25th July 2022

Energy Security Board
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Finncorn

Submission to the Energy Security Board in response to the Capacity Mechanism High-level Design Paper

Please find attached a public submission for the consideration of the ESB.

Yours sincerely,

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Capacity Mechanism

Finncorn Consulting's response to the ESB's High-level Design Paper

Released as a public submission

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1. Introduction

Finncorn has been engaged by Energy Consumers Australia ('ECA') to review the ESB's Capacity Mechanism High-level Design Paper ('ESB Paper') and provide feedback on how a capacity mechanism may best serve the long-term interests of consumers. We understand that ECA will reference this submission with their own response to the ESB Paper.

We are not engaging in debate on whether or not a capacity mechanism is needed or desirable (any more!)

Instead we are dealing with the question of how – if it is to be put in place – a capacity mechanism design may be optimally designed from a consumer perspective.

All forms of capacity investment face challenges – be they batteries, pumped hydro, thermal plant or consumers' demand response ('DR') and energy efficiency ('EE'). The primary objective of the capacity mechanism is to lower the barriers to efficient investment across this diverse range of potential providers.

1.1 Take care not to assume Energy Ministers represent consumers

We think the consumer voice in the design of the mechanism is particularly important when the ESB and Energy Ministers appear to presume politicians' interests are interchangeable with consumers, as expressed in the assessment criteria (ESB Paper p4, our emphasis):

> *"… a mechanism should achieve the target level of reliability that consumers **and governments** value."*

There is no doubt that governments are a stakeholder, but they are not identical to consumers.

In fact, consumers are presumed to have a sophisticated understanding of the trade-off between reliability and cost, as expressed in the value of customer reliability ('VCR') used in setting the Reliability Standard.

By contrast, politicians appear to exhibit an extremely strong aversion to reliability threats – quite understandable given politicians face the full force of the ire of citizens if load shedding occurs, but do not face the costs of gold-plating directly – as consumers do.

Energy Ministers have already expressed this aversion, and imposed costs on consumers beyond their preferences, via the Interim Reliability Standard.

The Reliability Panel process and the setting of the (non-interim) standard is the appropriate venue for Energy Ministers to make the case that they have a better insight into customer trade-offs of reliability and costs than the current process has revealed, or alternatively a mandate to over-ride that – not the capacity mechanism design, which can support whatever Reliability Standard is agreed.

1.2 Carbon intensity is not in the NEO – but neither is price stability

The ESB Paper makes clear that in many respects, the root of the problem with capacity investment is out-of-market interventions by governments.

Many of the recent interventions have been on two related fronts:

- Imposing **carbon reduction** policy onto the sector (the LRET, ARENA / CEFC support, state targets) – which is now commonly if uncomfortably presumed to be a 'shadow objective' in the NEO.
- Imposing, arguably as a direct result of the above, **investment in firm capacity** (Snowy 2.0, Hunter gas peaker, various large-scale batteries).

The second of these is really – in our view – about another 'shadow objective' presumed to be part of the National Electricity Objectives ('NEO'): price stability. The ESB Paper asserts "*customers value stability in their energy bills*" and while this is clearly true, the degree to which customers trade off stability versus average cost is far from clear.

The ESB Paper rightly calls for clarity from Energy Ministers in relation to the carbon reduction objective – to allow it to be properly integrated into a durable market design.

Equally – if we are designing a mechanism to deliver 'stability' – this should be formalised and customers must be consulted about where they believe their long-term interests lie in relation to the trade-off between price stability and costs, in exactly the same way they are consulted in the reliability trade-off.

1.3 Best design principles

There are several principles we believe should be clearly evident in the ESB's final design proposal to Energy Ministers:

1. **Total wholesale costs paid by consumers should demonstrably decrease**
2. **Capacity Mechanism should not overcompensate sunk costs of existing assets**
3. **Capacity providers should face the consequences of unreliability**
4. **Consumers should have a clear opportunity to fund their own reliability via DR and EE**
5. **Energy efficiency gains and consumer-led DR are likely to be cheaper than marginal new capacity**

Each of these lead to recommendations for the final design of the capacity mechanism.

