New South Wales

When considering the 12 GW VRE target set out in the New South Wales Electricity Infrastructure Roadmap, the Step Change scenario is expected to build enough VRE capacity in New South Wales contributing towards the target by 2034-35. The Fast Change scenario falls short of this target but does have over 7 GW of additional VRE by 2031-32 which represents a strong progression towards the 12 GW target.


14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Additional VRE (MW)
New VRE by 2029-30
New VRE by 2031-32
New VRE by 2034-35
New VRE by 2029-30
New VRE by 2031-32
New VRE by 2034-35
Step Change
Fast Change
Solar capacity contributing to target
Wind capacity contributing to target
NSW 2030 target

ATTACHMENT B

Table 1 Planning assumptions for the 2018 ISP

Power System Requirement	Planning assumptions used in the 2018 ISP									
	At least 4 synchronous generating units		At least 3 synchronous generating units		At least 2 synchronous generating units		At least 1 synchronous generating unit		No synchronous generating units	
SYSTEM NORMAL, REQUIREMENT FOR POWER SYSTEM SECURITY										
System strength & fault current	NOW								SYNCONS	ENERGY CONNECT
Operating reserves for ramping					NOW	SYNCONS			ENERGY CONNECT	
SYSTEM NORMAL REQUIREMENT TO SURVIVE 1-IN-3 YEAR SEPARATION EVENT†										
Grid formation							NOW	SYNCONS	ENERGY CONNECT	
Inertia and RoCoF							NOW‡		SYNCONS	ENERGY CONNECT
Primary frequency control							NOW	SYNCONS	ENERGY CONNECT	
Secondary frequency control					NOW	SYNCONS			ENERGY CONNECT	
Operating reserves for energy balance					NOW	SYNCONS			ENERGY CONNECT	
SYSTEM NORMAL MINIMUM REQUIREMENT										
Minimum requirement	NOW				SYNCONS				ENERGY CONNECT	

† A "non-credible" separation event has occurred approximately once every three years since NEM start. With Energy Connect, the separation risk would be reduced.

‡ RoCoF risk is currently managed with a 3 Hz/s RoCoF constraint on the Heywood interconnector.