Grid access reform proposal

Presentation to ESB – CEIG's alternative approach to congestion management

24 February 2022

Clean Energy Investor Group

About CEIG

CEIG is the voice for domestic and global renewable energy developers and investors in Australia

Combined, CEIG members own:

- More than 11GW of installed VRE
  - 20% total NEM
  - 50% total clean energy in NEM
- More than 70 power stations
- Portfolio value of around $24B
- Pipeline of more than 18GW

ESB P2025 reform

Main CEIG focus

ESB has set out 4 objectives* for access reform

- **Efficient locational signals for generators** - better signals for generators to locate in areas where there is available transmission capacity incl in REZs.
- **Efficient locational signals for storage and demand side management** - establishing a framework that rewards storage and demand side resources for locating where they are needed most and operating in ways that benefit the broader system.
- **Measures to give investors confidence** that their investments will not be undermined by inefficient subsequent connections.
- **Efficient dispatch** - achieving efficient dispatch by eliminating disorderly bidding.

* ESB, *Transmission access reform – Project initiation paper*, p.12 (Nov-21)

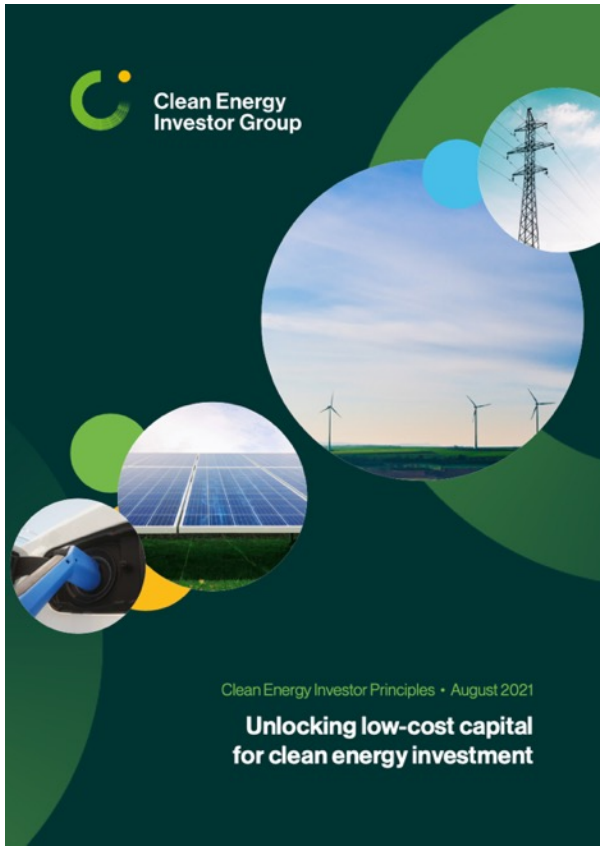
CEIG's alternative proposal to CMM-REZ

Grid access reform proposal

- This is a concept design: we are open to feedback & amendments.
- Alternative to ESB's CMM-REZ that seeks to be consistent with approach adopted in CEIG's Investor Principles

Risk premium in Australian market

- Survey of CEIG Members: 100-250 bps risk premium on cost of equity
- Caused by lack of revenue certainty and excessive risk



Operation of the current NEM

Open access designed to encourage lower marginal cost generation

- Steady thermal load, steady thermal generation
- Need to generate competition
- No guarantee of dispatch

Solving for short-term dispatch problem

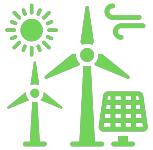
Problem

- Open access ➔ uncertainty around future congestion + volatile MLFs
- No mechanism to allocate spare transmission (Tx) capacity
- Tx investment framework: uncertain timetable for future Tx investment
- Lack of coordination between transmission and generation

Consequence

- High risk premium due to revenue uncertainty & difficulty to predict future revenues
- Inadequate level of committed projects to achieve ISP scenarios

What will the future NEM look like?



