



APA submission

Energy Security Board

Capacity Mechanism Project – high
level design paper

July 2022





Ms Anna Collyer
Chair
Energy Security Board

Lodged by email: info@esb.org.au

25 July 2022

RE: Capacity Mechanism – high level design paper

Dear Ms Collyer,

Thank you for the opportunity to comment on the Energy Security Board's (ESB) capacity mechanism high-level design paper (Design Paper). We appreciate the ESB's ongoing engagement in relation to the design of the capacity mechanism.

To secure our energy future and meet the growing demand for electrification, the Australian Energy Market Operator's Integrated System Plan makes clear that we effectively need to rebuild the NEM – nearly doubling the amount of electricity it delivers now, building out a nine-fold increase in grid-scale renewables, trebling firming capacity, including gas-fired generation, and installing over 10,000 kilometres of new transmission lines.

This is a monumental task that will require careful planning and execution, and a system-wide view to balance security, affordability and lower emissions, without which we will lose the mandate for the transition.

As a leading Australian energy infrastructure business, APA is determined to play its part, ensuring our existing national gas infrastructure, and the investments we are making in electricity transmission, renewables and clean fuels, like hydrogen, all contribute to a reliable, affordable and lower emissions future.

APA supports the development of a capacity mechanism to support the ongoing reliability and security of the National Electricity Market. We all know that the task to remove high emissions-emitting coal from the grid is urgent. Coal must be withdrawn with a national plan to replace this generation with firmed energy.

The retirement of coal generation from the grid must be managed responsibly so we don't undermine grid stability and leave us vulnerable to the kinds of shortfalls and shocks we're experiencing today. To ensure that decarbonisation of the energy system occurs at least cost to consumers, the ESB should take a technology neutral approach, that includes gas, to the design of the capacity mechanism.

Australia's existing gas infrastructure is akin to a big battery – capable of dispatching and delivering energy security when it's needed most. As the most recent electricity crisis on Australia's east coast has shown, natural gas is the workhorse of the energy grid with its ability

to be turned on in minutes, and sustained for extended periods, delivering energy security when it's needed most.

As the energy transition gathers pace, gas generation will continue to be the perfect complement to variable renewable energy for when the wind doesn't blow and the sun doesn't shine, which will help achieve the orderly and responsible transition that we all need to avoid supply and price shocks.

If you wish to discuss our submission in further detail, please contact John Skinner at john.skinner2@apa.com.au

Regards,

A handwritten signature in black ink, appearing to read 'P. Bolding', written in a cursive style.

Peter Bolding
General Manager
Economic Regulation & Policy

1 Executive Summary

Key points

- APA supports the development of a capacity mechanism to help maintain the ongoing reliability and security of the National Electricity Market (NEM).
- To ensure that decarbonisation of the energy system occurs at least cost to consumers, the ESB should take a technology neutral approach to the design of the capacity mechanism.
- The capacity mechanism needs to clearly outline the obligations on capacity providers, including for events such as planned and unplanned outages. We propose that the capacity mechanism includes a clear outage planning process which allows AEMO to pre-approve planned outages.
- Within each time period, there should be a strong link between (a) the degree the power system is under stress and (b) the incentive to make capacity available.

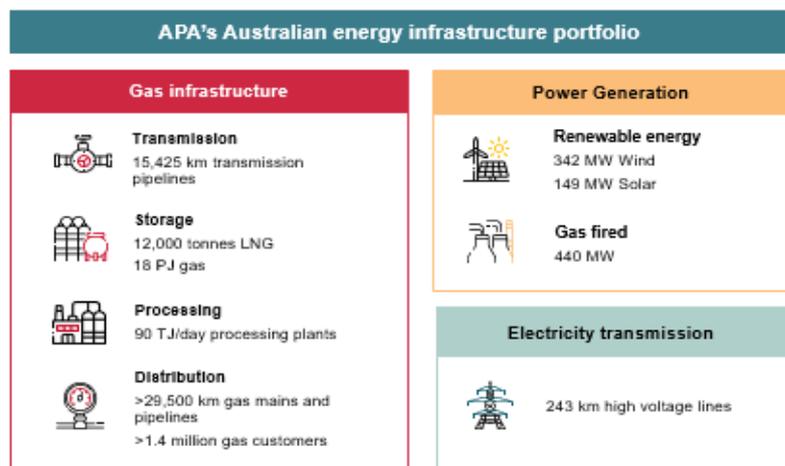
APA is a leading Australian Securities Exchange (ASX) listed energy infrastructure business. Consistent with our purpose to strengthen communities through responsible energy, our diverse portfolio of energy infrastructure delivers energy to customers in every state and territory on mainland Australia.

