ENERGY SECURITY BOARD

POST 2025 MARKET DESIGN

PUBLIC WEBINAR

TRANSMISSION ACCESS REFORM CONSULTATION PAPER

26 MAY 2022

AGENDA

- **Welcome and introduction**
- **Objectives & case for reform**
- **Shortlisted models**
- **Trade offs**
- **Q&A**

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TRANSMISSION ACCESS REFORM OBJECTIVES

Investment timeframes	Operational timeframes
The level of congestion in the system is consistent with the efficient level.	*When congestion occurs, we dispatch the least cost combination of resources that securely meets demand.*
1. Investment efficiency: Better long-term signals for market participants to locate in areas where they can provide the most benefit to consumers, considering the impact on overall congestion.	3. Operational efficiency: Remove incentives for non-cost reflective bidding to promote better use of the network in operational timeframes, resulting in more efficient dispatch outcomes and lower costs for consumers.
2. Manage access risk: Establish a level playing field that balances investor risk with the continued promotion of new entry that contributes to effective competition in the long-term interests of consumers.	

4. Incentivise congestion relief: Create incentives for demand side and two-way technologies to locate where they are needed most and operate in ways that benefit the broader system.

CONSEQUENCES OF FAILING TO ACT ON ACCESS REFORM

Unnecessary investment in generators and storage that are poorly located to be dispatched.

Subsequent connections can render neighbouring projects unviable.

Investments are poorly targeted

Investment is more expensive than it should be because the additional risk and uncertainty adds to the cost of capital faced by generation investors.

Investments are more expensive due to systemic risks

Storage can help to reduce congestion costs, but it is not paid to do so.

Storage providers lose a potential value stream, and the NEM loses an important tool to manage congestion.

Lost opportunity to benefit from storage

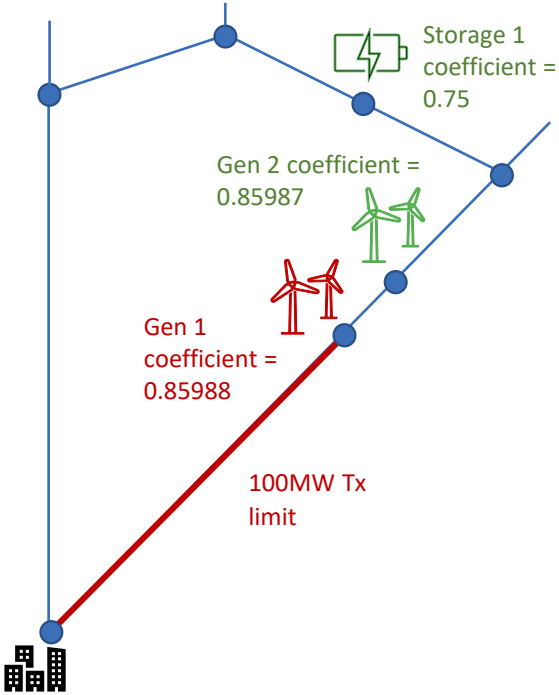
If generators and storage locate in the wrong place, a larger transmission system is needed to transport energy from sources of supply to load.

Additional transmission expenditure

In operational timeframes, more expensive combinations of generation and storage are being used to meet demand than is necessary.