NEM quickly transitioning to 100% Renewable Energy

Solving for long-term investment problem

- Energy transition will require large capital deployment (see 2022 draft ISP)
- Renewable generators characteristics:
  - High upfront capital cost: infrastructure cost (through cost capital) becomes more important, energy price less;
  - Near zero marginal cost: if all bidders have near zero marginal cost, no social benefit to dispatching any particular plant ahead of another

Objective: Achieve NEO by avoiding inefficient generation and Tx investment

- Need to minimise total infrastructure costs to achieve least-cost transition for consumers
  - Price lever (lower cost capital): need greater revenue certainty at time of financial investment decision about future ability to dispatch
  - Volume lever (minimise volume of infra built): optimise location of generation and Tx
- Efficient locational signal must be predictable and based on future generation and Tx conditions

Key elements of our proposal

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CEIG's Grid Access Reform – Overview

CEIG is proposing a physical access regime which is designed to apply across the NEM, and within the REZ framework, leading to the following benefits:

- Locally firm, stable, more predictable access rights to Tx network
- Efficient utilisation of Tx network
- Minimise cost of infrastructure investment (generation, storage, Tx)
- Lower cost of capital
- Improved investor confidence

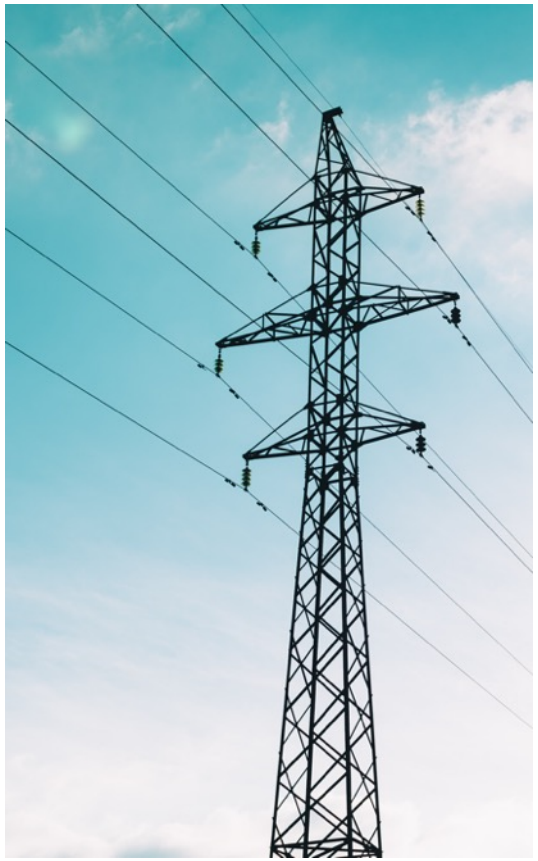
Grid access reform – Key elements

Queueing for curtailment order

- Applies to existing / future ISP Tx
- Allocate access to spare Tx capacity based on a queue
  - If need to decide who to curtail: “last in, first curtailed”
  - Includes protection for existing plants
- Provides access protection for existing plants

Transmission Charges as safety valve

- Applies if no existing or planned Tx capacity
- Generator can fund Tx inv to improve position in queue
- Incentive for storage as substitute to Tx inv



Grid access reform – Key elements

Use Average Loss Factor for settlement purposes

- Improve revenue certainty and predictability to lower cost of capital

Eliminate ‘race to floor’ bidding

- Amend tie-break rule to curtail thermal plants before renewables
  - Retain “physical” dispatch system requirements (e.g. coal plant ramp rates).

Queueing for curtailment order

Why a queue?

- Locational signal to generators about curtailment order if curtailment becomes necessary (*"last in, first curtailed")*
- Applies to spare existing or future centrally-planned (i.e. ISP) Tx capacity

How places are allocated in queue

- Recognition of incumbent access: existing plants receive position '0' in queue;
- First-come first-serve/ auction for new entrants connecting to spare Tx capacity (position '0');
- Once spare Tx exhausted, queue does not prohibit connections
  - Instead, generators receive a high number in the queue
  - Queue order delivers increased predictability of future curtailed risk
- Place in queue cannot deteriorate