1.3.1 Total wholesale costs paid by consumers should demonstrably decrease

There is a status-quo counterfactual of wholesale price outcomes under the current Market Price Cap, ('MPC') in the energy-only market, with current reliability settings including the Retailer Reliability Obligation ('RRO'), under a transition consistent with the ISP's Step-Change scenario, and consistent with modelling under the Electricity Statement of Opportunities ('ESOO').

Such a forecast should include expectations of unserved energy ('USE') at the Reliability Standard, with the system sized to deliver that USE outcome, driven by either market design (the MPC and the current RRO) or governmental interventions.

Any changes to the Reliability Standard are independent from the capacity mechanism, and so for modelling purposes, we should assume both the current energy-only market and the reformed market will deliver the Reliability Standard – but at different wholesale cost.

It is implicit in pursuing this reform that a capacity mechanism should be more efficient, in tilting relatively stable payments towards capacity providers, offsetting some of the more volatile payments received for energy. Notably, from a consumer perspective, **this is a substantial transfer of risk towards consumers**, in favour of generators.

The benefits touted include:

1. More stable revenues for capacity providers, compared with energy-only volatility; and
2. Less uncertainty in relation to governmental intervention and crowding out, as the mechanism is responding directly to Ministers' requirements in order for them to resist the urge to intervene.

Both of these should lead directly to lower cost of capital for generation, and thus lower required revenues in aggregate. These lower wholesale costs are the reason why consumers may accept the transfer of risk.

As a result, **consumers expect that the capacity mechanism final design will be supported by robust modelling which demonstrates materially lower aggregate wholesale costs.**

One lever to ensure this outcome is via a materially lower MPC.

1.3.1.1 Ex-post review and adjustment is essential – Mechanism Monitor

If Energy Ministers choose to adopt this reform, consumers should be provided with a commitment from Energy Ministers that there will in fact be an aggregate cost outcome consistent with this expectation – and if necessary, the design of the market will be adjusted in future to achieve this.

This may be delivered via a biennial review of the capacity mechanism against its promises – with a focus on aggregate wholesale costs – empowered to adjust settings and design as necessary to ensure consumers are receiving the benefits promised by the reform.

We understand ECA will propose a 'Mechanism Monitor' concept, consistent with how this broad issue is managed in consumers' interests in international jurisdictions.

1.3.2 Capacity Mechanism should not overcompensate sunk costs of existing assets

The ESB's preference to include all existing assets in the capacity mechanism is controversial, and on the face of it, appears to run counter to the 6th Energy Ministers' Principle:

> *"safeguard energy consumers. In particular:* ***... avoid duplication of costs*** *to secure reliability"*

Existing assets represent sunk costs – investments that have been made under the current energy-only market design, and in many cases with explicit, material out-of-market support from state and federal governments, ARENA and CEFC in order to overcome any deficiencies in the investment case without support.

Providing these assets with new, more stable revenues than expected represents a windfall gain – and from a consumer perspective, that is a "duplication of costs" which greatly increases the overall quantum of capacity payments consumers must fund.

In section 10.4 of the ESB Paper, **the issue of 'technology neutrality' is conflated with this question of whether to pay existing sunk investments in capacity – these are not the same thing at all.**

Technology neutrality is a sensible design objective which appears to be handled well in general. It should not be used as a slogan for providing windfall benefits to incumbent capacity.

The implicit presumption in the ESB Paper to justify this seem to be that – were it not for receipt of capacity payments – existing assets are on the verge of withdrawal. In many cases this is clearly untrue – particularly recent investments in battery and gas capacity which are well-suited to the future market.

In the case of a handful of very large thermal coal assets, the ESB Paper makes clear – to paraphrase – nothing on earth can save them, and that is not the objective of the reform in any case.

We suggest three broad approaches below to resolve this.

1.3.2.1 Grandfather existing assets via the MPC

One compelling argument in favour of <u>including</u> existing assets partway through their economic lives is the question of equity: changing the rules (such as imposing a lower MPC and consequently lower expected energy-only revenues) but not providing access to the compensating capacity payments would be manifestly unfair to existing asset owners.

A solution may be to preserve the status quo - grandfathering these assets as follows:

- Existing assets do not receive capacity payments.
- Existing assets are realistically assessed for their contribution to reliability, consistently with new assets, and the capacity gap to be procured is reduced by this existing tranche.
- The MPC remains unchanged for these assets (including reviews in future).
- New capacity (receiving capacity payments) is limited to a lower MPC in the energy market settlement process.

