Congestion management Technical Working Group

Staff working paper – Breakdown of options for managing congestion

1. Context

To take the TWG's consideration of the models forward, ESB staff propose:

1. Break down access reform into its component concepts in order to develop a set of core features that need to be addressed.
2. Describe how the various alternative models and the CMM fulfils each core feature
3. Work through the pros and cons of the various options for addressing each feature
4. Mix and match the various options to develop a model.

This paper sets out, for discussion, the ESB's initial attempt to complete tasks 1 and 2.

2. Core features of access models in investment timeframes

	Feature	CMM-REZ adaptation	Preferential dispatch	Locational connection fees	Connection fees based off long term plan
1	Nature of incentive *How does the model incentivise efficient investment decisions/disincentivise inefficient investment decisions?*	Generators receive/do not receive a congestion rebate.	Congested generators with tied bids are dispatched in order of marginal cost (subject to ramp rates, min. gen requirements) and then queue order.	New connecting generators are required to do low harm to pre-existing generators.	New connecting generators pay a connection fee that reflects the long run incremental cost at their location on the network.
2	Identifying efficient connection locations *How do we determine which parts of the network should be subject to incentives/disincentives to connect?*	Locations where rebates are available are identified via an enhanced transmission planning framework. Above cap, market participants form view on what level of congestion they are likely to be exposed to.	Market participants form view on what level of congestion they are likely to be exposed to.	Do low harm assessment conducted during connection process determines connection cost.	Connection fees are determined via an enhanced transmission planning framework, updated annually.
3	Approach to managing new connections	Rebates are made available via some form of tender process – either a REZ tender, or a system-wide tender to	Queuing mechanism determines preferential dispatch order.	Queuing mechanism determines order in which "harm" is assessed.	Connection fees are determined via an enhanced transmission

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	How do we deal with different proponents seeking connection at different times?	allocate any remaining hosting capacity.			planning framework, updated annually.
4	*Treatment of pre-existing generators* *What do we do about generators who are already there? How do we strike the right balance between new entrants and incumbents?*	Incumbent generators receive rebates.	Incumbent generators are treated as equal first in the connection queue.	Incumbent generators have already connected and hence do not pay connection fees.	Incumbent generators have already connected and hence do not pay connection fees.
5	Efficient retirement decisions *How do we make sure that the framework encourages efficient retirement decisions for end-of-life generators?*	After a pre-determined period, incumbent generators not taken into account for purposes of deciding where new rebates are available. Incumbents still receive rebate, however as new connecting generators may also receive rebates, the rebate revenue is shared among more rebate holders.	*For discussion*	*For discussion*	Fees paid by subsequent connections determined in accordance with efficient long term development of the power system.
6	Maximising hosting capacity of available transmission *How do we maximise the potential hosting capacity of the network by encouraging investments that enhance hosting capacity?*	Option for rebates to be made available above planned levels to parties that agree to fund measures that increase hosting capacity.	Opportunity for generators to improve their position in the queue by agreeing to fund measures that increase hosting capacity.	New connections can negotiate with TNSPs to fund measures that mitigate their impact on existing generators in return for a lower connection fee.	*For discussion*
7	Signals for congestion relief *How do we create incentives for demand side and two way technologies to locate where they provide the most benefits to the system?*	Demand side and two-way technologies benefit from lower prices in the presence of congestion. For batteries, this means they can access greater spreads by storing energy until the congestion has passed.	Opportunity for generators to improve their position in the queue by agreeing to fund storage.	Parties that help to alleviate congestion could receive waiver (or negative) connection fee. Requires measures to ensure that parties behave as intended in operational timeframes.	Parties that help to alleviate congestion could receive waiver (or negative) connection fee. Requires measures to ensure that parties

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					behave as intended in operational timeframes.
8	Integration with jurisdictional schemes *How does the access scheme integrate with and support broader development plans (i.e. the ISP) and state based REZ schemes?*	Generators connecting as part of a REZ scheme receive rebates. Rebates not available for generators wishing to connect within a REZ (but outside the REZ scheme) or generators connecting outside REZs.	Queue applies both inside and outside of REZs.	REZ schemes implemented in accordance with jurisdictional scheme. Locational connection fees apply to generators wishing to connect within a REZ (but outside the REZ scheme) or generators connecting outside REZs.	Connection fees determined in accordance transmission planning framework as adapted to reflect jurisdictional schemes.
9	Implementation *How costly and complex would it be to implement the model?*	Requires enhanced transmission planning framework to decide where rebates are made available, adjustment to settlements systems to allocate rebates, and a process to allocate rebates. Enhancements to the connections/planning framework to assess option to enhance hosting capacity.	Requires establishment of a queue, administratively determined assessment of marginal costs, enhancements to the connections/planning framework to assess changes to queue order.	Requires enhancements to the connections/planning framework to determine the “low harm” threshold and options to reduce connection fees.	Requires enhancements to the transmission planning framework to determine connection fees.

3. Core features of access models in operational timeframes

	Feature	Vanilla CMM	Congestion relief market	Preferential dispatch model
1	Efficient dispatch outcomes *How do we make sure that we dispatch the cheapest available combination of resources to securely meet demand?*	When congestion occurs, market participants are subject to a congestion charge that reflect the marginal cost of congestion at their location.	When congestion occurs, market participants can buy/sell congestion relief.	When congestion occurs, market participants with tied bids are dispatched in order of marginal cost (subject to ramp rates, min. gen requirements) and then queue order.
2	Signals for congestion relief *How do we create incentives for demand side and two way technologies to help to alleviate congestion?*	When congestion occurs, two way and demand side participants are able to access lower prices (equivalent to a negative congestion charge).	Storage, demand response providers, and parties that benefit from disorderly bidding have the opportunity to sell congestion relief to curtailed generators.	*To be discussed – model assumes energy storage has marginal cost of zero.* *Option to incorporate CRM?*
3	Managing inter-regional flows *How do we ensure that we use the transmission system efficiently when inter-regional flows are affected by congestion?*	Congestion relief charges means that it is not necessary for customers to incur additional costs in the event of counter price flows. Instead, the size of the pool of rebates would be adjusted with the effect that generators who are dispatched counter-price receive revenue that is closer to their local price.	*Under consideration.*	*To be discussed*
4	Allocating the value arising from regional pricing *How do we allocate the value arising from the use of regional pricing? [Note: issue overlaps with investment timeframes]*	Depends on rebate allocation metric. Options include: status quo (winner takes all), pro rata access sharing, inferred economic dispatch, or potentially based on a queue.	Initial dispatch run establishes buyers and sellers of congestion relief: retains status quo allocation of value (including winner takes all).	Dispatched generators receive RRP. Dispatch determined in accordance with amended tie breaker rules.
5	Implementation *How costly and complex would it be to implement the model?*	Requires changes to settlements but not dispatch. Impact on dispatch occurs due to impact on participants' incentives.	Further work required to ensure dispatch can solve. Requires changes to dispatch.	Requires changes to dispatch.