Our 15,000 kilometres of natural gas pipelines connect sources of supply and markets across mainland Australia. We operate and maintain networks connecting 1.4 million Australian homes and businesses to the benefits of natural gas. And we own or have interests in gas storage facilities, gas-fired power stations.

Figure 1

Our investments include over \$750 million in renewable generation, making APA one of the largest renewables investors in Australia. Our high voltage electricity transmission connects Victoria with South Australia and New South Wales with Queensland.

APA is supporting the transition to a lower carbon future. Our ambition is to achieve net zero operations emissions by 2050. Through our Pathfinder Program, we are investing in hydrogen projects and other technologies such as batteries and microgrids, which can support a lower carbon future.



Gas infrastructure has an essential role to play in helping Australia meet its net zero ambitions targets. As the penetration of variable renewable energy sources, such as wind and solar, increase, and aging coal power stations retire, gas powered generation (GPG) will play a critical role in meeting electricity demand and maintaining the security of the system. In effect, GPG will help ‘unlock’ many more multiples of VRE in the NEM.

APA supports the development of a capacity mechanism as part of NEM arrangements. The Design Paper correctly highlights the importance of a mechanism for supporting economically marginal capacity providers, including GPG. The ESB recognises that this is a more efficient and cost effective option for consumers than a requirement for investment in new capacity.

Technological neutrality is one of the assessment criteria outlined by the ESB which will guide the design of the capacity mechanism. APA supports technology neutrality, as this approach will ensure that the decarbonisation of the economy occurs at least cost to consumers.

However, we also agree with the ESB that because each generation type has different operating characteristic and constraints, that this variability needs to be recognised in the design of the capacity mechanism’s de-rating approach.

Our submission provides views on several other issues raised in the Design Paper, including:

- **Cost recovery** - APA supports the ESB’s preference to recover the costs of procuring capacity through market customers (retailers and other large users) through the NEM settlement process.
- **Capacity procurement** – APA considers that AEMO should determine how much capacity is required in the market, based on a transparent methodology set out in the capacity mechanism design. This determination will also establish how much each market participant is required to procure. Based on AEMO’s capacity requirements determination, market customers should then be able to decide how their capacity obligations are discharged.

Our submission to the Consultation Paper is structured as follows:

- PART A contains the key issues we wish to raise in response to the Design Paper
- PART B contains answers to the questions for stakeholders

2 PART A – Key issues

2.1 Gas is essential for energy security during the energy market transition

The NEM is going through a period of fundamental change, with large volumes of VRE displacing aging thermal generation, mostly coal power, at great speed. This transition is not without its challenges.

Recent experience has demonstrated the critical role that gas plays in supporting renewables and providing a critical backup when large renewable generation such as wind and solar is not available. For this reason, it is essential that the capacity mechanism is technology agnostic and allows all forms of energy generation to participate.

