

CONNECTION TO DEDICATED CONNECTION ASSETS

STAKEHOLDER WEBINAR

7 JULY 2020

AEMC

Agenda

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1. Introduction and ground rules – David Feeney *(5 mins)*
 2. Welcome – Merryn York *(5 mins)*
 3. Background and overview of AEMC strawman – Andrew Truswell *(15 mins)*
 4. Q&A #1 *(20 mins)*
 5. DCA connections and connection agreements – Martina McCowan *(15 mins)*
 6. Performance standards – David Bones (GHD) *(10 mins)*
 7. Q&A #2 *(20 mins)*
 8. Close and next steps
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Format for the webinar

- You will have the option to make comments or ask questions via the Q&A function on the right hand side of your screen
- In the Q&A area please first indicate whether you are asking a question or making a comment, then add your remarks, and then finally please include your name and organisation at the end
- We will attempt to answer all questions during the scheduled Q&A sessions – if we don't get to your question during the webinar, we will follow-up after the event
- Comments can also be made during the Q&A sessions. Where possible, and time permitting, participants will be invited to present their comments – if this happens, your mic will be taken off mute, and you will be asked by the presenter to make your comment

WELCOME

MERRYN YORK – ACTING CHAIR

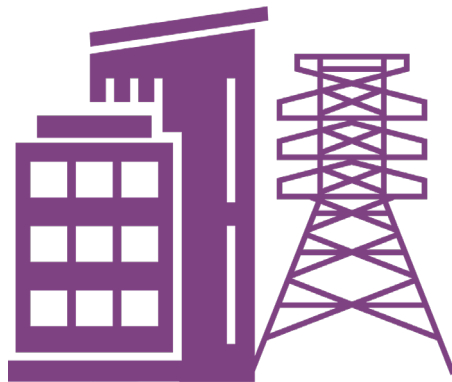


BACKGROUND AND OVERVIEW

ANDREW TRUSWELL – DIRECTOR/PROJECT SPONSOR

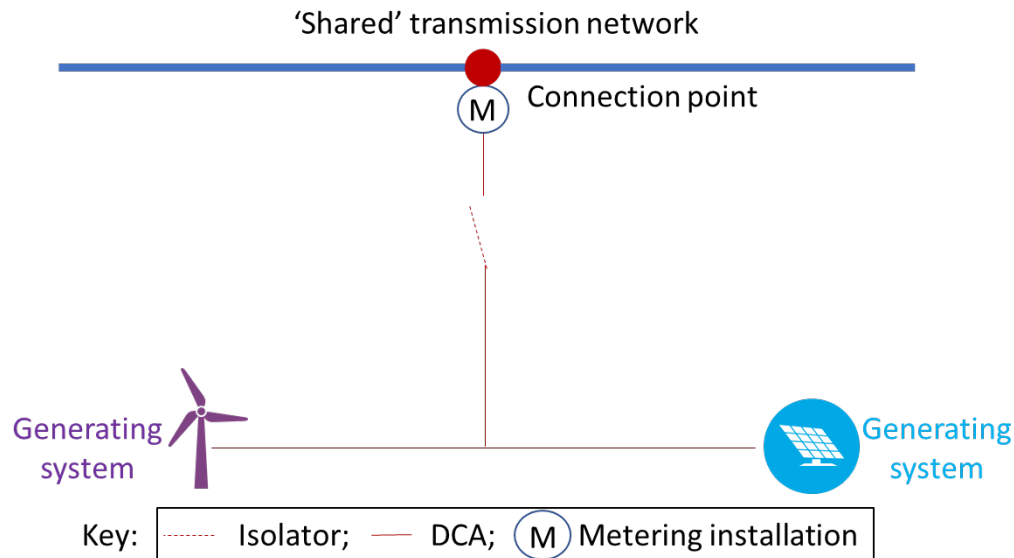
Background

- The concept of Dedicated Connection Assets (DCAs) was introduced as part of the Transmission Connection and Planning Arrangements (TCAPA) rule change
 - Final determination 23 May 2017
 - Connection elements of the rule commenced on 1 July 2018
- The TCAPA connection arrangements do not apply in Victoria
- The current DCA rule change request was received from AEMO on 3 January 2020
 - Consultation paper published on 5 March 2020



TCAPA provided for third-party access to DCAs but no detailed arrangements to facilitate this

AEMO's rule change request



- AEMO considers the current DCA framework to be 'unintentionally unworkable'
- Lack of clarity regarding the application of key NER requirements where there is more than one proponent in an 'identified user group' (i.e. connected by the same DCA)

AEMO's rule change request – case for change

AEMO suggested the following issues inhibit the sharing of DCAs:

Performance standards

- Issues with negotiation of a shared performance standard; requirement to re-open a connection agreement if subsequent parties want to connect
- Difficult for AEMO and the AER to monitor and enforce compliance; potential disconnection of multiple systems

