TRANSMISSION ACCESS REFORM

TECHNICAL WORKING GROUP
INVESTMENT SUB-GROUP

28 JULY 2022

AGENDA

Time	Topic
2:00	Welcome, objectives and agenda
2:05	Project plan for the investment subgroup
2:15	Congestion zones & enhanced network information • Opportunities to enhance existing information • Quantifying available transmission hosting capacity • Process used to quantify transmission hosting capacity
3:15	Connection fees • When do connection fees apply? • What costs are we trying to reflect?
3:40	Parties subject to the access arrangement
3:50	Next steps • Transmission queue – key matters for consideration going forward • Key milestones

PROJECT PLAN

PROJECT PLAN – INVESTMENT WORK STRAND

Focus area 1

- Initial discussion at 28 July TWG
- Working papers to be discussed at 1 September TWG

Focus area 2

- Initial discussion at 18 August TWG
- Working papers to be discussed at 15 September TWG

Focus area 3

- Initial discussion at 15 September TWG
- Working papers to be discussed at 29 Sep TWG (where necessary)

Focus 4

- Matter to be considered once we have further clarity on model.

Role of TWG

- Develop the design of the shortlisted model options
- Identify key issues and considerations to present for public consultation
- Provide inputs to the ESB's interim report.

FOCUS ISSUES FOR DETAILED DESIGN

Focus area 1

Parties subject to the access arrangement

Quantifying available transmission hosting capacity

Process used to quantify transmission hosting capacity

Basis of connection fees

Focus area 2

Process for allocating transmission queue positions

Maximising hosting capacity of available transmission (incl. safety net)

Signals for congestion relief

Use of revenue from connection fees/queue auctions

Focus area 3

Efficient retirement decisions

Treatment of pre-existing generators

Governance

Payment arrangements

Integration with jurisdictional schemes

Interaction with other schemes

Focus area 4

Modelling of impacts

Implementation

Transitional arrangements

Cost benefit analysis

CONGESTION ZONES & ENHANCED INFORMATION

WHAT CONGESTION INFORMATION IS AVAILABLE NOW?

Integrated System Plan

Published every two years

Forecast information over 20 year horizon

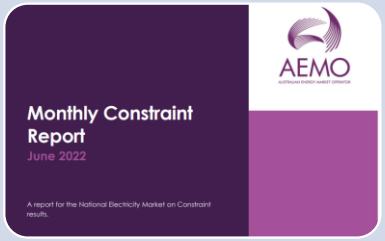
Includes system wide and REZ-specific forecasts of transmission curtailment but does not cover other parts of the network

Transmission Annual Planning Reports

Annual publication

Forward looking information

TNSPs use differing methodologies to prepare forecasts and provide differing levels of detail



Congestion Information Resource

Monthly and annual constraint reporting

Data on mispricing (LMPs)

Backwards looking

ENHANCED INFORMATION – SOME SUGGESTIONS PUT FORWARD IN SUBMISSIONS

1. Obligations for generators to undertake congestion modelling
2. Obligations for NSPs and AEMO to develop of a network modelling portal, and provision of detailed information
3. Standardisation of project development criteria used in planning documents

Clean Energy Council

‘Heat mapping’ of the network:

- Green - spare transmission capacity available and negligible congestion risks
- Amber - there will be limited transmission capacity available, so generators that want to connect in those locations must satisfy certain conditions.

Neoen

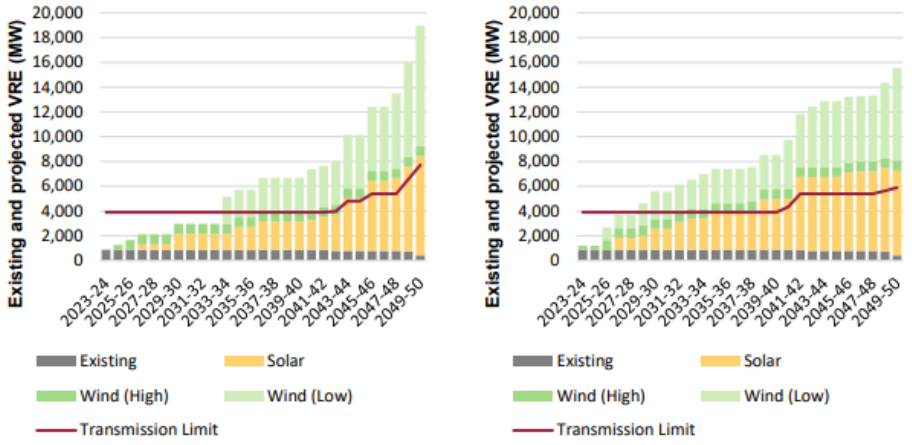
The ESB should pursue a Transmission Statement of Opportunities. This could feed into a “traffic light” approach, that would be accompanied by additional obligations on both generators (to identify congestion) and NSPs (to investigate low-risk upgrades to congested networks).

