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Electricity Contract Co-Design Industry Working Group

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CEC Submission to Industry-led Electricity Contract Co-Design Consultation Paper

The Clean Energy Council (CEC) is the peak industry body representing around 1,000 organisations across Australia's clean energy sector. Its membership includes renewable energy, storage and firming developers and generators, network businesses, energy retailers, equipment manufacturers, investors and financiers, professional services firms, constructors and installers. In short, CEC members are responsible for developing, financing, building and operating the renewable energy, storage, network and firming projects that underpin Australia's energy transition and future electricity system. We are committed to accelerating Australia's transition to a clean energy future as rapidly as possible while maintaining secure, reliable and cost-effective electricity supply for customers.

The CEC welcomes the opportunity to provide feedback to the Industry Working Group (IWG) as part of its consultation on the preferred contract structures outlined in its September Consultation Paper.

As we outline below:

- **The process has been fast, yet transparent and consultative.** The Working Group was convened in May 2026 and expects to deliver a final report and recommended contract structures in November 2026 — a little over six months. Despite the compressed timeframe, industry engagement has been strong, with evidence shared and feedback incorporated, particularly regarding bulk energy and shaping products.¹
- **The package delivers what the NEM Review Panel requested.** Fungible products for bulk energy, shaping and firming (proposed to have an 8-hour duration) that can be combined by buyers alongside existing electricity derivative products to hedge a given load shape.² This being said, firming beyond 8-hour duration is a gap that the separately-designed strategic reserve (or some other mechanism) will need to cover and open design questions still need to be resolved, as outlined below.
- **The Regional Reference PPA is a material improvement on the earlier ex-post dispatch-weighted average (DWA) swap for onshore wind** and directly addresses concerns that a fixed contracted volume would leave wind developers with a level of shape risk that would not be bankable, while still providing value for buyers. The principal residual risk for onshore wind is basis risk vs the Reference Fleet, which may additionally shift over time as the composition of the Reference Fleet changes across the life of the ESEM contract. We recommend a defined, rules-based mechanism for managing Reference Fleet evolution to maximise clarity and to support planning/forecasting activity.

¹ASL, [Industry-led Electricity Contract Co-Design – Consultation Paper](#), September 2026, 'Overview' and 'Current Status'.

²NEM Wholesale Market Settings Review Panel, [Final Report](#), December 2025, Chapter 5, Recommendation 10A and Table 5 (proposed definitions of services).

- **Several key design questions remain open that will strongly impact the success of the contracts proposed**, most notably the negative price provision and definition of the reference fleet and index for bulk energy; the definition of Residual Demand and management of coordination challenges for shaping; the degree of linkage between the \$600 strike, the Administered Price Cap (APC) and the exposure cap for the bulk energy product for firming; and the allocation of force majeure (FM) risk for all three contract types. These are explored in detail below.
- **Work outside the Working Group's Terms of Reference will also play a key part in whether these contracts succeed.** In particular, the form and level of the spot market price settings (currently under review by the AEMC), the anticipated entry trajectories (proposed to be set by the jurisdictions then translated to tender schedules by the ESEMA), and the design of the strategic reserve (under separate consideration outside the IWG) will each materially affect how these contracts are valued and whether they are collectively sufficient to unlock efficient investment in the National Electricity Market (NEM).
- **The gap between CIS and ESEM auctions needs to be actively considered.** Given that no further dispatchable CIS tenders are anticipated beyond the current round and the status and timeline of any future generation CIS tenders has not been announced, there is potentially a material gap between the last CIS tenders and the first ESEM tender. While not a matter for the IWG, consideration should be given to formally extending the CIS program into 2027 to ensure stable investment conditions leading into commencement of ESEM auctions.

1. Observations on the co-design process

1.1 Duration and industry engagement

The Working Group was convened in May 2026 and is expected to deliver a final report and proposed contract term sheets in November 2026. In that window it has run five workshops (including Workshop 3b), published minutes and materials from each (including detailed analysis), held public webinars, taken presentations from industry participants, engaged directly with peak bodies, and now released draft product sheets for formal public consultation.³

We particularly acknowledge two aspects of the approach taken by the working group. First, it published its evaluation criteria and its long-list before narrowing, which allowed the market to understand not just what was chosen but what was rejected and why. Second, it revisited its own preliminary positions and continues to take a transparent evidence-based approach. The contract forms prioritised mid-process — an ex-post DWA price swap for bulk energy and a nominated-block time-of-day spread for shaping — are not the structures now preferred. That willingness to change position in response to analysis and feedback is strong evidence that the process worked as intended.