Settlement and metering

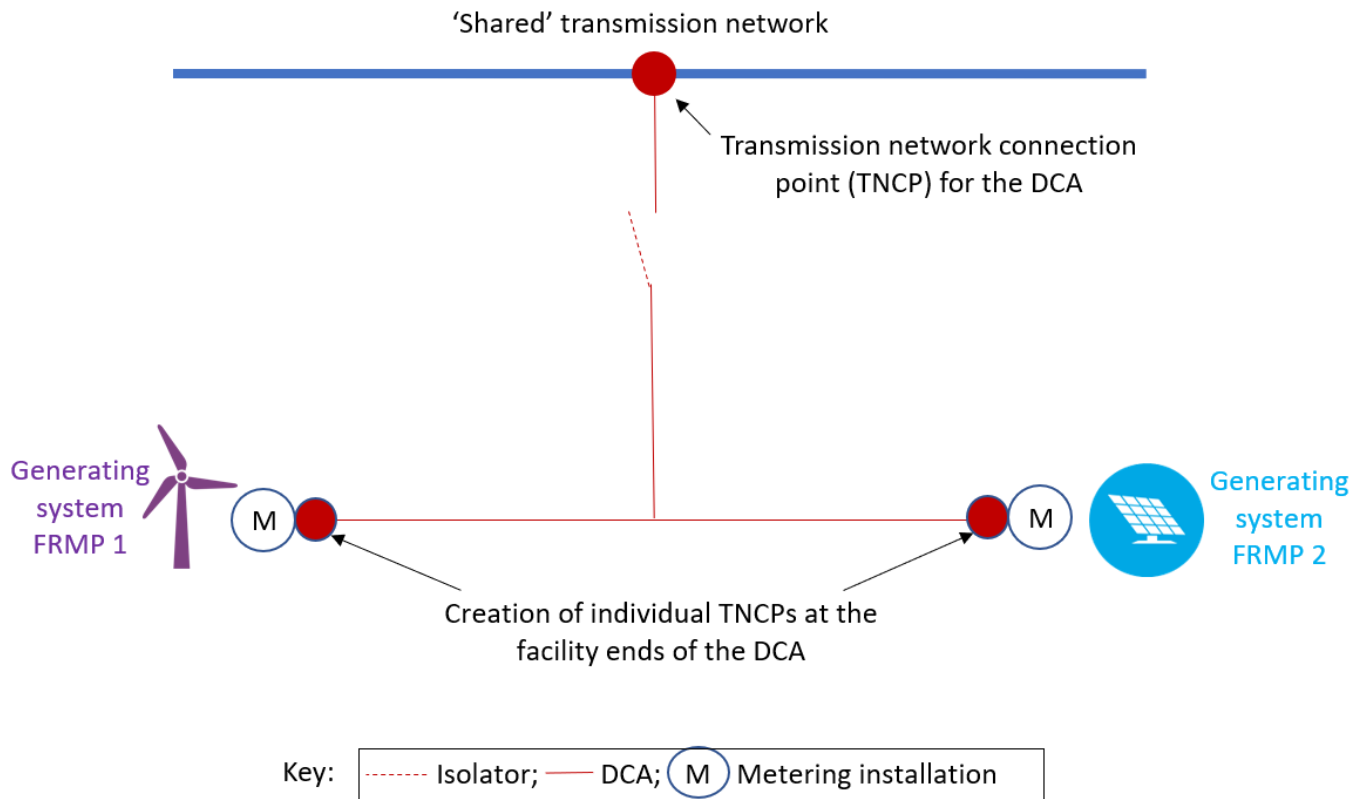
- Absence of a metering installation for each connected facility prevents individual settlement

Loss factors

- Inability to determine individual loss factors means that Transmission Loss Factors will be based on the combined energy profile of the identified user group

AEMO also requested that the AEMC revisit the appropriateness of the distinction between 'small' and 'large' DCAs, including the implications for the access framework

AEMO rule change request – proposed solution



Stakeholder submissions to consultation paper

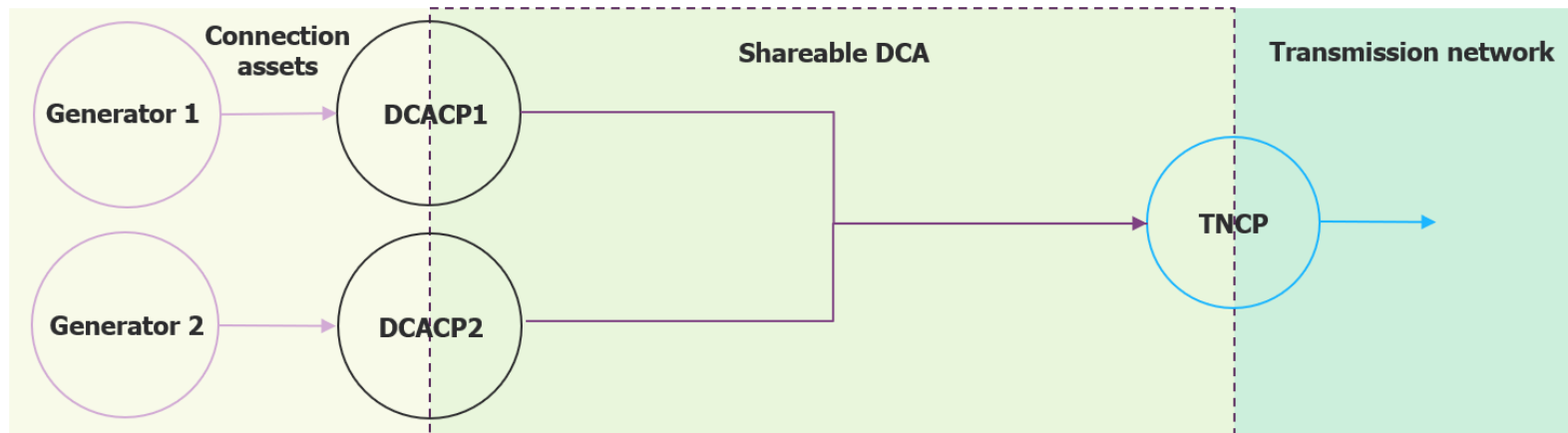
- We received 17 submissions to the consultation
- The vast majority of stakeholders supported the intent of the rule change
- However, most did not support the establishment of Transmission Network Connection Points (TNCPs) at the facility ends of DCAs
 - Many stakeholders instead suggested the creation of a new type of connection point e.g. a 'child connection point' or 'DCA connection point'
- Stakeholders reinforced AEMO's view on the importance of individual settlement
- However, there were mixed views on how loss factors should be calculated and applied
- Similarly, there was no clear single view in response to our questions on performance standards and system strength
 - But developers re-emphasised the importance of not re-opening standards
- A number of submissions supported a broad requirement to offer access to enable better utilisation of DCAs; others suggested that the rights of first-movers must be protected