We are acutely aware that there is a potential sting in the tail for consumers here, particularly in the case of inflexible thermal assets (coal, and potentially combined-cycle gas turbines) which struggle to respond (operationally, and thus economically) to the variability of the VRE-driven system.

Without more stable capacity mechanism revenues to fund adequate maintenance expenditure, there is a risk of poor reliability outcomes prior to exit (and associated higher wholesale energy costs associated with unplanned outages).

For this handful of large units at death's door, we agree that an overlay to ensure acceptable reliability performance would be needed, but suggest this should best be managed outside the capacity market.

There may also be gaming risks with two MPCs in play – but our suggested approach to the capacity payment structure (in the following **Section** 1.3.3) should ensure 'new' assets remain very strongly incentivised to bid themselves available and be dispatched at times where prices for 'old' assets may exceed the new, lower MPC – as they would otherwise risk loss of their capacity payment.

1.3.2.2 *Pro-rate existing assets based on reasonably simple metrics*

An alternative approach[1] to resolve the problem of overcompensating existing assets may be to allow all assets to bid into the capacity mechanism auction and maintain the single lower MPC, but to apply a proportional scale-back in payment to existing assets which win contracts.

This may be based on metrics (several of which may apply) such as:

- **Remaining life to closure** (the earlier of current announced closure date or a reasonable end-of-technical life)
- **Supported elsewhere:** Proportion of capital costs and/or minimum necessary revenues supported out-of-market (e.g. by grants, CFDs or options such as the NSW LTESA structure)
- **Already depreciated:** A fixed scale-back if an asset has already earned a notional (say) 10% return on original capital based on contracted, wholesale and ancillary services revenues to date.

1.3.2.3 *Manage large thermal exits discretely… as is already underway*

A version of this could choose to exclude a specific class of existing assets only, such as large thermal plant. This may be a better, more consistent design that might allow for removing some of the more uncertain Ministers' Principles: 13 and 14 (the opt-in / opt-out) and 11.a (the prospect of different state-based rules about what types of technology may receive payments).

A key challenge in this case is ensuring adequate reliability from such assets by other means.

Given the precedents which already exist such as Yallourn's obscure deal with Victoria (and which therefore further clouds the issue of adding support to existing incentives not to close), a more pragmatic approach for this small but significant group of thermal units may be a consistent approach to **Orderly Exit Management Contracts ('OEMCs')**. This includes principles of consistency, competitiveness and transparency in bilateral arrangements of this type.

The Post-2025 recommendation for development of parameters for OEMCs directly address Ministers' Principle 8 and 9 (*provide greater certainty around closure dates of exiting generation,* and *mitigate reliability risks presented by unexpected closures of existing capacity*). We support this recommendation.

1.3.3 Capacity providers should face the consequences of unreliability

Under the capacity mechanism, consumers are asked to accept more risk – in the form of fixed payments for capacity – and in doing so, relieve generators of the risk of volatile energy-only market pricing.

It is reasonable for consumers to expect that if they are prevailed upon to pay generators this type of insurance premium for reliability, then they will be materially insulated against the consequences if generators then fail to deliver that reliability… at a bare minimum, their insurance premium should be fully refunded!

As a result, the consequence of failure to dispatch to the obligated level under LOR2 & LOR3 conditions ('Reliability Events') should not be limited to simply missing out on a 'bonus' tranche of the capacity payment. The incentive to actually deliver reliability to consumers as promised should be much stronger.

Instead, capacity payments and consequences should be structured as follows:

- **Scale payment to ex-post annual availability:** Each unit's target aggregate availability over the year in MTPASA and STPASA should be stipulated in the contract to receive payment, and should act as a scaling factor[2] for the notional annual capacity payment:
  - The commitment may be availability in (e.g.) 90% of all trading intervals (allowing for planned / unplanned outages, and set by each unit in its auction offer).
  - If actual availability is 94.5%, available capacity payment scaled up to 105% of the notional.
  - If actual availability is 81%, available capacity payment scaled back to 90% of the notional.

[1] With thanks to Neil Lessem of Econalytics (https://econalytics.com.au) who reviewed this paper in draft and suggested (among other improvements) this type of alternative based on experience in other markets.