1.2 Deviations from the process envisaged by the panel

Timing

The Panel's Implementation Roadmap contemplated a transitional co-design process running Q1–Q2 2026, delivering a contract recommendation by Q2 2026.⁴ In practice the Working Group was convened in May 2026 and will report in November 2026 — roughly two quarters later than envisaged, but with a longer and more consultative process than the Panel's original timetable allowed, which we view as a material net improvement.

The challenge moving forward is now ensuring the long-form drafting, International Swaps and Derivatives Association (ISDA) documentation, index construction and the operational build-out required by exchanges, brokers and clearers is completed ahead of the intended first ESEM tender in late 2027, which we view as an achievable but aggressive timetable.

Convening arrangements

The Panel recommended the AER and the ESEM Administrator co-convene the process. The current Working Group was appointed by a Convening Group of NEMRIT and ASL, with the AER as an observer.⁵ The parallel NEM Review Implementation regulatory package confirms this as the enduring position: the ESEM Administrator (ESEMA) will be the sole contract co-design convenor, with the AER consulted rather than co-convening.⁶

This makes sense as it ensures clear ownership of the convening process by the entity that will most immediately rely on its outputs (the ESEMA), while ensuring the AER retains the involvement it will need to effectively discharge its responsibilities in relation to the MMO and in setting DMO methodologies and tariffs.

Interaction with the market price settings review

³ASL, [Consultation Paper](#), 'Overview' and 'Current Status'; workshop minutes and materials are published at [asl.org.au — Industry-led Electricity Contract Co-Design](#).

⁴NEM Review Panel, [Supplementary Materials](#), Section 1, Recommendation 7, steps (i)–(iii).

⁵ASL, [Consultation Paper](#), 'Contract Co-Design Process'.

⁶DCCEE, [National Electricity Market Wholesale Market Settings Regulatory Reforms – Consultation Paper](#), Section 2.1.4 (Contract co-design).

The Panel was explicit that the co-design process should run concurrently with, and be informed by, the Reliability Panel's review of the form of the market price settings, because those settings "play a significant role in shaping expected future revenue opportunities and allocation of risk".⁷ That concurrency has not been achieved in this cycle.

Energy Ministers have instead asked the AEMC (not the Reliability Panel) to undertake a comprehensive review of the NEM-wide reliability standard and settings framework, with final recommendations due by the end of 2027 — after the Working Group reports and, on current timetables, around the time of the first ESEM tender.⁸ To enable an efficient tender process, based on well-informed bids, it is important that this pricing review be completed as early as possible and certainly before the tender process.

1.3 The proposed four-yearly cadence

The regulatory package provides for the ESEMA to convene an industry-led co-design process every four years, with additional processes if the convenor considers them necessary.⁹

This makes sense as a default frequency as it aligns with the RSSR, the AER's MMO review and the AEMC's normal cadence of wholesale price settings reviews, which is what the Panel intended and what allows contract design, market price settings and liquidity obligations to move together rather than against each other.

Several potential improvements could be considered in our view:

- **The trigger for an off-cycle process should be objective and observable, not solely a matter of convenor discretion.** The Panel suggested the AER survey market participants to test whether the contract set remains fit for purpose. Building on this, we recommend the ESEMA be required to run a structured market survey at least every two years and to publish the results, with a defined threshold of participant dissatisfaction obliging it to either convene an off-cycle process or publish reasons for not doing so.
- **The first review should be brought forward.** The initial contract set will be designed before the first tender has run, before any contract has been recycled, and before the market price settings review has concluded. A review at four years would not occur until well after the first several tenders. We recommend the first enduring review be scheduled to commence no later than two years after the first ESEM procurement round, so that the design can be corrected if needed in a timely manner.
- **Incorporate an objective test of contract adequacy as an initial step in the 4-yearly cycle.** Stability of contracts over time is beneficial for liquidity and changes should be limited to circumstances in which there is a material need, as determined against an objective set of criteria.
- **The sequencing should be explicitly managed.** In particular, future co-design activity would logically benefit from being able to treat updated wholesale price settings and RSSR findings as inputs. The AER would likewise benefit from taking IWG feedback as input to MMO reviews (and should be required to do so).