AEMC emerging thinking – case for change

- The intention of the TCAPA rule was to leave the allocation of responsibilities to the contractual arrangements between the Dedicated Connection Asset Service Provider (DCASP) and the connecting parties
- At the time, we thought multiple parties would rarely seek to connect to the same DCA
- However, there appears to be greater interest in sharing than was expected
 - In particular, for staged projects or if agreed up-front between different shareholders
- Shared DCAs could also be useful in facilitating Renewable Energy Zones (REZs)
 - Either in their own right or as a complement to shared network augmentation
- These developments may justify greater prescription in the rules to clarify the DCA arrangements and address the issues identified by AEMO
 - Our initial view is that such prescriptive arrangements should still be developed consistent with the policy principles underpinning TCAPA (e.g. for contestability)

AEMC strawman model under development

- Developing a strawman model to assess against the status quo and AEMO's proposal
- Key difference is that TNCPs will not be established at the facility end of DCAs
 - Rather, 'DCA connection points' would be created
 - A separate DCA connection point would be established even where there is only one facility initially connected to the DCA, to allow for possible future sharing
- Gives clarity that DCAs remain connection assets, separate from the Transmission Network
 - Will need a concept to cover assets used to connect *to* the DCA connection point



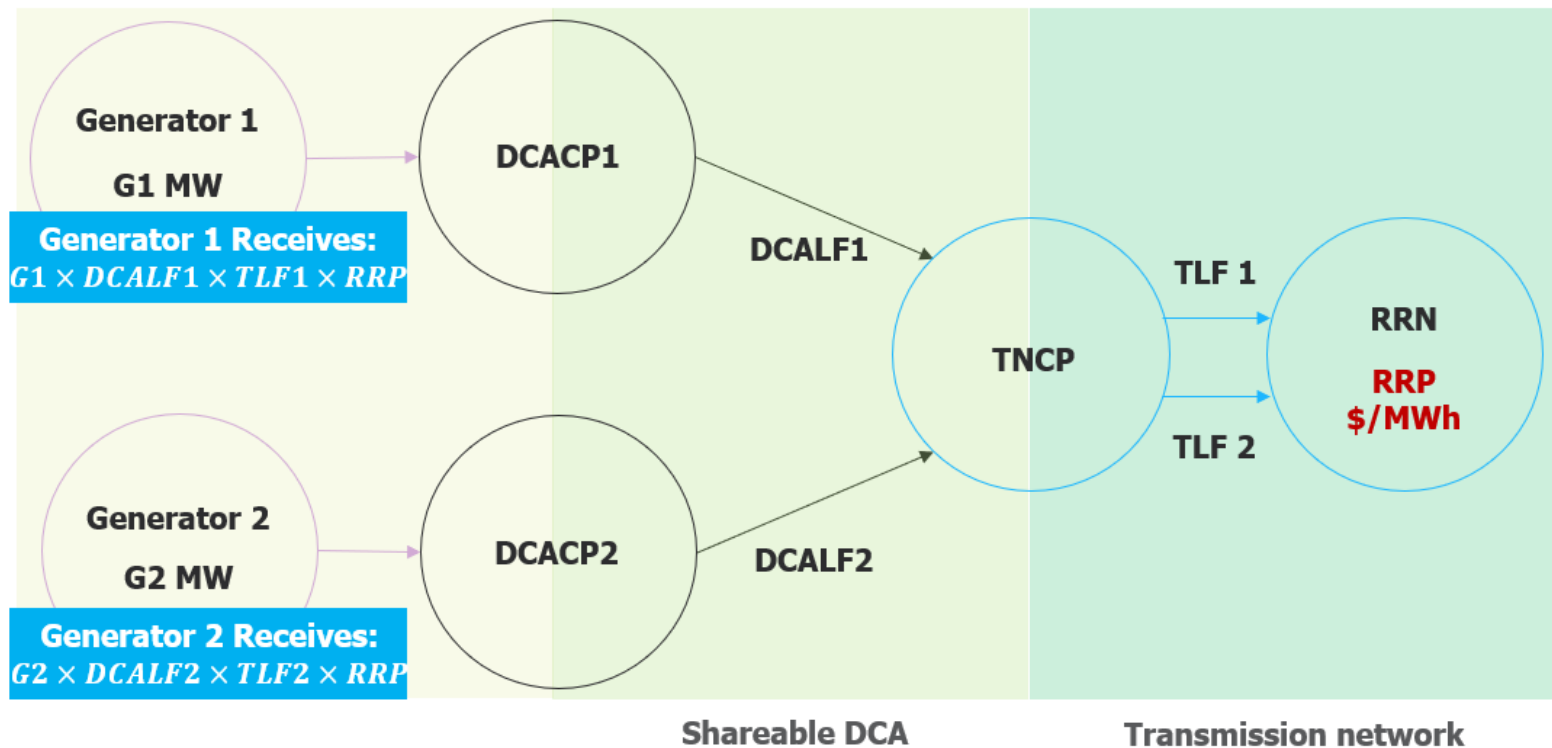
AEMC strawman model – settlement

- The establishment of individual DCA connection points will allow for individual settlement of DCA-connected facilities
- A FRMP would be assigned at every DCA connection point, but would not be required at the TNCP
- Many similarities to the arrangements for registered generators and loads connected to distribution networks
- Metering installations required at DCA connection points
- Metering also likely to be required at the TNCP
 - Would facilitate TUOS charging – envisaged that TUOS would be levied on the DCASP and passed through
 - May also be required for losses calculations, depending on the exact methodology adopted
- Developing an approach for losses based on separate DCA loss factors and Transmission Loss Factors (TLFs)