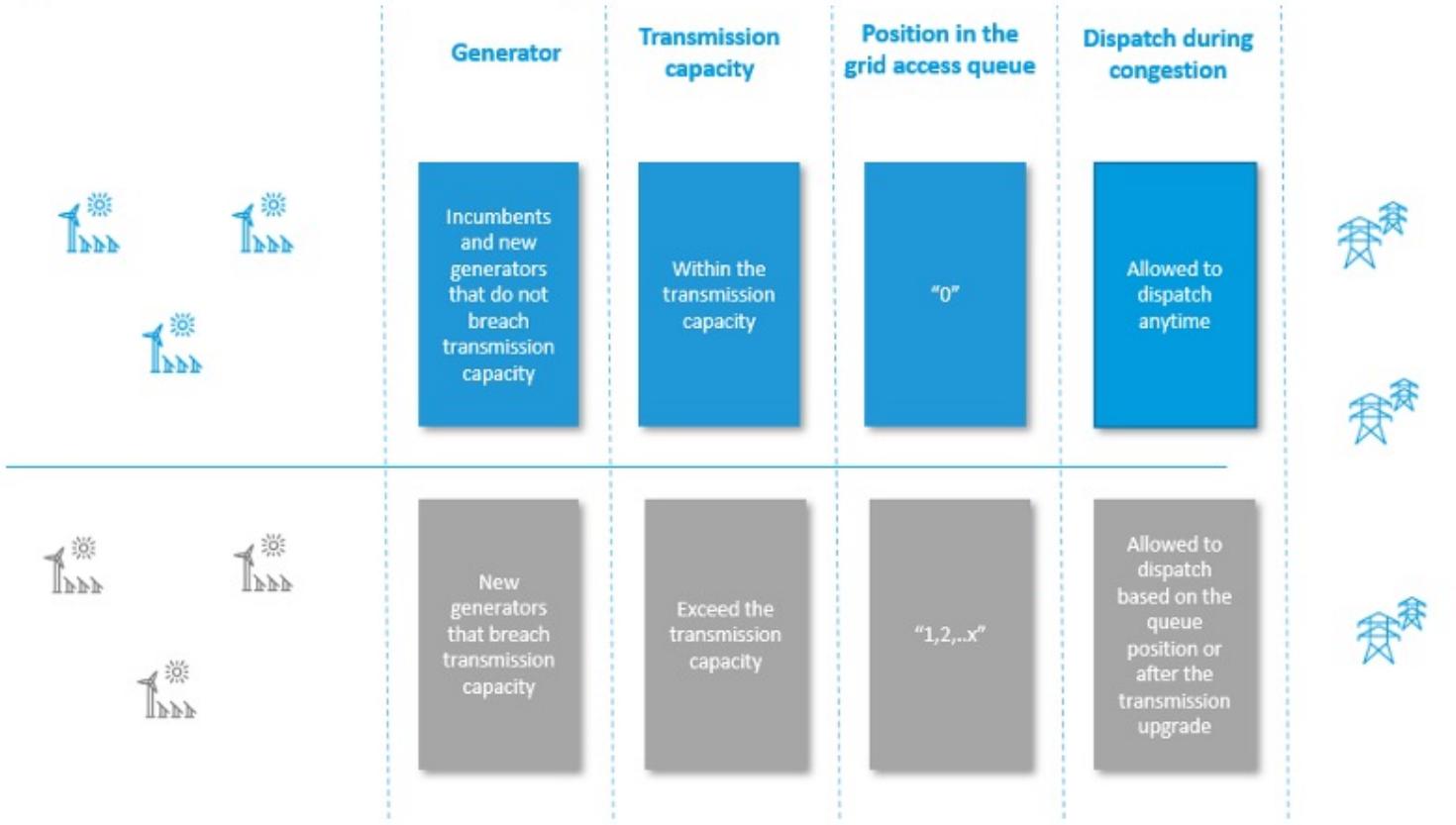
Incorporate queue order into dispatch algorithm

Figure 3.3: Order of Decision Making in Dispatch Order

Source: Castalia

Operation of Tx queue

Figure 3.2: Overview of the Transmission Queue



Source: Castalia

Transmission Charges as safety valve

Why Transmission Charges (TCs)

- New entrant generator can fund Tx investment to improve position in queue
- Efficient locational signal when limited Tx capacity:

  Requires investors to evaluate:
  - Benefits of location with abundant resources but also high position in queue (e.g. ‘5’);
  - TC: cost of transmission network enhancement to gain position ‘0’ in queue

TC features

- No need for RIT-T approval
- Regulated TC price and SLAs to balance negotiating power (generator/ TNSP)
- Incentive for storage as substitute to TC

Thank you

For the latest version of our grid access reform report please contact us or find more information on our website.

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