Iberdrola

WHAT ADDITIONAL INFORMATION IS REQUIRED?

Extract from 2022 ISP REZ scorecard, Central West Orana

Transmission access expansion forecast for *Progressive Change (left)* and *Step Change* (right)



VRE curtailment

Scenario	2029-30		2039-40		2049-50	
	Transmission curtailment	Economic spill	Transmission curtailment	Economic spill	Transmission curtailment	Economic spill
Progressive Change	-	7%	-	3%	2%	11%
Step Change	-	3%	1%	9%	1%	16%
Slow Change	-	17%	-	3%	-	7%
Hydrogen Superpower	-	6%	1%	12%	-	18%

What metrics are relevant to understanding congestion risk?

How detailed does the information need to be?

How frequently should the information be updated?

QUANTIFYING AVAILABLE TRANSMISSION HOSTING CAPACITY

How do we define areas or zones for which we will provide information?

E.g. by REZ or by transmission zone established to capture current or future congestion bottlenecks?

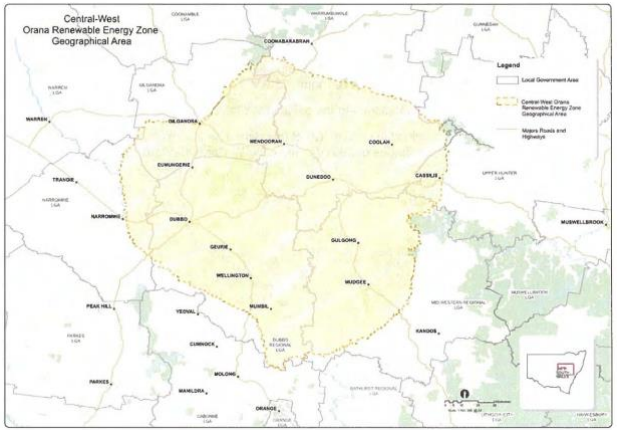
Is there value in defining boundaries for congestion zone or REZ or do we just define by connection?

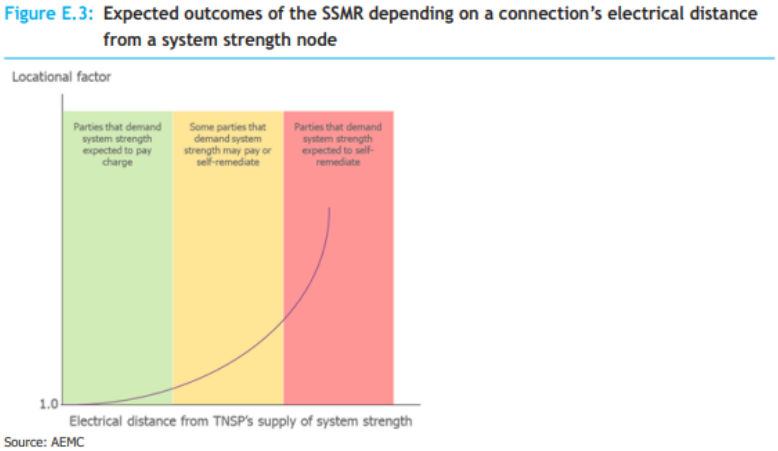
Should we publish information on efficient hosting capacity or should we publish forecast connection metrics and allow participants to decide efficient hosting capacity?

How do we take into account the impact of diverse output profiles when determining where, and for how much generation capacity, transmission hosting capacity is available?

How do we take into account network interdependencies when determining where, and for how much generation capacity, transmission hosting capacity is available?

DEFINING AREAS OR ZONES FOR CONGESTION





- NSW framework defines declared REZs by reference to a map and specified network infrastructure.
- System strength framework calculates the system strength mitigation requirement based on electrical distance from the system strength node

DIVERSE OUTPUT PROFILES – PROPOSED NSW APPROACH (CWO REZ)