AEMC strawman model – losses

- Individual DCALFs and TLFs would be calculated and applied for each DCA facility
- Parallels with arrangements for distribution (DCALFs) and pumped storage (TLFs)



Implementation – indicative impacts on the National Electricity Rules

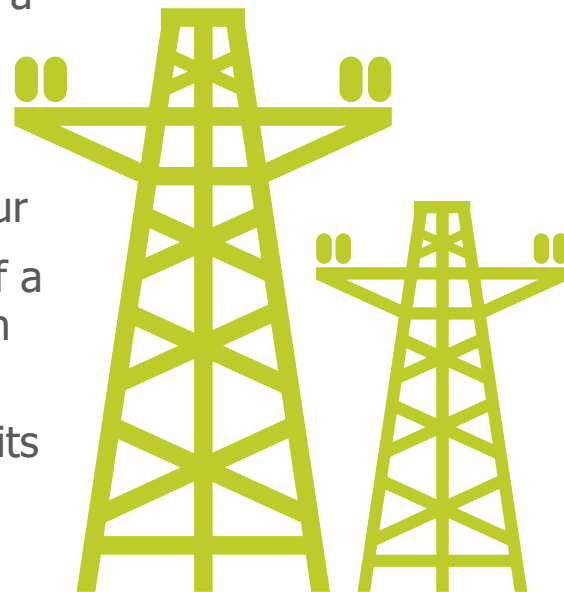
CHAPTER	CHAPTER TITLE	INDICATIVE IMPACTS
Chapter 2	Registered Participants and Registration	Minimal – but note that registered DCASPs will attract expanded obligations elsewhere
Chapter 3	Market Rules	Changes to Settlement, Losses
Chapter 4	Power System Security	DCASPs will now have power system security obligations
Chapter 5	Network Connection, Planning and Expansion	Significant impact on Connection process, Performance standards, System strength, etc
Chapter 6A	Economic Regulation of Transmission Services	Expected to be minimal
Chapter 7	Metering	Expected to be minimal
Chapter 10	Glossary	New and amended definitions
Chapter 11	Savings and Transitional Rules	Transitionals (yet to be considered)

DCA CONNECTIONS AND CONNECTION AGREEMENTS

MARTINA McCOWAN – ADVISOR/PROJECT LEADER

Establishment of DCA connection points

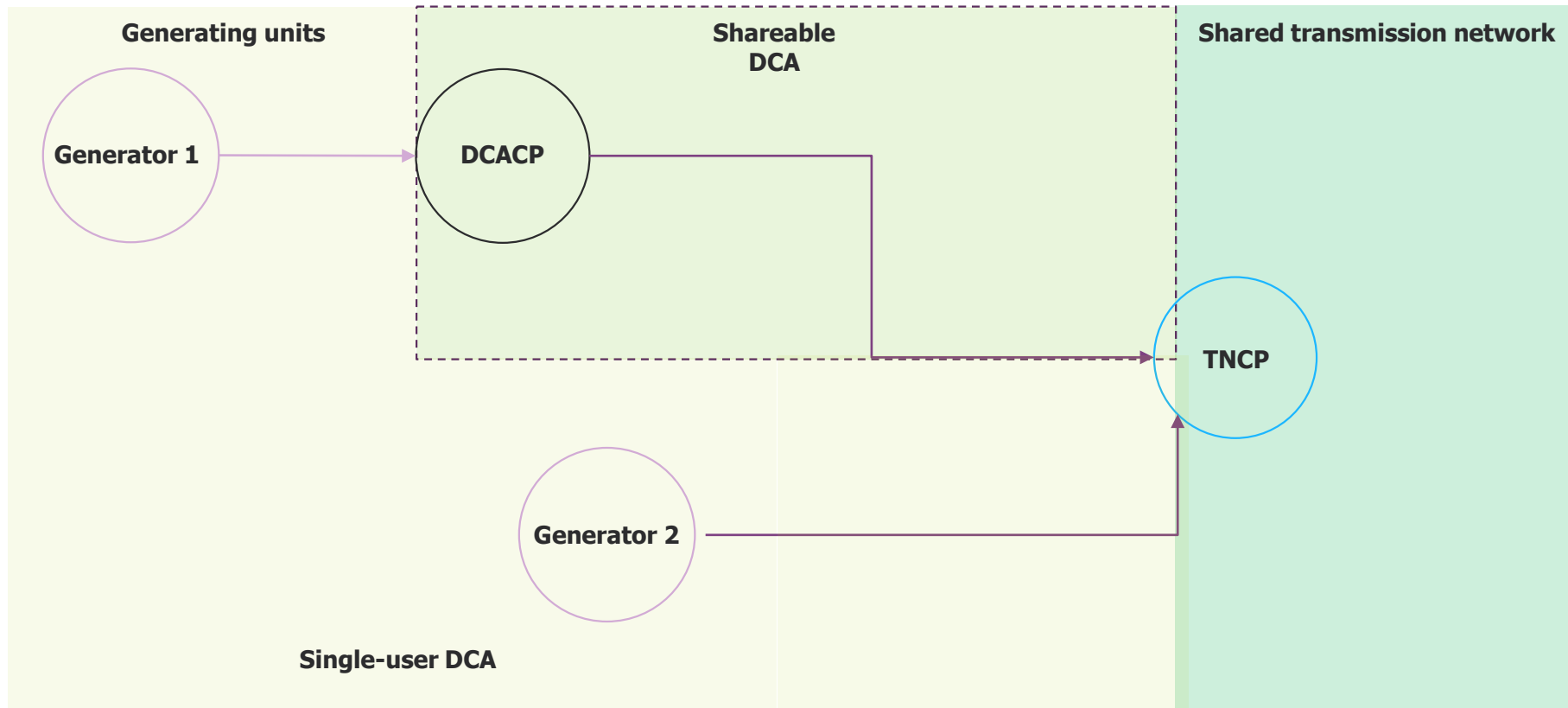
- To facilitate the connection of multiple parties to the same DCA we propose to establish DCA connection points at the point where a facility connects to the DCA, i.e. the 'facility end' of a DCA
- This would ensure that every connecting party has its own connection point with a metering installation, where individual performance standards would apply and settlement would occur
- The introduction of DCA connection points at the facility end of a DCA means that it becomes necessary to define the connection assets between a facility and its DCA connection point
- Under the current arrangements, a connecting party connects its facility to the TNCP either via a large or small DCA. There is currently no concept of connection assets used to connect to a DCA, i.e. the DCA is the connection assets itself