[2] Which need not necessarily be linear as illustrated in the example.

- **Pay based on percentage bid availability & dispatch into Reliability Events:** Actual bid availability and dispatch performance during Reliability Events should determine to what extent the scaled capacity payment is received:
  - If bid available in all trading intervals for all Reliability Events, and successfully dispatched when required, receive 100% of the scaled capacity payment.
  - If there are no Reliability Events in the year, receive 100% of the scaled capacity payment subject to acceptable performance in a 'test event' to provide evidence of ability to deliver reliability.
  - If only bid available in a lower proportion of trading intervals for Reliability Events, and/or if failed to meet dispatch targets under such conditions when called, only receive that proportion[3] of the capacity payment.
  - For assets with limited duration, this should be adjusted – for example, a 2-hour battery may be therefore expected to bid available and potentially be dispatched for two hours per day (or whatever they are prepared to offer in the auction process) when Reliability Events occur.

1.3.3.1 No play, no pay (and a multi-year framework with flexibility to exit)

As a principle, generators should face significant consequences if they are unable to meet their obligations – and at a minimum, that should be exposure to a complete scale-back of capacity payments to $NIL for the year in the case of lengthy unavailability.

Consumers are not in a position to robustly arrange fuel supply contracts and logistics, or to schedule unit maintenance at time of low reliability risks, or indeed to ensure adequate maintenance occurs at all.

Consistent with this, in the extreme case where an asset is not available at all during Reliability Events in a year (e.g. due to a lengthy unplanned outage as we have observed recently), then that asset should not receive any capacity payment. The asset owner has not met its implicit commitment to customers to manage its assets adequately and should not be paid for capacity that did not, ex-post, exist when it was needed most.

We note that in some cases, this foregone capacity payment value is likely to be less than the harm suffered by consumers due to higher wholesale market prices or, in the case of USE, the VCR value applied to the lost load.

As a result, if an asset finds itself in this culpable position a trailing penalty should apply:

- **Make up harm from future capacity payments:** The asset's contracted capacity payments should be reduced for all of its future-year capacity contracts, to the extent of an estimate of the economic harm caused to consumers via higher wholesale prices and/or VCR due to the failure.
- **Sin-bin for capacity auction participation:** The asset should not be permitted to participate in future auctions until it has undergone an external assessment of technical reliability which supports any future participation.

We consider this multi-year consequence would represent a strong incentive to make the multi-year investments needed to maintain reliability consistent with the intent of the mechanism. It would also ensure there is a clear signal to exit if an asset is unable to operate reliability, as it promised.

1.3.3.2 Role of a Mechanism Monitor is relevant to compliance

More generally, there should be an obligation on all recipients of capacity payments to apply good operating and maintenance practices to ensure the payments are directed towards operational reliability.

In this regard, the role of the independent 'mechanism monitor' (**Section** 1.3.1.1) with the power to claw back capacity payments in the case where this has not occurred is important.

[3] Again, this need not be linear. For example, small percentage unavailability may involve a lower scale back, but larger more widespread failures to contribute to reliability may involve sharper scale back.

1.3.4 Consumers should have a clear opportunity to fund their own reliability

Consumer energy efficiency, demand response and the broader value of orchestrating distributed energy resources to respond to system reliability (and other) requirements represents an opportunity for consumers to capture some of the capacity mechanism revenues.

This should be a meaningful part of the overall arguments that the reform will lead to materially lower net wholesale energy costs for consumers.[4]

All forms of capacity investment face challenges – be they batteries, pumped hydro, thermal plant or consumers' EE and DR. The primary objective of the capacity mechanism is to lower the barriers to efficient investment across this diverse range of potential providers.

The consumer-led capacity opportunity – especially when extended to the potential for controlled storage in homes or EVs – is likely to be highly material relative to supply-side capacity requirements in the medium to long term.

As a result, the design of the capacity mechanism must not simply focus on accommodating generation and wholesale storage investment needs, but also recognise the interest of consumers in having clear access to their share of the capacity mechanism revenue pool.

Any least-cost system of capacity should be expected to include material DR and EE – but the ESB Paper is largely silent on the question at this stage. Consumer support for the capacity mechanism as a whole is likely to be related to the opportunities it presents to DR and EE in the detailed design – as a core feature, not an afterthought.