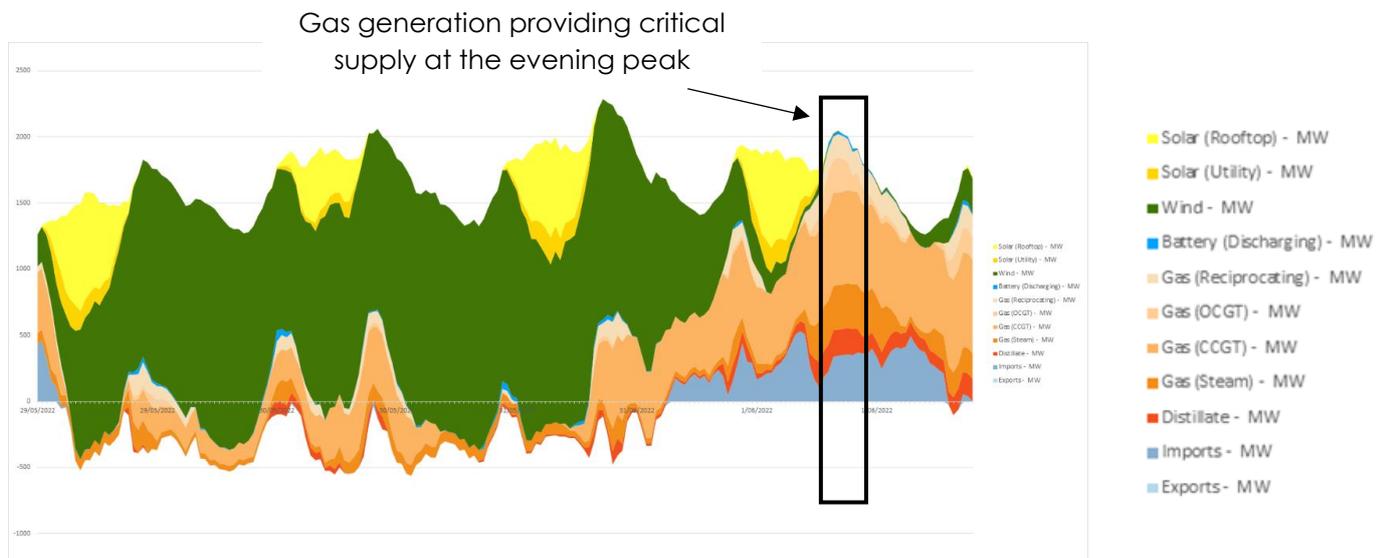
The gas network is a flexible, affordable and safe store of energy, making it ideal to help support energy supply during extreme weather or periods of reduced supply. The ability to locate GPG close to major demand centres also reduces exposure to transmission capacity constraints often experienced by the overconcentration of renewable generation in common areas of the grid. This advantage may become critical if there are delays in building the necessary transmission investment to support VRE.

2.1.1 Gas’s role in complementing variable renewable generation

As recent experience in South Australia (SA) has shown, periods of low wind and solar availability require significant volumes of dispatchable resources to be available to support the reliability and security of the system. Similar issues are likely to be experienced in other states as coal power stations retire.

Despite the introduction of synchronous condensers in SA, GPG remains critical in keeping the lights on during periods of low wind and solar generation. For example, on 1 June 2022, GPG provided critical supply at the evening peak (see Figure 2).

Figure 2: Case Study 29 May to 1 June 2022 in South Australia



Source: OpenNEM

The critical role that gas will continue to play into the future was also recognised by the Grattan Institute in its report *Go for net zero: A practical plan for reliable, affordable low-emissions electricity*.¹

Grattan correctly identified that the economics of GPG make it ideal for providing backstop capacity in a system powered mostly by solar and wind. Grattan found that an energy system supported by GPG will result in lower costs for consumers than a system 100% powered by renewables. The main reasons for this include:

- in contrast to coal, gas turbines can ramp up and down quickly to balance fluctuations in demand;
- it is easier and cheaper to store gas and liquid fuels than electricity, which make them ideal for energy storage in case of a particularly challenging winter or summer; and
- Australia has substantial infrastructure for moving and storing gas.