More expensive dispatch outcomes

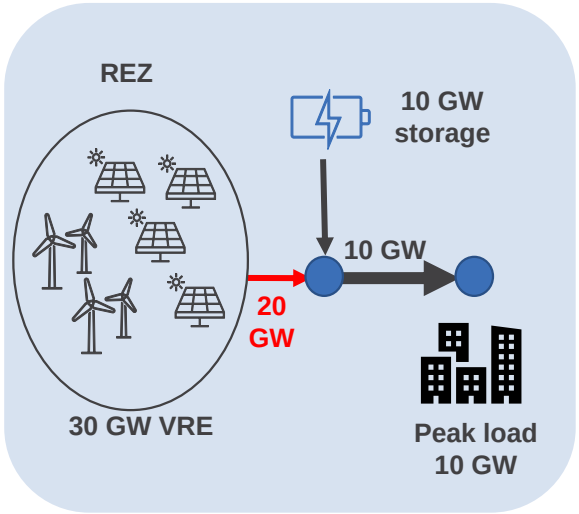
“WINNER TAKES ALL” DISPATCH AMPLIFIES INVESTOR RISK



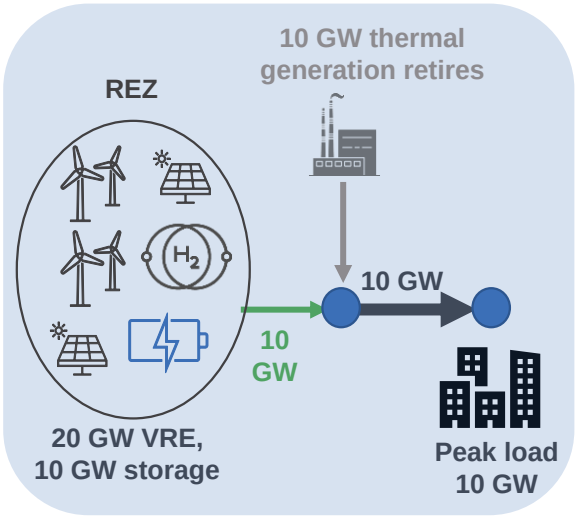
- Consider 3 market participants, each with availability of 50 MW, that are subject to a transmission limit of 100MW.
- If all curtailed generators bid -$1000, NEMDE will maximise the output of low cost generation by dispatching the generators that contribute least to the constraint
  - Even if the coefficients are virtually identical
- Incumbents cannot change their location to optimise their coefficient, but prospective projects can.
- Unique and opaque feature of NEM design.
- In contrast, consider two retail competitors selling virtually identical products in close proximity
  - Shops - customers disperse between them both
  - Generators (with congestion) - dispatch algorithm selects the one with the lowest participation factor.

WE NEED TO GIVE STORAGE & FLEXIBLE LOAD THE RIGHT SIGNALS

Outcomes under current market design



What we actually want



- At present, we treat batteries as if they were generators. We reward them for:
  - Locating where there is plenty of transmission capacity
  - Discharging during high prices, even if it makes congestion worse
- But batteries have a broader range of capabilities
  - Lost opportunity to reduce congestion, maximise VRE output
- Loads are not rewarded for locating in places where they can help to alleviate congestion.

More investment needed to deliver same CO_2, reliability outcome.

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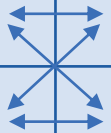
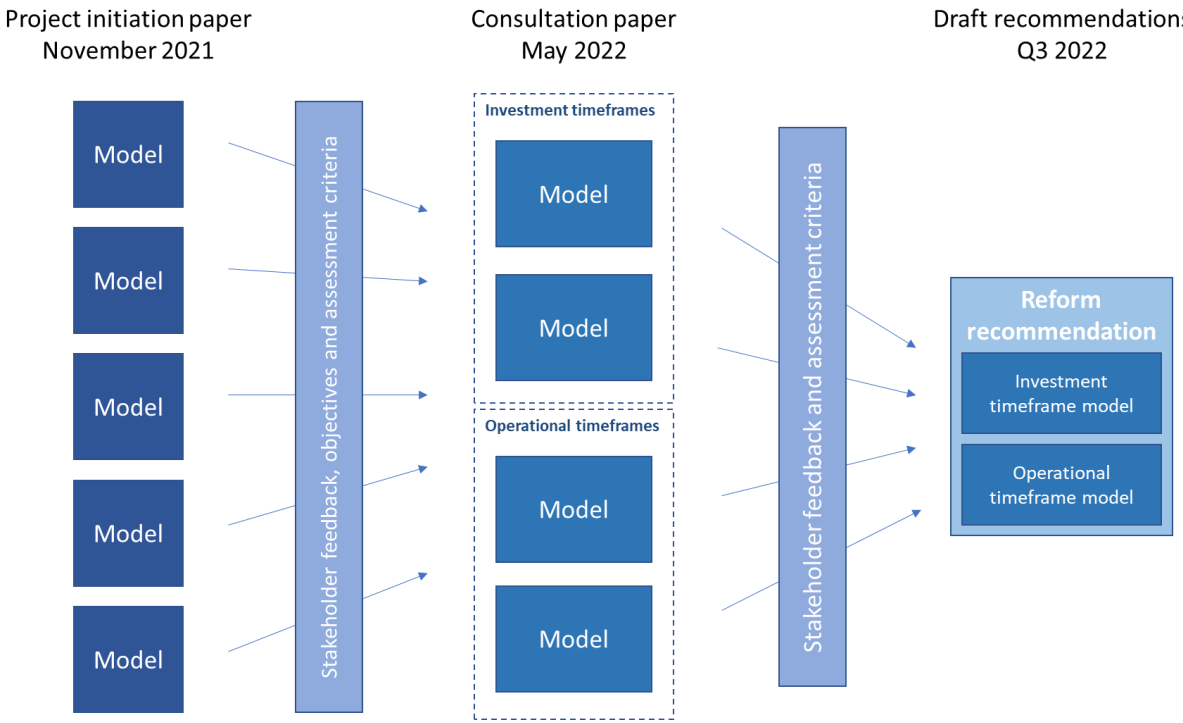
OVERVIEW OF MODELS

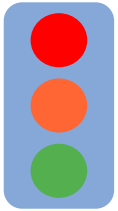
Investment timeframes	Operational timeframes
Congestion zones with connection fees Investors receive clear up-front signals about which network locations have available hosting capacity.	**Congestion management model with universal rebates** Establishes a single, combined-bid energy and congestion market.
Transmission queue Establish a transmission queue that confers priority rights (either to allocate rebates in the CMM or to establish who buys and sells congestion relief in the CRM).	**Congestion relief market (CRM)** Changes to the market and settlements to provide separate revenue streams for energy and congestion relief.