There are two major broad opportunities to harness DR and EE participation in the capacity mechanism:

1. **Direct participation** in capacity auctions, akin to flexible load participating in Wholesale Demand Response.
2. **Indirect participation, via retailers** securing DR from their customers (and passing through a fair proportion of the value) in order to reduce their obligations to fund capacity payments based on load at times of system stress.

In relation to the first of these, we outline a form of capacity auction which can proactively support DR and EE participation here: (**Section 5**)

1.3.4.1 DR capacity is low-regrets under forecast uncertainty

Note that a proactive approach to ensure DR participation – with its shorter life-span in general compared with new-build supply-side capacity – is a useful means to guard against poor forecasting leading to superfluous amounts of capacity being funded by consumers for decades to come.

1.3.5 Energy efficiency gains are likely to be cheaper than marginal new capacity

Any reform which targets reliability and seeks to place customers in an appropriate position of control of system costs should encompass the opportunity not just to time-shift demand (via DR) but to minimise it – via EE.

At the margin, investments in EE which permanently reduce demand during periods of low energy supply are likely to be more efficient than investment in marginal new supply-side capacity.[5]

Consumer support for a capacity mechanism is likely to be related to serious efforts to drive EE, via a NEM-wide target under a robust design – perhaps drawing on the architecture of schemes such as the NSW Energy Savings Certificates or other examples.

[4] Submissions from Econalytics and Wattwatchers make clear the opportunity, and we only address this lightly given the more detailed perspectives available from those experts in this sub-sector of the energy system.

[5] Refer to the Econalytics submission in relation to energy efficiency-related capacity provision in US markets including PJM and ISO-New England (and noting also the out-of-market benefits to consumers in terms of health and wellbeing from better-quality more energy efficient insulated homes).

1.4 Other matters

The balance of our submission expands upon several of the above points, particularly the weak case for including currently-existing assets in **Section** 2.

We briefly address several other matters of design in sections 3 to 9, summarised as follows.

1.4.1 Forecasting and procurement (Section 3)

Supporting centralised forecasting and procurement by AEMO, but noting the importance of harnessing retailers in relation to short-term demand forecasts and incentive to reduce demand (including via their customers DR), and ensuring market architecture supports checks and balances against a systems operators' likely tendency to forecast too conservatively.

1.4.2 De-rating and compliance obligation (Section 4)

Supporting both de-rating and compliance being based on either modelled (for derating) or actual (for compliance) Reliability Events – with an overlay of seasonality relevant for (e.g.) seasonal forms of DR.

1.4.3 Auction design for uncertainty and DR / EE participation (Section 5)

Accommodating both forecast uncertainty and DR / EE particularities in the auction process, with progressive auctions to 'build the capacity book' over time, and with a preferential opportunity for DR / EE to contribute.

1.4.4 Supporting, but not underwriting new-entrant risk (Section 6)

Limiting the duration of new-entrant support to guard against underwriting inefficient assets in the long term, given the likelihood of technology cost reductions.

1.4.5 Sensible auction price setting (Section 7)

Ensuring auction price setting are appropriate – with no justification for a floor, and a suggested mechanism to reduce the new-entrant price cap for pre-capacity mechanism existing assets (should they be permitted to participate).

1.4.6 Setting the new MPC (Section 8)

We outline upper and lower boundaries for setting the new, lower MPC and acknowledge that maintaining incentives for necessary levels of VRE investment will require careful optimisation within these limits.

1.4.7 Planning for congested REZs with internal capacity-providing assets (Section 9)

Supporting inter-regional arrangements that are 'down-scalable' to what are likely to be identical issues with intra-regional REZ developments.

2. Participation of existing capacity is a weak case

As noted in the introduction (**Section** 1.3.2), we think existing capacity should not be presumed to receive capacity payments, as a windfall gain in favour of sunk investments (funded by consumers).

Instead, for reasons of equity, the existing (higher) MPC should continue to apply as grandfathering, and the capacity mechanism should be narrowly focussed on supporting new entrant capacity going forward.

Limiting settlement for new capacity to a lower MPC is a relatively simple fix. Alternatively, other (more complex) mechanisms should be developed, as we briefly outlined.

By contrast, the inclusion of existing capacity involves a number of other challenges.