⁷NEM Review Panel, [Supplementary Materials](#), Section 2.1 (Long-term outlook discussion paper) and Section 2.2; [Final Report](#), Recommendation 5.

⁸DCCEEW, [Regulatory Reforms Consultation Paper](#), Section 2.2.1, Step 1.

⁹DCCEEW, [Regulatory Reforms Consultation Paper](#), Section 2.1.4.

2. Bulk energy — the Regional Reference PPA

The pilot co-design Working Group convened by the Panel in late 2025 proposed an ex-post dispatch-weighted average (DWA) swap as the contract structure for bulk energy.¹⁰

Under that structure, the contracted volume is fixed ex ante, whereas with a Regional Reference PPA, the contracted volume in each trading interval is set by the Reference Production Index, which is derived from the actual dispatched output of the regional Reference Fleet.

This means that a wind farm experiencing a regional wind drought sees its contracted volume fall with it, reducing its exposure to potentially high prices during that time, addressing a key concern with the prior structure.

2.1 Balancing bankability, fungibility and simplicity

Bankability: good, and materially better than the alternatives considered. Removing the fixed volume obligation removes the largest single risk that existed in the Ex-post DWA Swap under consideration previously. What remains is basis risk — the difference between an individual project's generation profile and the Reference Fleet's. The treatment of negative price periods and FM risk and the rules defining how the Reference Fleet and associated index are developed and revised will also be key contributors to the ultimate bankability (or not) of the product.

Fungibility: strong. Settlement depends only on the Reference Production Index, the spot price and the strike. It is independent of the seller's asset, so the contract can be novated, recycled or bought back without reference to the underlying project.

Simplicity: adequate, the reference indices being the key. The contract mechanics are simple, with the complexity sitting in the definition and evolution of the Reference Fleet.

2.2 Technology-specific implications

For solar, the gap to a project-specific PPA is modest. Solar output within a region is highly correlated across sites: the resource is driven by a single, spatially broad diurnal signal, and plant-level variation is dominated by cloud, tilt, tracking and degradation rather than by fundamentally different resource timing. We would expect a Regional Reference PPA to work well for solar PV projects.

For onshore wind, the gap is wider and site-specific. Two wind farms in the same NEM region can have materially different diurnal and seasonal shapes. This has historically – and rightly – been understood as an advantage of wind, as it brings greater diversity to the generation fleet and hence more stable average output, higher average network utilisation and lower system cost.

A core challenge with the Ex-post DWA Swap structure considered previously was that it strongly encouraged assets with output profiles similar or identical to the reference shape, effectively discouraging assets that were helping to diversify and smooth the aggregate output profile.

The Regional Reference PPA structure proposed addresses this issue – assets with a more valuable shape vs the regional reference index, as measured by wholesale market prices, will benefit, as the value of their 'overs' will exceed the value of their 'unders' when deviations from the reference are settled.

¹⁰NEM Review Panel, [Supplementary Materials](#), Section 4.1, 'Summarised recommendations' and 'Bulk energy'.

2.3 Does the regional reference index adequately address shape risk?

- **Volume risk: substantially removed.** The seller is not required to deliver a fixed quantity.
- **Systemic shape risk: substantially removed.** If the whole regional wind fleet is producing (or not) at an unfavourable time, the Index reflects that and contract volume adjusts accordingly.
- **Idiosyncratic shape risk: retained, and transferred to the seller.** The difference between an individual project's shape and the Reference Fleet's shape is the seller's to manage. While this doesn't mean the risk goes away or is without cost, it at least places the risk with the party best placed to manage it, as it is the seller who makes the call on asset location (and hence output profile) during project development and siting.

On the buy side, the structure works well. Buyers receive a regional technology shape rather than a single plant's output, which is more diversified, more predictable in aggregate, and more readily combined with shaping and firming products. That is precisely the fungibility outcome the Panel sought.