PROCESS FOR REFINING MODELS



CONGESTION ZONES WITH CONNECTION FEES



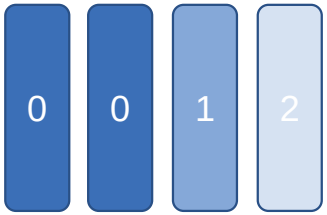
Why we recommended this model

- Clear, upfront signals to investors re efficient location decisions
- Provides more nuanced signals than CMM-REZ, where participants either receive rebates or do not
- Able to be combined with a range of operational timeframe models
- Integrates with jurisdictional schemes as zones can be identified having regard to State REZ schemes
- Cost associated with locational signal is known at the time of investment
- Addresses stakeholder concerns re risk to generators who do not receive rebates

Key matters to be resolved

- What form of incentive should be used to influence generator location decisions?
- If it's connection fees, how are they calculated?
- What do generators get in return for paying a fee? (Note: this will affect cost of fee.)
- What happens to revenue paid by generators?
- What methodology is used to calculate the efficient hosting capacity of the network for each zone?
- How does this methodology reflect differences in the output profiles of different generator types?
- What happens when multiple generators seek access to the same part of the network?
- Who should be responsible for administering the framework?

TRANSMISSION QUEUE



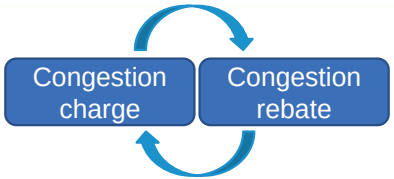
Why we recommended this model

- Gives investors a tool to manage their access risk.
- New entrants wishing to connect in congested locations may do so, however they face the associated congestion risk.
- Use of auctions to allocate queue positions in cases where the network is oversubscribed helps to overcome challenges associated with connection queues in other jurisdictions.
- Able to provide more nuanced signals than CMM-REZ.
- Integrates with jurisdictional schemes as queue positions can be made available having regard to State REZ schemes

Key matters to be resolved

- How does a generator's queue position manifest in operational timeframes?
- What methodology is used to calculate the efficient hosting capacity of the network (for the purposes of establishing whether initial queue positions are available)?
- Can queue positions can be traded?
- Should energy storage be subject to the same queuing terms as generators?
- How does the model encourage efficient retirement decisions for end-of-life generators?
- What happens to auction revenue?

CMM WITH UNIVERSAL REBATES



Why we recommended this model

- Efficient outcomes in operational timeframes
- Incentives for storage and scheduled load to relieve congestion
- Addresses stakeholder concerns re risk to generators who do not receive rebates
- Cheaper to implement than alternatives

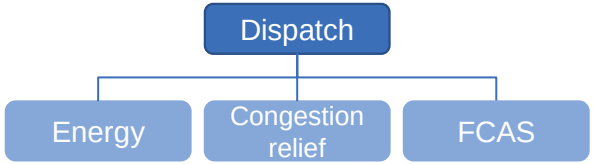
International context Locational marginal pricing* has been introduced into a number of jurisdictions worldwide.

Key matters to be resolved

- What metric should we use to allocate rebates between generators?
  - Should we remove the “winner takes all” characteristics implicit in the current specification?
  - Need for modelling of participant impacts
- Should we adapt the model to preclude peaking generators from receiving rebates when the RRP is low?
- How can this model better support generator contractual arrangements for congestion relief?

* ESB proposes a version of LMP where settlement residues (difference between LMP and RRP) are returned to generators.

CONGESTION RELIEF MARKET



Why we recommended this model

- Efficient outcomes in operational timeframes
- Transparently rewards parties who alleviate congestion
- Gives market participants autonomy over whether they choose to participate
- Provides a clear path for developing supporting contractual arrangements.

Key matters to be resolved

- What key attributes should the ESB seek to preserve as it works out how the dispatch algorithm should solve in the congestion relief market?
- What implementation costs are involved – both for AEMO and market participants?
- Should we adapt the model to remove the “winner takes all” characteristics implicit in the current specification?
- What are the consequences of the congestion relief market in terms of bidding incentives?
- Should we adapt the model to preclude out of merit order generators from selling congestion relief when the RRP is low?