- **Creates complexity and design challenges within the capacity mechanism** – noting the ESB Paper identification of the issue of "*designing support for new capacity that does not overcompensate existing capacity providers*".
- **Introduces the risk of market power being exercised** by the relatively concentrated holders of existing firm capacity.
- **Dilutes the impact of the capacity payment** – which should be primarily an incentive to invest, not an 'incentive not to withdraw unexpectedly' (despite likely unsuitability of any such capacity to operate efficiently in the future system if it cannot at that point).

Given a choice between retroactively funding sunk investments (many of which have no intention of exiting), or diverting some of that value to fund marginal new fit-for-purpose investments in the event of marginally earlier exits of existing capacity, it is not at all clear that it is in consumers' interests to choose the former.

Any barrier to the exit of existing unsuitable and inefficient capacity is in fact, a barrier to entry for new, more efficient capacity.

The ESB Paper is extremely clear on p18 in relation to large thermal capacity, in contradiction to the ESB Paper's presumed inclusion of existing assets:

> *"For the avoidance of doubt, the purpose of a capacity mechanism is not to extend the lifespan of ageing coal generators. These generators face several structural challenges as the NEM transitions to a VRE based system. This is primarily driven by these generators' technical incompatibility with high levels of VRE, resulting in reduced capacity factors and increased maintenance costs. The capacity mechanism would not and cannot address these challenges. Instead, the capacity mechanism would provide more targeted incentives to ensure replacement capacity arrives when it is needed, giving greater assurance that the exit of these generators will be well managed."*

2.1 Strategic nationalisation of coal appears to be underway

Governments have time and again shown their willingness to intervene in energy markets and at least in this case, that may well be the best approach.

In a sense, Australian state and Federal governments are showing their desire to nationalise (in a strategic, if not operational sense) the remaining thermal coal assets, by seeking to influence or (at the extreme) over-ride the exit decisions of the private owners of these assets.

The 'secret war' approach we are seeing is clearly inappropriate and to some extent, it is the cause of hesitation in investment in replacement capacity. Nevertheless, we agree that a version of this approach can be a pragmatic way to co-ordinate orderly exit.

If exits are a political concern, then bilateral government-to-asset agreements to define closure schedules, as we have seen recently with (for example) Yallourn, are a simpler and more pragmatic means of palliative care, and ideally are funded by governments answerable to their taxpayers for the use of funds, not by consumers.

A competitive, transparent version of this process, guided by the ESB's OEMC recommendations (**Section 1.3.2.3**), should not be dismissed.

3. AEMO is best-placed to forecast long-term and procure capacity, but retailer incentives should be harnessed

On balance, we agree with the ESB's proposal for a centralised approach to both forecasting and procurement. In particular, arguments about consistency with related AEMO forecasting like the ESOO, and the benefits of co-ordinated procurement with AEMO as a counterparty are strong.

However, the opportunities to harness retailer self-interest in minimising capacity costs (in particular, via facilitation of customer DR) are potentially very attractive in driving efficiency as well as passing value to consumers. **Basing the retailer obligation on actual demand is therefore a clearly sensible design choice**.

It is also likely that in the near-term, aggregated retailer demand forecasts may be more accurate than an AEMO forecast, and that opportunity for greater forecast accuracy (and associated lower risks of over- or under-procurement of capacity) should also be taken up in the mechanism design to the extent possible.

In general, the risk of AEMO proving to be an overly-cautious forecaster and gold-plating reliability is real, but we think it is better to manage this risk rather than rely on participants (with their more limited capability to forecast at system level in the longer term) to do a better job.

That is not necessarily because we think they wouldn't do a better job… but because of the benefits of centralised transparency in process, and the expectation this is more likely to reduce unhelpful government interventions in future.

Assessment of AEMO's performance is another key role which may be undertaken by a strong, independent Mechanism Monitor (as discussed earlier: Section 1.3.1.1)

While the details of a 'hybrid' model combining the benefits of centralised AEMO and decentralised retailer roles are not yet available, we agree this is an important detailed design opportunity to investigate.