The European Commission has also concluded that gas will play a significant role in its net zero scenario, as it will 'increasingly be a facilitator for the spread of renewable electricity and stable supply'.²

2.1.2 **Gas's role in supporting the NEM during unexpected events**

Events in Queensland and Victoria in mid-2021 also demonstrated the flexibility and security offered by GPG:

- On 25 May 2021 a failure of one of the generation units at Callide Power Station in Queensland caused 477,000 customers to lose power.
- In mid-June 2021, Yallourn Power Station in Victoria reduced electricity generation to approximately 20% capacity due to the threat of floodwater from the Morwell River. This was the second time Yallourn experienced a significant flooding event, with the Power Station shutting in 2012 when floodwaters entered the adjoining mine.

Following both these events, GPG stepped up to help provide crucial electricity generation in both Queensland and Victoria. GPG doubled its output while not increasing overall emissions. The ability of gas turbines to quickly ramp up and provide long term dispatchable generation shows they will be a critical part of the energy system for many years to come.

2.2 **Not all capacities are equal**

Technological neutrality is one of the assessment criteria that will guide the ESB's design of the capacity mechanism. APA supports technology neutrality, as this approach will ensure that the decarbonisation of the economy occurs at least cost to consumers.

However, we also agree with the ESB that because each generation type has different operating characteristic and constraints, that this variability needs to be recognised in the design of the capacity mechanism's de-rating approach.

¹ Grattan Institute, *Go for net zero*, April 2021, p30

² European Commission, https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_712

For example, thermal plants are derated by ambient temperature while the capacity of wind and solar generation are constrained by the availability of wind and sun respectively. The capacity mechanism's de-rating approach will need to take into account the significant variability in the output of different generation technologies. As the first six months of 2022 have demonstrated, a significant reduction in the expected output of some generation technologies can have a material impact on wholesale electricity prices, as well as energy security.

2.3 Performance obligations

In section 7.1 of the Design Paper, the ESB sets out three options for imposing performance obligations on capacity providers. The ESB proposes to take option 3 "for consultation and stakeholder feedback." Option 3 is defined as "performance obligations based on a capacity provider's availability throughout the year plus additional obligations/incentives during actual lack of reserve events, which can be triggered at any time."

APA agrees with the choice of Option 3 in principle. A capacity provider should make its capacity (that it receives capacity payment for) available to the respective NEM region with limited exceptions, such as a planned outage as approved by AEMO.

The degree of availability of capacity is commensurate with the degree of power system reliability. In other words, the more capacity is delivered by capacity facilities (and/or more often such capacity is delivered), the more reliable the power system is expected to be. As the end users are paying for the capacity to be made available, hence paying for the associated power system reliability, it is naturally equitable to expect such capacity to be available at all times, subject to planned outages.

2.4 Capacity cost allocation

Section 8 of the Design Paper discusses the options for the recovery of capacity cost. APA supports the ESB's preference to recover the costs of procuring capacity through market customers (retailers and other large users) through the NEM settlement process. APA also agrees that "this approach is simpler, well understood in the NEM and will allow retailers to manage their costs by actively managing their customers' demand."

2.5 Market customers participating in capacity procurement

The options for capacity procurement are discussed in section 6 of the Design Paper. In section 6.5.1, the ESB has expressed a preference for a hybrid model where market customers have a role in capacity procurement.³ This hybrid model also involves a capacity auction process. AEMO and market customers will be able to participate in such auctions.

While the APA supports market customers having a role in capacity procurement, APA considers that AEMO should determine how much capacity is required in the market, based

³ Market customers are (a) retailers and (b) large users of electricity who buy directly from the NEM. Section 6.5.1 of the Design Paper discusses retailers' participation in the capacity procurement mechanism (and did not mention the large users). APA assume the ESB intends to include the large users as participants in this procurement mechanism.

on a transparent methodology set out in the capacity mechanism design. This determination will also establish how much each market participant is required to procure.

Based on AEMO's capacity requirements determination, market customers should then be able to decide how their capacity obligations should be discharged, which could occur by procuring capacity: (a) from the auction; (b) From AEMO who has procured capacity from the auction and then on-sell the capacity to the market customer; and (c) directly from a capacity provider through bilateral trade. Giving market customers more choices for discharging their capacity procurement obligations will help promote competition and efficiency.