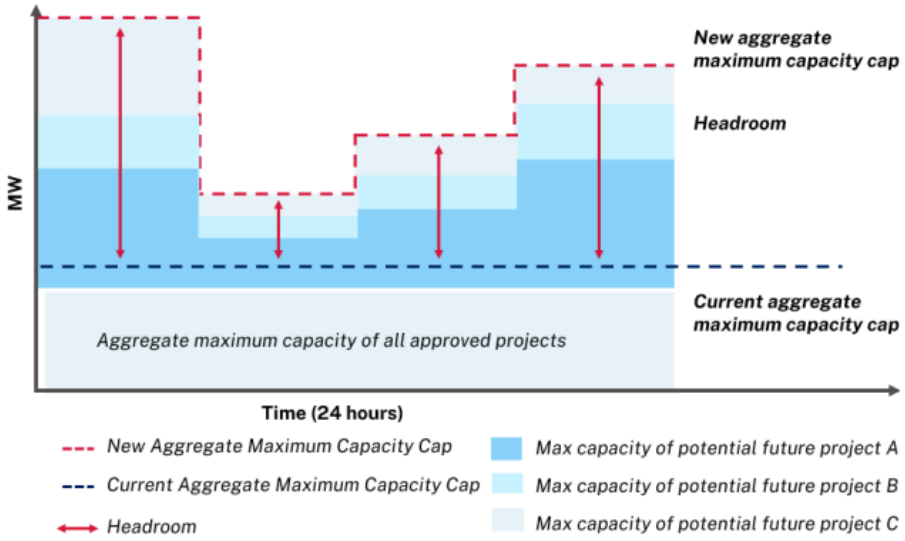
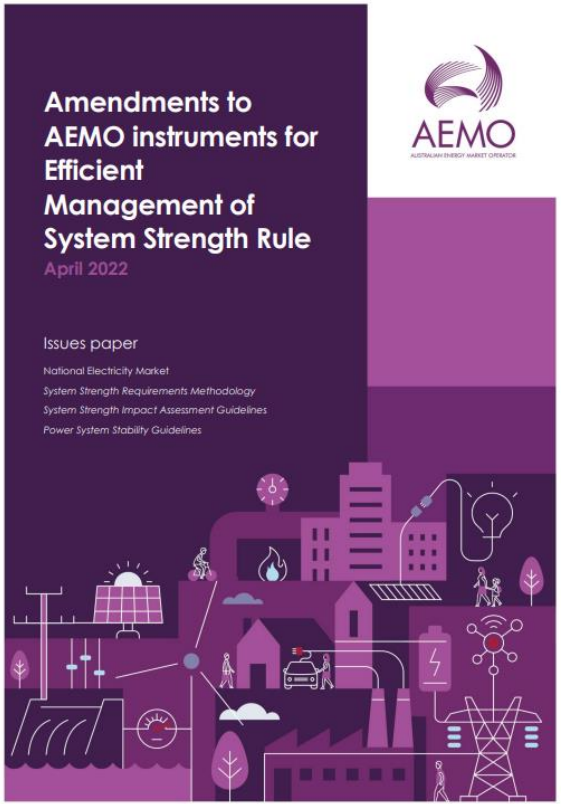


Figure 7: Calculating the new aggregate maximum capacity cap after introduction of maximum capacity profiles

- Infrastructure Planner conducts a headroom assessment will determine the extent to which additional access rights can be made available without breaching maximum curtailment thresholds for existing REZ generators.
- Assessment considers 4 daily periods.
- Under NSW model, access is only granted to projects that do not exceed caps.
- Alternative approach could be to adjust connection fees based on diurnal profile.

DIVERSE OUTPUT PROFILES – AEMO PROPOSED APPROACH FOR SYSTEM STRENGTH



$$IBR\ to\ be\ hosted\ at\ a\ connection\ point = \left((Wind_{installedMW} + Solar_{installedMW}) * CoincidentFactor + Battery_{installedMW}\right) * MVA\_factor + MNSP_{MVA}$$

- AEMO proposes to calculate a coincident factor that reflects the level of coincidence between wind and solar at a given connection point.
- To apply this concept in the context of congestion, it would be necessary to consider a broader range of technologies.

PROCESS USED TO QUANTIFY TRANSMISSION HOSTING CAPACITY

- Is there a need for guidelines to describe process to calculate forecast congestion, and if so, who prepares them?
- Who is responsible for forecasting congestion?
- In what form is forecast congestion information made available?
- How often are congestion forecasts updated?

Could the system strength framework provide a model?

Document	Role
System strength requirements methodology	AEMO methodology that sets out how it determines system strength requirements at key locations. Includes process for identify nodes, modelling future VRE connections and taking into account diversity.
System strength report	AEMO applies the SSRM by selecting system strength nodes and assessing the system strength requirements at each node. Report published at least annually.
System strength impact assessment guidelines	AEMO guideline that sets out how NSPs assess impact of a new connection on system strength.

CONNECTION FEES

WHEN DO CONNECTION FEES APPLY?

How does the framework interact with jurisdictional REZ schemes?

- Connection fees could be inapplicable within a REZ (instead, the jurisdictional scheme applies)
- Alternatively, connection fees could provide a reserve price for REZ access tender processes

Would fees apply everywhere outside nominated REZs?

- Or only when a connection triggers a threshold level of congestion? If a trigger applies, is it measured on a system wide basis or by reference to pre-existing generators?
- Should there be a process to call for tenders where a number of parties show interest in the same location?

Should connection applicants have the option to avoid the fee?