4. De-rating and obligations should both be based on Reliability Events

Assessing de-rating based on a presumed 'at-risk period' runs the risk of an inflexible process that misses the actual circumstances when reliability is under threat, and the ESB Paper is clear that we can expect things to evolve in relation to when Reliability Events arise. But perhaps not predictably: recent events in the NEM highlight the possibility for reliability to come under threat at unexpected times.

In particular, **consumers should not be asked to choose whether their capacity payments will be directed to hot summer afternoons, unplanned outages or dark still days** and bear the risk of that choice being the wrong one.

We agree that alignment between de-rating approach and obligation is desirable, and consider that a good approach may be to base both the de-rating and the obligation on 'actual' Reliability Events:

- **For de-rating**, based on ESOO-consistent modelling of outcomes over a range of conditions (weather years, stochastic forced outages, …). When Reliability Events (or failing that, USE events) occur in the modelling, unit availability should be assessed in that modelled circumstance. We understand this is essentially the 'event-driven at-risk periods' alternative in the ESB Paper.
- **For compliance**, based on actual availability to bid during Reliability Events.

To maintain a pragmatic and sensible level of complexity, common de-rating factors should be applied to 'benchmark' geographically and technically consistent capacity – for example, PV or wind assets in defined zones (perhaps REZs) where there is no reason to expect a material difference in expected availability.

The benchmark can then be scaled for any material technology differences among specific units (turbine size, panel / tracker technology leading to materially different capacity factors, for example).

All such modelled approaches and scaling should be cross-checked against historical actual performance for specific assets, ensuring derating outcomes are sensible and consistent as a whole.

4.1 Seasonal capacity should be accommodated within this

In the case of capacity which is seasonal (for example, DR based on controlled summer air-conditioning) the auction design, de-rating and compliance should account for this seasonality: in this case allowing for capacity payments for capacity provided in part of the year, and assessed on performance during that part of the year.

The Econalytics submission details the treatment of this opportunity in other global markets.

5. Capacity auction process should accommodate both DR / EE and general forecast uncertainty

The ESB Paper suggests a model of a two-stage procurement via auctions at T-4 and T-1, with alignment between capacity auctions and notice of closure requirements.

Other markets such as PJM and France allow for more frequent auctions to procure capacity over time, which allows for adjustment in the forecast need to be progressively accommodated.

We have already noted that some reservation of residual auction capacity at T-1 for DR / EE is desirable. This is because in general, DR capacity will be available in smaller increments and more firmly able to commit closer to T given DR is closely related to operational behaviour. This is quite different from many other forms of capacity which require investment-timeframe notice, in larger increments.

A more flexible approach to address both the evolution of forecasts over time and the availability of DR and EE to contribute is shown in the following table. This design allows for:

1. Each annual auction to true up every year 'T' against the most recent ESOO (or equivalent) forecast.
2. Progressive firming up of DR / EE participation – with a first opportunity to offer capacity in later auctions (but subject to the relevant DR / EE price cap which would be set to ensure a balance between value being provided for consumers in general, with appropriate incentives available for DR / EE providers).

Time	Auction Purpose	Notes
T-4	Contract 85% firm	Most recent forecast sets T-4 Gap 85% of T-4 Gap is auctioned, open to all capacity providers (including DR/EE) to firmly offer and be allocated capacity certificates.
T-3	Adjust and contract to at least 90% firm	Most recent forecast adjusts the residual 15% uncontracted capacity gap up or down – setting the T-3 Gap T-3 Gap is auctioned among DR/EE providers first. If DR/EE offers below the DR/EE price cap do not reduce the capacity gap to 10%, any shortfall is auctioned generally.
T-2	Adjust and contract to at least 95% firm	Most recent forecast adjusts the residual uncontracted capacity gap (if any) up or down – setting the T-2 Gap T-2 Gap is auctioned among DR/EE providers first. If DR/EE offers below the DR/EE price cap do not reduce the capacity gap to 5%, any shortfall is auctioned generally.
T-1	Adjust and contract to 100% firm	Most recent forecast adjusts the residual uncontracted capacity gap (if any) up or down – setting the T-1 Gap T-1 Gap is auctioned among DR/EE providers first. If DR/EE offers below the DR/EE price cap do not reduce the capacity gap to 0%, any shortfall is auctioned generally.

6. New assets should be supported but not underwritten

The longer-term support proposed for new-entrant capacity is appropriate in general – but the duration of the support should balance solid support for the investment case against the risk of technological obsolescence in the longer term.