Definition of single-user and shareable DCAs based on a revised threshold

- The approach we're developing would separately identify the assets enabling the connection of a connecting party's facility to its connection point as a 'single-user DCA'. The single-user DCA would either facilitate:
 - the connection of a facility to a DCA connection point on a 'shareable DCA', or
 - the connection of a facility directly to the transmission network with a TNCP at the IUSA
- There will need to be a demarcation between single-user and shareable DCAs, and our current thinking is to use a length threshold
- A short (e.g. 2km or 5km) threshold should be sufficient to cover the equipment necessary to connect a facility to its connection point
- We are considering whether the access threshold should be aligned with this demarcation between single-user and shareable DCAs
 - A threshold lower than the current 30km might better facilitate the sharing and improved utilisation of connection assets

DCA connection configurations



The connection process – Single-user DCA to an IUSA

Under the different DCA connection configurations, different parties would negotiate the connection agreement:

1. Single-user DCA to connect to an IUSA:

- The equipment that facilitates the connection of a facility to the TNCP will be a single-user DCA
- The party who owns, operates or controls the single-user DCA will be the same party as the connecting party and the connection point for a single-user DCA will be the TNCP, rather than a separately established DCA connection point
- A connecting party would enter into a connection agreement with the Primary TNSP, with the connection process under Rule 5.3 applying



The connection process – Single-user DCA to a shareable DCA

2. A combination of single-user and sharable DCAs to connect to an IUSA:

- Where the equipment that connects a facility to the transmission network is longer than a single-user DCA, this will be a sharable DCA
- A single-user DCA will always be required to connect a facility to its DCA connection point on the shareable DCA
- A party that seeks to connect to a DCA would negotiate a connection with the DCASP under a new DCA connection process. This process would need to ensure that AEMO and the Primary TNSP are sufficiently involved so as to mitigate any unintended impacts on the shared network
- As part of the first connection, simultaneous to the process between the first connecting party and the DCASP, the DCASP would also negotiate a connection agreement with the Primary TNSP under Rule 5.3, leading to the establishment the DCA and the TNCP

The connection process – connection agreements

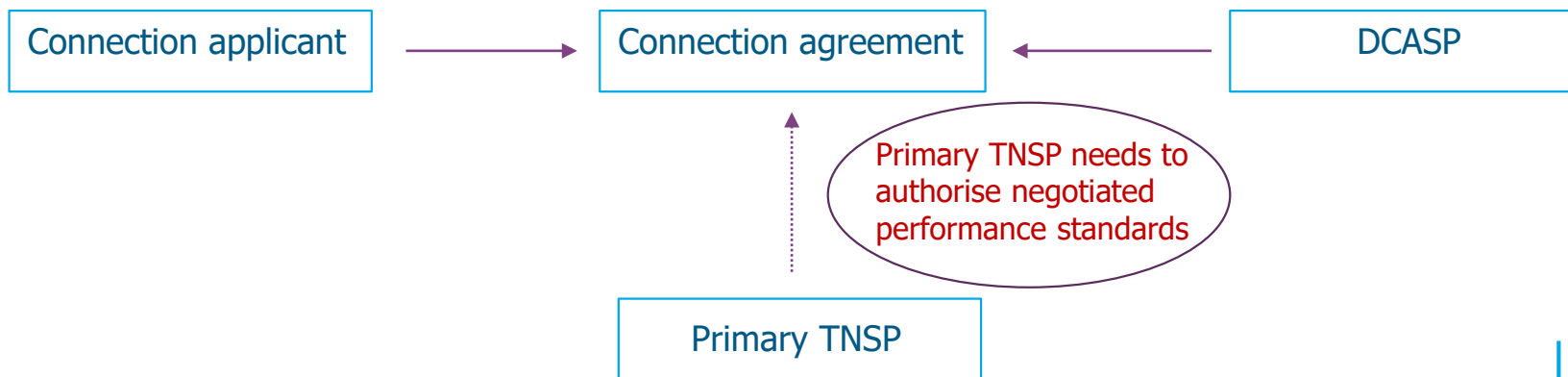
Connection to an IUSA

AEMO advisory matters:
advisory role on acceptability
of some negotiated
performance standards