2.6 Within a time period, there should be a strong link between (a) the degree the power system is under stress and (b) the incentive to make the capacity available

In section 7.1 of the Design Paper, the ESB asks what capacity providers must do to receive payment (i.e. the capacity payment arrangement). Section 7.3.2 of the Design Paper sets out the proposed capacity payment arrangement for option 3 in further details.⁵

There should be a strong link between (a) the incentive of the capacity providers to make the relevant capacity available and (b) the criticality of making that capacity available. In other words, at a time, the more the system is under stress (i.e., lack of availability of reserve capacity), the more the capacity provider should be incentivised to make its capacity available.

The Design Paper seeks to achieve this through the proposed capacity payment arrangement. In essence, the Design Paper proposes that the capacity payment be made to capacity providers in two parts:

- (a) for availability throughout the year and
- (b) for availability during the periods of system stress.

These arrangements would reward capacity providers, through additional capacity payment, for making their capacity available during the periods of high system stress. This would align the incentives of the capacity providers with the capacity need of the power system.

The Dynamic Refund Pricing Model (DRPM) as utilised in the Wholesale Electricity Market (WEM) of Western Australia, offers a model for rewarding capacity providers. Given the DRPM is a known mechanism, the ESB should consider whether aspects of this model could be utilised in the NEM. If the ESB considers that aspects of the WEM model are not appropriate, it should preferably explain why that is the case.

2.7 There should be a clear process for pre-approving planned outages

The capacity mechanism should include an outage planning process that allows AEMO to pre-approve an outage (planned outage) for a period of time with respect to part, or all, of the capacity of a capacity facility. This process, if well designed, can be expected to produce an optimal outage schedule that minimises the probability of supply shortfall in the NEM.

⁵ That is, the option the ESB has selected for consultation and stakeholder feedback.

3 PART B – Responses to questions for stakeholders

Chapter 5: Forecasting demand and the building blocks for a mechanism

Question	APA response
Q1 What measures could be put in place to improve AEMO's forecasting process and to access the best information from retailers and large customers on their likely demand?	<ul style="list-style-type: none">• No comment.
Q2 Do you agree that the capacity mechanism should provide for multiple zones being the existing NEM regions?	<ul style="list-style-type: none">• Yes. Aligning the capacity mechanism zone definition with the energy market will enable easier coordination between these two mechanisms.
Q3 Is there sufficient evidence to say that the at-risk periods can be defined on a timebased definition?	<ul style="list-style-type: none">• No comment.
Q4 If there is a risk of the emergence of more than one at-risk period in the NEM how should that be addressed?	<ul style="list-style-type: none">• No comment.
Q5 The de-rating factors produced by different at-risk period definitions and modelling methodologies can show large ranges particularly for non-traditional technologies. How should this and potential year to year variability in de-rating factors be addressed?	<ul style="list-style-type: none">• No comment

Q6 What approaches should be used to de-rate different technologies? Should different approaches apply to different technologies?

- As discussed in section 2.2, not all technologies are equal.
- We agree with the ESB that because each generation type has different operating characteristic and constraints, that this variability needs to be recognised in the design of the capacity mechanism's de-rating approach.

Q7 What is the right balance between transparency/ simplicity and accuracy?

- No comment.

Q8 Should de-rating factors be determined at a technology class/region level or at a station level?

- Derating factors should be determined at a facility class level. This would strike a balance between simplicity and accuracy. To determine a derating factor for each station could impose a regulatory burden on market participants. It is necessary to differentiate derating factors by technology type because each technology type has different (a) drivers for derating and (b) operating characteristics and constraints.

Q9 Do you agree with the approach to setting the forecast capacity requirement and the target capacity in a region?

- No comments.

Q10 How should the target capacity be determined where there are gaps in more than one region?

- No comments.