The mechanism should not continue paying for capacity over a very long period if replacement capacity could be procured more cheaply – for example due to expected learning-curve based cost reduction in technologies such as battery storage[6].

A reasonable balance may be ~5 years, after which the asset would be exposed to competitive annual auctions alongside other existing and new-entrant assets.

[6] Which should be considered in a consistent manner to the ISP, with its reliance on the annual CSIRO GenCost analysis. This ensures the ISP's forecasts of the least-cost system accommodates the expected large differences in the future cost of technologies based on their maturity and cumulative deployment.

7. Auction price settings must be appropriate

There are some elements of the ESB Paper's proposed auction price settings which deserve some further explanation and challenge.

7.1 No justification for a price floor

We are not at all clear why a competitive capacity auction would include a price floor.

It may well be the energy and/or ancillary services markets are attractive enough that required capacity payments may be minimal at times.

This is particularly the case when the most severe consequence of non-compliance is not receiving the capacity payment.

7.2 Price cap must reflect asset status – existing or new

We have previously stated we do not believe existing assets should be included in the mechanism at all.

However, if they are to be, a much lower price cap must apply.

The net-CONE approach is probably a reasonable basis for setting a new-entrant price cap, but the price cap for existing assets should:

- subtract from the net-CONE cap the component related to the return on capital that has been sunk; but
- add an expected value of foregone revenue between the pre- and post-capacity mechanism MPCs, which can be simply estimated as the modelled duration at the (lower) MPC in the year, multiplied by the long-term average 'settlement price premium' when prices have exceeded the lower MPC.[7]

8. MPC setting is critical – a signal for efficient dispatch

Material reduction in the MPC is essential to contribute to the reduction in overall wholesale costs to consumers, in order that average energy prices are lower to more than offset the new costs of the capacity mechanism payments.

This net reduction in cost is necessary for consumers to accept what has previously been energy-only market price risks accepted by generators.

Given this precondition, the MPC should be set at a level that is sufficiently high for all assets to cover their short-run marginal costs (particularly fuel, or in the case of storage, low-cost energy used to charge the storage). If this is the case, assets will be able to bid for efficient dispatch and at least cover these short-run costs.

For VRE assets, capacity payments are likely to be relatively small based on significant de-rating and so reliance on the energy market (and thus the MPC) will be higher. However, VRE assets:

- have very low short-run costs and will deliver significant operating earnings from modest energy prices; and
- are often the cause, not the beneficiary, of very high price intervals when their output is low.

It is an intended consequence of the capacity mechanism that system investment is tilted more towards firmer capacity, storage and responsive demand, less towards VRE.

Nevertheless, within the constraint of an MPC high enough to create efficient dispatch, and low enough to compensate consumers, there is a likely to be an optimum level. This would balances the reliance on energy versus capacity payments in a manner that continues to incentivise necessary levels of investment in VRE as the future source of bulk lowest-cost energy.

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[7] For example, if the new MPC is $1,000/MWh, and historically, for all intervals where price has exceeded $1,000/MWh the average price has been $2,500/MWh, then the settlement price premium foregone by the existing asset is deemed to be is $1,500/MWh.

If modelled prices are expected to hit the MPC in 1% of the trading intervals in T, then the value of this would be 87.6 hours x $1,500/MWh = $131,400. Spread over 8,760 annual hours, this would add $15/MW to the price cap for a 100%-rated asset.

9. Transmission constraints should consider REZ development

While the ESB Paper discusses the issue for inter-regional transmission (via interconnectors), the same issue is likely to arise intra-regionally under REZ developments, with transmission connections that will experience congestion at times of VRE abundance within the REZ.

These REZs should – if the transmission access reform workstream is successful – include substantial storage and flexible load assets directly exposed to the capacity mechanism as an incentive.

Given this, we think the most pragmatic approach is to allow capacity providers to sell capacity in any region, regardless of interconnectors or intra-regional constraints.

We note this is the ESB's preferred approach. Capacity providers being paid can and should manage congestion risks (as they do now in the inter-regional energy markets).

We also note that in a practical sense, this argues for consistency among the state Ministers in relation to which assets are in or out of the capacity mechanism and (related to this) a common MPC across the NEM being maintained.