Connection to a DCA

AEMO advisory matters:
advisory role on acceptability
of some negotiated
performance standards



Performance standards – Shareable DCAs

- At DCA connection points, connected parties would be responsible for compliance with performance standards negotiated under the existing NER schedules 5.2 and 5.3
- The DCASP would be responsible for compliance with system and performance standards across the DCA and at the TNCP, where the DCA connects to the shared network
 - We have engaged GHD Advisory to consider this further
- We do not consider that a 'blended' performance standard, derived from individual performance standards at DCA connection points, should apply at the TNCP. This would only replicate the current problems (e.g. need to re-open the connection agreement at the TNCP) if subsequent parties connect to a DCA

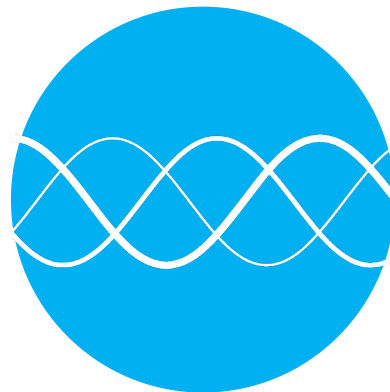


System strength (i)

- The 'minimum level of system strength' framework should continue to apply to TNSPs in its current form
- We are considering two options for how the 'do no harm' framework could be applied in the context of DCAs:
 - Option 1: A generator is responsible to 'do no harm' at its DCA connection point, DCASP is responsible for assessing a new connection
 - In practice, only the Primary TNSP may have the capability to do an assessment and, in any event, would need to determine the effects of a new DCA connection on system strength on the shared network
 - The DCASP would need to provide the Primary TNSP with all necessary information to perform an assessment
 - As the Primary TNSP would have no contractual agreement with the connecting party, any remediation requirements would need to be reflected in the connection agreement between the DCASP and the connecting party

System strength (ii)

- Option 2: The DCASP is responsible to 'do no harm' at the TNCP, the Primary TNSP assesses obligations on the DCASP when there is a new connection to a DCA
 - The focus of a system strength assessment is the impact of a proposed connection on system strength on the transmission network, and the DCASP would be the party that has the most direct relationship with the TNSP at the TNCP
 - Such a model might also enable more coordinated system strength remediation and potentially lower costs for new connecting generators



PERFORMANCE STANDARDS

DAVID BONES – GHD ADVISORY

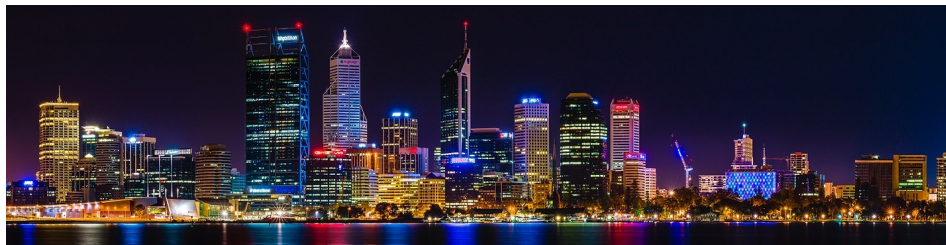


Technical Standards for DCAs

AEMC Stakeholder Workshop

David Bones

7 July 2020



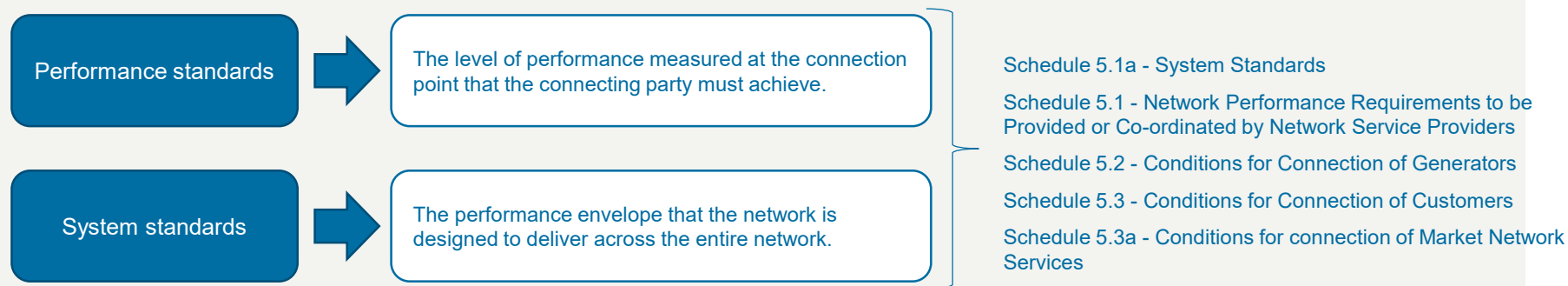
Overview

1. **Our engagement**
2. **Working conceptual model**
 - System standards
 - Performance standards
 - Identifying the gap
3. **Considerations and questions**
 - Principles for defining an approach
4. **Work in progress: which standards can reasonably be relaxed in a DCA context?**
 - Clause by clause analysis
 - Example: system standards that could be relaxed at the facility connection point (or DCA CP) if mutually agreed



Our engagement

Provide advice on the technical performance standards that could be reasonably applied in a DCA context.