ACCESS REFORM SUPPORTS AND STRENGTHENS RENEWABLE ENERGY ZONES

Access reform strengthens incentives for new entrants to locate and participate in REZs by:

Giving REZ participants confidence that their investment case will not be undermined by subsequent inefficient investment decisions outside the REZ.

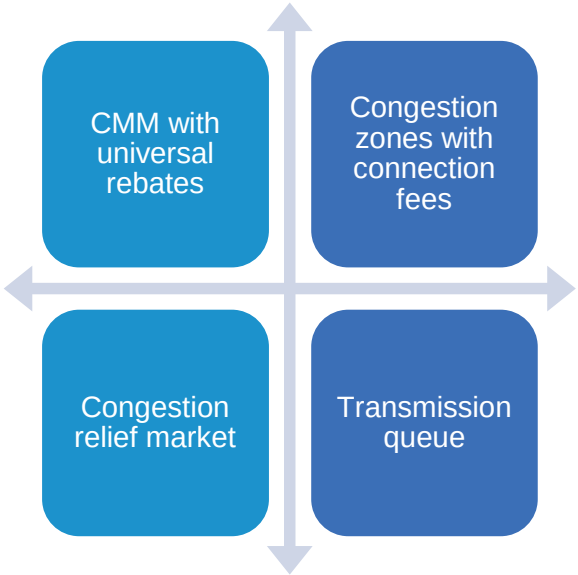
- This is especially important if we want investors to pay to be in a REZ.

Removing opportunities for subsequent connecting generators to free-ride on REZ investments without contributing to them.

Promoting the efficient use of REZ infrastructure by creating a market design that rewards storage providers for alleviating transmission congestion and providing firming services for renewable generators.

INTEGRATION WITH STATE REZ SCHEMES

- Operational timeframe models needs to be applied consistently across the NEM.
  - Affect dispatch and/or settlements
- Do not clash with REZ schemes as apply in a different timeframe.
- Reforms create new revenue stream for storage, load that will encourage them to locate in REZs.



- Investment timeframe models will reinforce REZ schemes by design.
- See connection fees at levels to encourage/discourage investment in line with jurisdictional schemes
- Assign queue positions to encourage/discourage investment in line with jurisdictional schemes
- Role for State planning bodies in determining locational signals?

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TRADE OFFS

Design decisions will lead to trade-offs.

The consultation paper seeks your feedback (directly and indirectly) on the preferred balance between these trade-offs.

We have highlighted five for discussion today:

- Flexibility vs predictability
- Cost vs investment certainty
- Duration of access rights
- Simplicity vs accuracy
- Secondary objectives

*Most relevant to …**investment timeframes***

*… **operational timeframes***

LIVE SURVEY

1. To participate in the live survey navigate to the Menti link provided in the webinar chat OR go to www.menti.com and enter the code **8140 0719**.
2. You'll be asked several questions where you'll need to either:
    - Select a trade-off position on a sliding scale
    - Rank options - in priority order
3. All answers are anonymised and will be shared iteratively throughout the discussion.
4. If you're having difficulties with viewing or voting please let us know.

FLEXIBILITY VS PREDICTABILITY

High level of unfettered access allowing new entrants to connect. New entrants can impose congestion costs on others.

For investors to know how much congestion they will face, they need to know how much generation will connect in their part of the network.

COST TO CONNECT VS INVESTMENT CERTAINTY

Low cost to connect, but with less certainty regarding generator's ability to access the market.

High level of certainty with an access right that does not degrade over time

WHAT IS THE PREFERRED DURATION OF ACCESS RIGHTS?

Less costly – generator does not pay for access and does not receive access rights

More costly – Long term access rights provide certainty over lifetime of asset

SIMPLICITY VS ACCURACY

A simple approach would be quicker to administer and be more transparent.

High level of accuracy requires greater complexity of congestion forecasting but could improve cost allocations and avoid over/under-payment.

SECONDARY OBJECTIVES- WHAT IS YOUR PREFERRED RANKING?

Operational timeframe models can be designed to achieve different objectives:

1. Maintain status quo outcomes so that existing generators are no worse off financially than under the status quo.
2. Sharing of risks so that financial impacts are shared between constrained generators rather than creating ‘winner takes all’ outcomes.
3. Similarity to actual dispatch so that generators can reduce the basis risk between the regional reference price (which retailers/customers pay) and the locational marginal price (which generators pay when a constraint is binding).
4. Increased certainty for generators with priority access rights to incorporate the transmission queue model i.e. generators with a ‘0’ position would have greater certainty than generators with a ‘1, 2, 3…’ position.
5. Simplicity and transparency so that the algorithm and its outcomes are easy for stakeholders to understand.

Q&A