The Index is defined by all Operational projects of the specified Technology in the specified Region with nameplate capacity of 30 MW or greater.¹¹ Over a fifteen-year contract period, that fleet will change substantially and the Reference Fleet's shape will therefore drift. A project that is well-matched to the fleet at financial close may be poorly matched a decade later, through no act or omission of its own, and with no ability to re-site.¹² As such, the mechanisms for managing Reference Fleet change over time need to be carefully considered.

While sellers will favour an approach that fixes the fleet at contract commencement or places limits on how it evolves over time, this would have countervailing impacts on fungibility and usefulness to buyers, particularly over longer tenors. In the CEC's view the most important thing is for a clear and deliberate decision to be made on the approach, which should then be reflected in a clearly-defined, rules-based mechanism that buy and sell side participants can forecast and manage against.

2.4 Responses to the consultation questions — Regional Reference PPA

Question 1: Is the proposed contract structure suitable for a range of bulk energy technologies?

Solar PV: good fit. High intra-regional correlation means a Reference Fleet index would be expected to track an individual plant closely. We would expect bids to reflect a small basis premium.

Onshore wind: workable, but definition and evolution of the Reference Fleet will be key and the mechanisms governing this should be clearly specified and rules-based.

Offshore wind: unclear. The consultation paper excludes special tenders for technologies including offshore wind.¹³ Clarification is sought on whether offshore wind is to be a separate technology with its own Reference Fleet under a Regional Reference PPA structure (which is not without challenges given there would be few if any operational projects to index against) or whether an alternative contract structure would be used (noting the Victorian government has proposed a mixed availability payment + CFD structure for its first offshore wind tender).

¹¹ASL, [Consultation Paper](#), 'Bulk Energy: Regional Reference PPA — Overview of proposed contract structure'.

¹²NEM Review Panel, [Supplementary Materials](#), Section 4.2, Baringa/CEIG, 'Idiosyncratic risk comparison — developer considerations'.

¹³ASL, [Consultation Paper](#), 'Consultation scope'.

Question 2: Does a cap on spot price exposure aligned to the strike price of the firming product (e.g. \$600/MWh) appropriately balance risks for sellers and buyers?

We support a cap and aligning it to the firming strike price makes sense:

- Without a cap, a bulk energy seller settling against Index volume during an extreme price event faces exposure limited only by the market price cap. That is not a risk a variable renewable generator can bear without some kind of hedge in place.
- It creates a clean internal consistency across the package: above \$600/MWh, exposure sits with the firming product, aligned with the Panel's recommendations.

This being said, tying the bulk energy cap to the firming strike means one parameter now determines the risk profile of two of the three products. If the AEMC's review of the reliability standard and settings framework results in a change to the APC, or to the form of the settings more broadly, the firming strike will come under pressure to move — and the bulk energy product will need to move with it.

Consideration should be given as to whether the link should be expressed as a hard reference to the firming strike (so the two always move together). It may also be appropriate to revisit the level of the firming strike price to consider the interactions with, and impact on, the bulk energy contract.

Question 3: Is a negative price provision required, and if so, is a volume knock-out or a \$0 price floor preferable?

A negative price provision is required and a \$0 price floor is generally preferred by CEC members to a volume knock-out mechanism, on the basis it provides more stable cashflow outcomes for sellers, while still ensuring there is no incentive to generate during negative price periods. It is also seen to be better aligned with standard practice in PPA contracts and hence more bankable than a volume knock-out.

A related point to be considered is how the Regional Reference Index will deal with negative price periods, as logical curtailment behaviour by generators responding to the \$0 price floor would affect settlement volumes across the fleet. Usage of an Unconstrained Intermittent Generation Forecast (UIGF) during negative price periods may help reduce the potential for unintended interactions between spot prices and the index.

Question 4: Does the proposed design of the Reference Production Index appropriately balance risks for sellers (primarily basis risk) and buyers (long-term value of the product)?

Dispatched output is objectively measurable from existing AEMO settlement data, reflecting the real physical and network conditions that affect the fleet. As such it makes sense to calculate the Reference Production Index using this data for the Reference Fleet.

This being said, clarity on how the index is defined and how it will evolve is vital. As drafted, the seller bears both the initial basis risk (which it can to some degree choose and manage through site selection) and the evolutionary basis risk (which it cannot so easily choose or avoid). To ensure this risk is efficiently understood and priced, it is vital that the definition and evolution of the Reference Fleet is based on clear rules and governance procedures.