Considerations in developing a solution

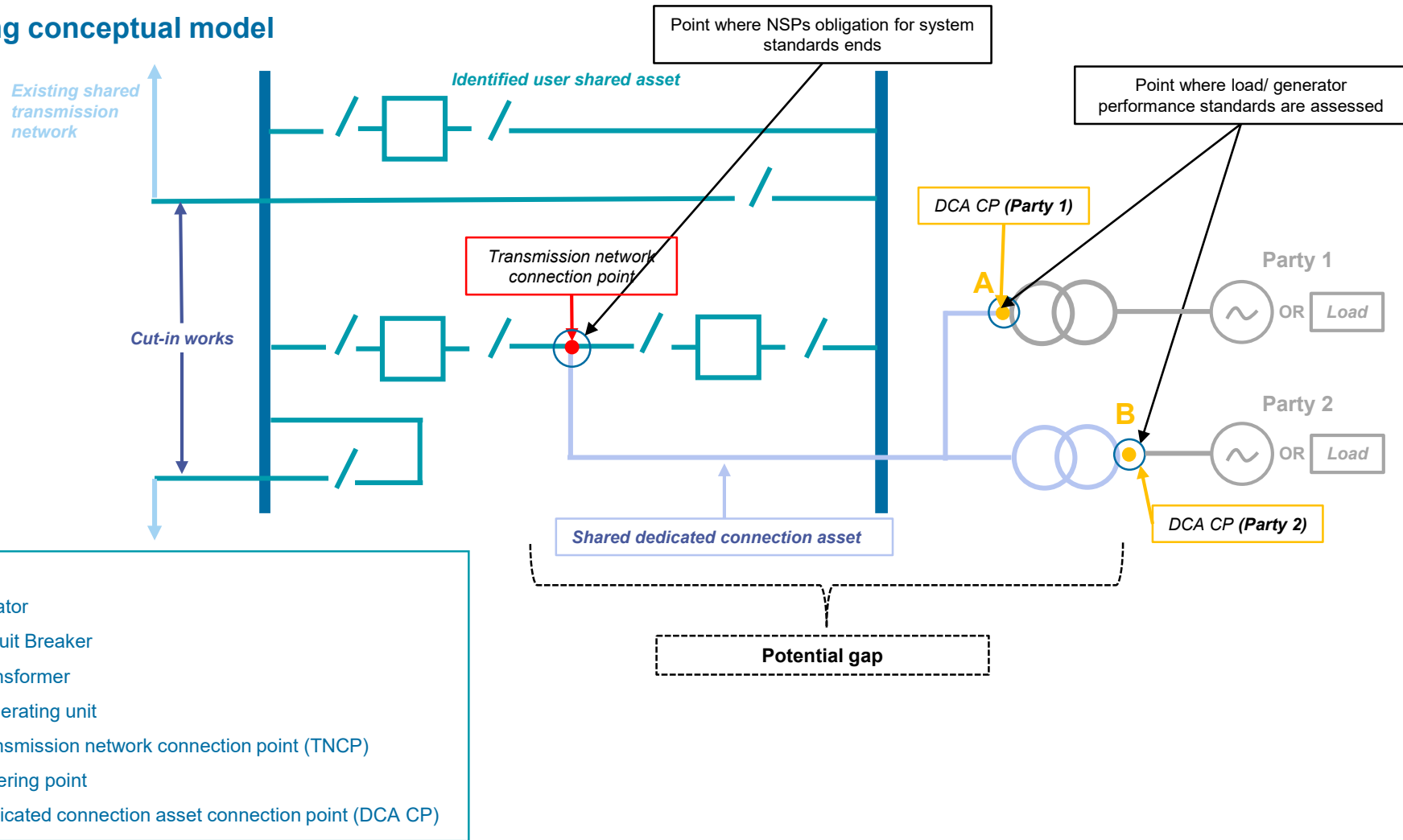
Increase flexibility whilst maintain system security

- Relax or otherwise adjust the level of technical and performance standards without having any adverse effects on the wider shared network or the DCA
- Arrangement for loads and generators connected via DCA be no more onerous than the existing arrangements that specify performance requirements at the TNCP, but that provide appropriate oversight of these assets by AEMO and primary TNSP
- Allow for less prescription where possible

Acknowledge limitations of parties

- Recognize the timing and resource implications for private investors
- At the same time, allow for NSP/AEMO to conduct appropriate system studies
- The performance standards will need to be appropriately negotiated for any new or modified connection to an existing DCA
- Appropriate mechanism for System Strength Assessment for generators and loads connected to DCA

Working conceptual model



Work in progress: Which system standards could be reasonably relaxed?