Chapter 6: Procuring capacity and auction design

Question	• APA response
Q11 Should retailers have a role in a centralised capacity mechanism?	<ul style="list-style-type: none"> Market customers (retailers and large users who buy directly from the NEM) should have a role. See section 2.5 of this submission.
Q12 If you support retailer involvement in procurement, what are your views on how this could operate?	<ul style="list-style-type: none"> See section 2.5 of this submission.
Q13 Do you agree with holding two auctions for each delivery year and is this timing appropriate? If no, what auction frequency and timing is appropriate and why?	<ul style="list-style-type: none"> No comments.
Q14 How should the timing of the auctions align with the notice of closure obligation?	<ul style="list-style-type: none"> No comments.
Q15 What are your views on how existing and new capacity should be treated in the auction process?	<ul style="list-style-type: none"> Unless there is a compelling reason to do otherwise, existing and new capacity should be treated equally under the capacity mechanism. Otherwise, it could lead to unnecessary complexity. For example, if the ESB decides to reduce the Market Price Cap (MPC) for the energy market to account for the capacity mechanism revenue, and existing capacities are treated differently to new, will this create an uneven playing field under the MPC?



<p>Q16 Are there other considerations the ESB should take into account for the detailed design?</p>	<ul style="list-style-type: none">• No comments.
<p>Q17 Do stakeholders have a view on the optimal duration of certificates or price certainty for new capacity?</p>	<ul style="list-style-type: none">• No comments.
<p>Q18 Do stakeholders have a preference as to whether the investment support scheme provides guarantees of price only, or of both price and quantity?</p>	<ul style="list-style-type: none">• No comments.
<p>Q19 Internationally, capacity mechanisms rely on some multiple of the net-cost of new entry (net-CONE) assessment to determine the capacity mechanism market price cap. Is this appropriate or should an alternative approach be used?</p>	<ul style="list-style-type: none">• No comments.
<p>Q20 How should the price settings interact with the energy market price? Over time, when settings are regularly reviewed, should the price settings in the capacity auction and the energy market be jointly determined?</p>	<ul style="list-style-type: none">• See our response to Q37 of Chapter 7.• If the ESB needs to make adjustment to the current energy-only market to account for the capacity mechanism, the ESB should look into the implications of such adjustments on the contract market (i.e., energy derivative products market – e.g., the swaps, caps, long term hedges and others – exchange traded and bilaterally traded). The existing hedging products would have been designed and

	priced based on the current energy-only market settings (including the current MPC).
Q21 Are there other considerations the ESB should take into account when determining demand curves in the detailed design?	<ul style="list-style-type: none">• No comments.
Q22 While the RRO requires mandatory participation for the largest three participants in a region, the ESB considers a methodology for determining market power should be applied to account for changing market concentration over time. Are there specific market concentration thresholds of concern?	<ul style="list-style-type: none">• No comments.
Q23 Should market power mitigation measures be applied to capacity providers with large market shares in supply-side regardless of their market share in retail?	<ul style="list-style-type: none">• No comments.
Q24 Do stakeholders support the proposal to integrate capacity mechanism settlement with the existing NEM settlement process? If not, what alternative process would better meet the design objectives?	<ul style="list-style-type: none">• Yes. This arrangement would be simple and well understood.



Chapter 7: What are the obligations on capacity providers?

Question	• APA response
Q1 Do you have preliminary views on compliance obligations for capacity providers?	<ul style="list-style-type: none"> • Please see section 2.3.
Q2 Do you have views on compliance obligations for new entrant capacity in advance of the delivery year?	<ul style="list-style-type: none"> • No comments.
Q3 Do you support the ESB's proposed performance model for consultation? If no, what other proposed model would be better and why?	<ul style="list-style-type: none"> • Yes, we support option 3 in principle. Please see comments in sections 2.3.
Q25 Are there any issues with using LOR2 and LOR3 as the trigger for capacity payments? If yes, please explain the issues and any alternative triggers.	<ul style="list-style-type: none"> • No comments.
Q26 How would an appropriate methodology year-round availability be determined?	<ul style="list-style-type: none"> • No comments.
Q27 Do you support the ESB considering capacity payments based on availability throughout the year and during periods of system stress?	<ul style="list-style-type: none"> • See comments in section 2.6.
Q28 If you support payments based on two factors, what is the preferred distribution of the first and	<ul style="list-style-type: none"> • No comments.