It is also important that the index incorporates MLF for the reference fleet. Doing so would mean sellers face the difference between fleet MLF and their project's MLF, rather than the full project-level MLF. Buyers would face the aggregated/diversified fleet level MLF. CEC members view this as striking the right balance, as buyers would take the systemic portion of the risk while sellers would take the idiosyncratic/project-specific portion.

3. Shaping — the Dynamic Time of Day Block Spread Swap

The Dynamic Time of Day Block Spread Swap aims to take the strengths of both heads-and-tails and block spread products. It retains the block construct, so a buyer is hedging a defined window it can identify in advance; but the blocks are determined daily from day-ahead forecasts of Residual Demand, so the windows migrate as the shape of net demand migrates. It permits up to two charge and two discharge blocks per day, each at least 30 minutes, which allows the product to hedge both the morning and evening peaks rather than only the largest single spread.¹⁴

This directly addresses the single most serious long-tenor flaw in fixed blocks — obsolescence — while giving buyers a day-ahead-known window rather than a purely ex-post outcome. Sellers benefit too: day-ahead visibility of the charge and discharge windows supports operational decision-making in a way that an ex-post heads-and-tails calculation does not.

3.1 Balancing bankability, fungibility and simplicity

Fungibility: strong. Settlement depends only on published spot prices and a published block determination. It is fully independent of the asset.

Bankability: good. The seller receives a fixed spread premium, which is a stable, predictable revenue line — vital in securing debt finance. The seller's ability to defend that premium depends on whether its asset can physically capture the dynamically determined spread, which the seller is best-placed to manage in the design of the asset and definition of its ESEM bid parameters.

Simplicity: low, but workable. The contract requires the market to understand a Residual Demand forecast, a day-ahead block determination algorithm, a 4pm nomination process, and a shaping day that begins and ends at 09:05/09:00 (i.e. different to the NEM and ASX). This is not straightforward, but is workable in our assessment and justified by the bankability and fungibility benefits the proposed contract structure brings.

3.2 Technology-specific implications

Lithium-ion batteries. Best fit of the storage technologies. Fast response, high round-trip efficiency, and the ability to respond to a 4pm day-ahead nomination without difficulty. The principal residual exposures are degradation from the cycling required to defend the spread, the risk that two discharge blocks in a day exceed the asset's energy capacity, and the opportunity cost of foregone FCAS revenue during contracted windows.

Flow batteries. Long cycle life and depth-of-discharge tolerance make defending a daily spread less damaging than for lithium-ion, and the absence of meaningful cycle degradation is a genuine advantage for a product that requires daily cycling. However their economics favour longer durations than the shaping product is designed to compensate.

Compressed air, liquid air, compressed CO₂. Long duration and long asset life, but as with flow batteries, the economics of these technologies tends to improve at longer durations, which the shaping product does not support.

Pumped hydro. Pumped hydro can defend an intra-day spread comfortably and its long life and low degradation are well-matched to a daily-cycling product. But pumped hydro economics are dominated by large up-front capital cost amortised over many decades and much longer durations and as such, the shaping product is not expected to support investment in pumped hydro.

¹⁴ASL, [Consultation Paper](#), 'Shaping: Dynamic Time of Day Block Spread Swap — Overview'.

3.3 Responses to the consultation questions — Dynamic ToD Block Spread Swap

Question 5: Does the proposed approach to determining charge/discharge periods on a day-ahead basis, using residual demand calculation, appropriately balance operational risks/simplicity with long-term value?

We support the dynamic approach and consider Residual Demand the right determinant. This approach maintains alignment with bulk energy from renewable generation as a determinant of the charge / discharge periods requiring shaping services, providing coordination across bulk energy and shaping products. This being said, we note there are several elements warranting further attention, as outlined below.

The pilot analysis showed that the hours in which the lowest and highest prices occur have migrated substantially over the past decade — low prices moved from overnight to the middle of the day, and morning peak prices became markedly less common — and that defined-time spreads failed to track the growth in actual spreads as a result. A fixed-block product with a fifteen-year tenor would very likely be materially mis-specified by the time it settles. The dynamic approach largely removes that risk, and in doing so directly serves the “adaptable to the future market” criterion the Working Group adopted.