NER clause	Rule name	Application to DCA CP: Can this clause be relaxed?	Rationale: Reason why this clause could be relaxed or not
S5.1a.1	Purpose	No	Background clause.
S5.1a.2	Frequency	No	Frequency operating standards directly impact system security.
S5.1a.3	System Stability	No	System Stability directly impacts system security.
S5.1a.4	Power frequency voltage	Yes	Providing the voltage remains within system standards at the TNCP the voltage might be allowed to vary outside of this standard at Generator/Load connection points (DCACP) by agreement of all connecting parties.
S5.1a.5	Voltage fluctuations	Yes	Providing the voltage remains within system standards at the TNCP the voltage might be allowed to vary outside of this standard at Generator/Load connection points (DCACP) by agreement of all connecting parties.
S5.1a.6	Voltage waveform distortion	Yes	Providing the harmonic levels remain within system standards at the TNCP harmonic levels might be allowed to vary outside of this standard at Generator/Load connection points (DCACP) by agreement of all connecting parties.
S5.1a.7	Voltage unbalance	Yes	Providing the voltage unbalance remains within system standards at the TNCP voltage unbalance might be allowed to vary outside of this standard at Generator/Load connection points (DCACP) by agreement of all connecting parties.
S5.1a.8	Fault clearance times	No	Fault clearance times may impact on the system security of the shared transmission network.
S5.1.1	Introduction	-	General provisions
S5.1.2	Network reliability	-	Heading for following clauses
S5.1.2.1	Credible contingency events:	Yes	Can be negotiated as part of a Connection Agreement between the DCA SP and connecting parties.
S5.1.2.2	Network service within a region	Yes	Can be negotiated as part of a Connection Agreement between the DCA SP and connecting parties.
S5.1.2.3	Network service between regions	No	Not applicable to DCAs

Work in progress: Which system standards could be reasonably relaxed?

NER clause	Rule name	Application to DCASP: Can this clause be relaxed?	Rationale: Reason why this clause could be relaxed or not
S5.1.3	Frequency variations	No	May impact on system security
S5.1.4	Magnitude of power frequency voltage	Yes	This would align with any agreed voltages as per S5.1a.4. Negotiated as part of a Connection Agreement. Each facility will still be required to be capable of continuous uninterrupted operation in the event of voltage variations due to external faults.
S5.1.5	Voltage fluctuations	Yes	Can be negotiated as part of a Connection Agreement between the DCA SP and connecting parties. System standards need to be met at the TNCP. Allocation method between connecting parties can be determined by DCA SP.
S5.1.6	Voltage harmonic and voltage notching distortion	Yes	Can be negotiated as part of a Connection Agreement between the DCA SP and connecting parties. System standards need to be met at the TNCP. Allocation method between connecting parties can be determined by DCA SP.
S5.1.7	Voltage unbalance	Yes	Can be negotiated as part of a Connection Agreement between the DCA SP and connecting parties. System standards need to be met at the TNCP. Allocation method between connecting parties can be determined by DCA SP.
S5.1.8	Stability	No	May impact on security of the shared transmission network.
S5.1.9	Protection systems and clearance times	No	May impact on security of the shared transmission network.
S5.1.10	Load, generation and network control facilities	No	May impact on security of the shared transmission network.
S5.1.11	Automatic reclosure of transmission or distribution lines	No	May impact on security of the shared transmission network and may damage equipment.
S5.1.12	Rating of transmission lines and equipment	No	Ratings of equipment must not be exceeded.
S5.1.13	Information to be provided	No	Reasonable requirement to inform connecting parties.

How could the relaxed standards be implemented?

Option 1: Mimic the relationship between TNSPs and TNSPs

- Each NSP must meet the system standards across their networks
- As a result there is no specific performance standard in their connection agreement
- AEMO advisory matter for protection (clause S5.1.9)

Option 2: Mimic the relationship between DNSPs and TNSPs

- Each NSP must meet the system standards
- DNSP needs to meet the performance standards specified in Schedule 5.3
- AEMO advisory matter for protection (clause S5.1.9)

Option 3: Mimic the relationship between NSPs and MNSPs

- The MNSP needs to meet the performance standards in Schedule 5.3a
- These are specified and negotiated as part of the connection agreement and qualify the need to meet the system standards specified in S5.1a
- AEMO advisory matter for remote monitoring (clauses S5.3a.4.1) and protection (clause S5.3a.4.14)

Considered these models to assess approaches that might facilitate the flexibility proposed for DCAs

Working recommendations

Location	System Standards	Performance Standard or Technical Requirements
DCA SP requirements at the TNCP	NER Schedule 5.1a and 5.1 apply, i.e. no relaxation.	Not applicable as TNSP to TNSP connections do not specify performance standards beyond meeting the system standards.
DCA SP requirements at the DCA CP	<p>NER Schedules 5.1a and 5.1 can be relaxed.</p> <p>Need a new schedule that applies to DCA SPs to define those elements of the schedules that may be relaxed i.e. defining 'Network Performance Requirements to be Provided or Co-ordinated by Dedicated Connection Asset Service Providers'.</p>	<p>No performance standards applicable for the DCA SP at this point.</p> <p>However the DCA SP negotiates performance standards that apply to connecting parties.</p>
Generator/Load requirements at the DCA CP	NER Schedule 5.1a with agreed relaxations consistent with a new Schedule that applies to DCA SPs defining Network Performance Requirements to be Provided or Co-ordinated by the DCA SP.	<p>Apply NER Schedules 5.2 and 5.3 i.e. no relaxation.</p> <p>Negotiation occurs between the DCA SP and the connecting party (rather than between the TNSP and the connecting party).</p>

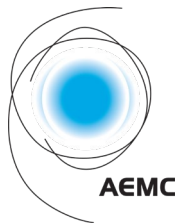


CLOSE AND NEXT STEPS

Close and next steps

- This slide pack will be published on our website
- If participants wish to follow-up on specific issues raised during the webinar, please contact the project leader Martina.McCowan@aemc.gov.au or the project sponsor Andrew.Truswell@aemc.gov.au
- The draft determination is due to be published on 20 August 2020





Office address

Level 15, 60 Castlereagh Street
Sydney NSW 2000

ABN: 49 236 270 144

Postal address

PO Box A2449
Sydney South NSW 1235

T (02) 8296 7800

F (02) 8296 7899