second payment? Should more or less weight be given to responding to events?	
Q29 To support revenue smoothing, should the ESB consider grouping events within the delivery year? If yes, what frequency (such as quarterly or monthly) is appropriate?	<ul style="list-style-type: none">• No comments.
Q30 Should an upper threshold of performance events in a delivery year be considered? If yes, what is an appropriate threshold?	<ul style="list-style-type: none">• No comments.
Q31 Are there any other interactions with the existing energy only market that the ESB should consider when designing the capacity mechanism performance obligation?	<ul style="list-style-type: none">• The PASA process and network outage schedule process may need to be reviewed. As outlined in Question 20, the MPC may also need to be reviewed.
Q32 Are there any other compliance issues the ESB should be mindful of in detailed design?	<ul style="list-style-type: none">• No comments.
Q33 Are there any other implications the ESB should consider in detailed design?	<ul style="list-style-type: none">• No comments.
Q34 What is the appropriate combination of performance obligation and capacity derating methodologies?	<ul style="list-style-type: none">• No comments.



Q35 Should de-rating be based on pre-defined time periods or a forecast of when the anticipated trigger periods are expected to occur?

- No comments.

Q36 Given VRE is likely to be particularly affected by any mismatch in the forecast and actual conditions during performance events, should special consideration be given to VRE's compliance with the performance obligation?

- No comments.

Q37 Do you think the MPC should be reduced if a capacity mechanism is introduced, and if so, by how much? What key issues should the ESB take into account when considering this issue?

- In the current energy-only market design in the NEM, the MPC is designed to give sufficient price volatility to enable generators to recover their capital costs.
- There is a trade-off relationship between the capacity revenue and MPC. The lower the capacity revenue is, the higher the MPC needs to be to enable the capacity to recover its capital cost that it does not recover through the capacity mechanism.

Chapter 8: How will costs be allocated?

Question	APA response
Q38 Do you agree that costs should be passed on via retailers, rather than NSPs?	<ul style="list-style-type: none">• The cost should be passed on via retailers (and be imposed on large users who buy directly from the NEM). See discussion in section 2.8.
Q39 What do you consider to be the most appropriate mechanism to allocate costs to retailers?	<ul style="list-style-type: none">• No comments.

Chapter 9: How is transmission capacity reflected in the capacity mechanism design?

Question	APA response
Q40 Do you think that Option 1 or Option 2 better meets the assessment criteria?	<ul style="list-style-type: none"> No comments.
Q41 Are there any other factors that the ESB should consider when assessing the relative merits of the options?	<ul style="list-style-type: none"> No comments.
Q42 Are there other ways to ensure that procurement of interstate capacity resources does not exceed inter-regional transmission limits, in addition to the two approaches outlined above?	<ul style="list-style-type: none"> No comments.
Q43 Do you think that where a market interconnector exists between two regions, it should be the entity that is eligible to submit inter-regional capacity bids?	<ul style="list-style-type: none"> No comments.
Q44 Do you think that proposed new market interconnectors should be able to participate in the capacity mechanism?	<ul style="list-style-type: none"> Yes. This is because market interconnectors rely in energy price difference between two regions for its revenue. With a capacity mechanism, and if the MPC is reduced as a result of this mechanism, the price differences between regions are expected to be lower. This is expected to lower the revenue of the market interconnectors. This may mean market interconnectors will not be able to recover its capital cost under the lowered MPC. A capacity revenue would



be required by the market interconnectors to meet this revenue shortfall. To receive the capacity revenue, market interconnectors need to participate in the capacity mechanism.



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