- Instead, they would need to fund physical transmission upgrades (as per the queue model's "safety valve") or accept non-firm access.
- Non-firm access could be physical (e.g. run back scheme) or potentially financial.
- E.g. Neoen has suggested a model where new generators that cause congestion must commit to selling a certain amount of capacity into congestion relief market for free.

WHAT COSTS ARE WE TRYING TO REFLECT IN ANY CONNECTION FEES?

Long run incremental cost of transmission

- Charges based on stylised representation of transmission network and cost of adding new capacity to support project
- Considerations: administrative burden, transparency, accuracy, impact of lumpiness of transmission
- Requires a congestion standard

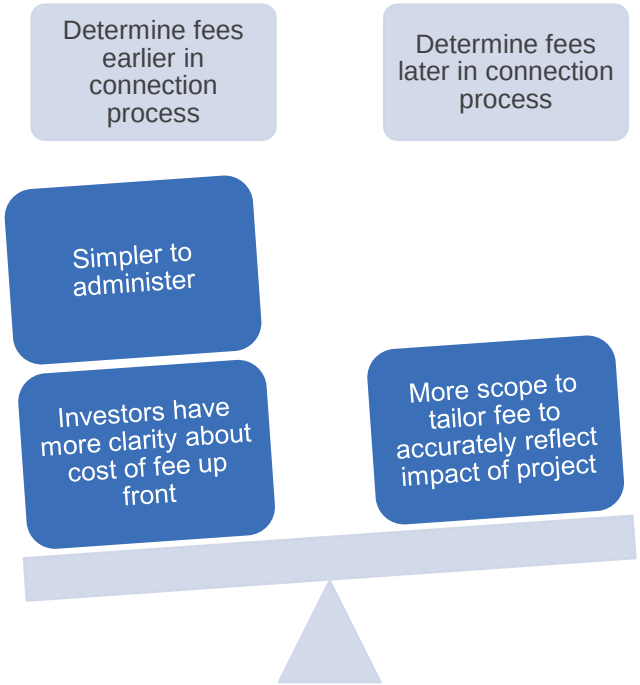
NPV of future congestion on the project

- Estimate forecast difference between LMP and RRP at the proposed location
- Considerations: market modelling requirements, time period, incorporation of any mitigation initiatives

NPV of future congestion on all parties as a result of the project

- Estimate impact on forecast congestion at all connection points
- Sharper incentives than if only reflecting impact on individual project
- Considerations: requires ISP-style assessment for each new connection

INTERACTION WITH THE CONNECTION PROCESS



- Propose to publish information for a set of ‘standard projects’ at a given location (e.g. 100 MW wind and 100 MW solar)
  - Provides a comparative tool, although project-specific costs could be different
  - Variability of fees will depend on what costs we are trying to reflect – further modelling required
- Connection fees are likely to increase as more plant connects at a given location (reflecting increased congestion)
  - Do project developers require more visibility of other projects in the vicinity? Do we need a queue?
  - How does the process fit with batching?

PARTIES SUBJECT TO THE ACCESS REGIME

QUESTIONS FOR DISCUSSION – PARTIES SUBJECT TO THE ACCESS REGIME

Who is subject to the access arrangements (e.g. connection fees)?

- Previous access reviews have proposed scheduled and semi-scheduled market participants (including scheduled loads)
- System strength framework includes generators >5MW, however this may go beyond what is able to be reasonably derived from ISP modelling. Should non-scheduled generators be addressed in a separate review?

Are DNSP connected generators included? If so, how?

- Preference to avoid distorted incentives would suggest DNSP connected generators should be included.
- If so, is it appropriate for status to be determined by reference to generator's applicable transmission node identifier (TNI) code or should the framework attempt to reflect distribution level congestion?

What happens to dual function assets?

- Is it appropriate to use the aggregated output profile to calculate a dual function asset's congestion impact?

What happens if a market participant modifies an existing connection?

- Grandfathered access for portion of asset that was commissioned when regime takes affect, any additional access requirement is subject to the new arrangements?

NEXT STEPS

TRANSMISSION QUEUE - KEY MATTERS FOR CONSIDERATION GOING FORWARD

- Nature of the right conferred by queue position
- Incorporating queue position into dispatch
- Process for allocating transmission queue positions
- Role of auctions
- Role of safety valve

What matters would you like to focus on in the next session?

NEXT STEPS

Date	Description
28 July 2022	Initial discussion of Group 1 issues
11 August 2022	Combined session - Review inputs and assumptions for NERA's modelling
18 August 2022	Initial discussion of Group 2 issues
September 2022	*Review outputs of NERA modelling*
1 September 2022	Group 1 working papers
15 September 2022	Initial discussion of Group 3 issues Group 2 working papers
29 September 2022	Group 3 working papers (as necessary)
October 2022	*Release interim report (date to be confirmed)*