We note several operational aspects still need to be worked through:

- The block determination algorithm must be fully published, deterministic and reproducible. Any participant with the published Residual Demand forecast should be able to compute the blocks independently and arrive at the same answer.
- The block determination algorithm must carefully consider adjacent trading days to avoid situations in which (for example) discharge periods on sequential days are scheduled adjacent to one another, without a sufficient charge period between them.
- Consideration should be given to whether a maximum total contracted duration per day is required or beneficial.
- Careful consideration is also required to avoid unintended consequences in practice. For instance, if the largest Residual Demand on a given day is exceeded by the collective capacity holding shaping contracts, some sort of secondary mechanism may be needed to avoid overshooting.

Question 6: Does the use of AEMO’s forecast data to determine shaping periods result in any material risks to the usability of this contract over the long-term?

We support the use of AEMO forecast data in determining shaping periods, noting several related matters remain open:

- **Governance.** AEMO’s forecasting processes are designed and governed for power system operation and planning, not as financial benchmarks. Once a forecast series determines the settlement of long-dated derivative contracts, it acquires benchmark characteristics: it needs version control, a defined vintage used for settlement, a published correction policy, and a change-management process that requires consultation before methodology changes take effect.
- **Methodology change over a long tenor.** AEMO reasonably improves its forecasting methodology over time. Over a fifteen-year contract, a methodology change could shift the block determination systematically without any change in underlying market conditions. We recommend the final report specify what happens if AEMO materially changes the Residual

Demand methodology, and whether contracts settle against the methodology in force at execution or at settlement.

- **Definitional stability.** “Residual Demand” must be defined precisely and stably — in particular, its treatment of distributed PV, of scheduled and semi-scheduled generation, of storage charging, and of price-responsive load as those resources become visible or scheduled under the Market Visibility Framework. A definition that shifts as the visibility framework is implemented would be a source of unpriced risk.
- **Discontinuity and fallback.** The contract must specify what happens if the forecast is not published, is published late, or is published in error: does the previous day’s block structure apply, a default structure, or a fallback calculation? Sellers cannot manage an undefined outcome and lenders will not accept one.
- **Forecast accuracy.** The reliability of weather forecasting and the characteristics of the fleet in each jurisdiction will ultimately drive the degree to which Residual Demand forecasts reflect real-time outcomes. While no forecast is perfect, the framework should ensure unders and overs can be addressed as efficiently as possible in the spot market.

Question 7: Does the proposed approach of determining nominations at 4pm on a day-ahead basis pose any material operational risks?

A 4pm day-ahead determination provides roughly 17 hours of notice before the shaping day commences at 09:05, which is ample for battery state-of-charge planning, and sufficient for slower-responding mechanical storage to plan a cycle.

This being said, if a large volume of shaping contracts all have their blocks determined at 4pm, there will be a concentrated period each afternoon in which participants reassess positions. This is manageable but should be anticipated by exchanges and platforms.

Question 8: Does the proposed Daily Shaping Period commencing at the Trading Interval ending 09:05 and finishing at the Trading Interval ending 09:00 the following day pose any material operational risks?

We understand the design rationale: a 09:05 to 09:00 day keeps both the morning and evening peaks of a single physical evening within one contract day.

We note several points for consideration:

- **Settlement and reporting alignment.** The contract day will not align with the AEMO trading day (4am – 3:59am)¹⁵, or the ASX trading hours for existing swap and cap products (10am-4pm)¹⁶.
- **Boundary treatment.** The treatment of the first and last contract days of a contract period and of market suspension or administered pricing periods that straddle the 09:00 boundary needs to be clearly defined.
- **Consistency across the package.** If the bulk energy and firming products settle on a conventional trading day, this approach creates a point of difference between those products and the shaping product.

4. Firming — the \$600 Cap

¹⁵ AEMC, National Electricity Rules ([NER - v254 - Full.pdf](#))

¹⁶ ASX, [Energy and environment derivatives trading hours](#)

The pilot Working Group identified caps as the preferred contract to support firming services, explicitly leaving the strike price to the formal process.¹⁷ Having considered different strike price options (\$300, \$600), the Working Group has proposed \$600, on the basis that it allows sellers to retain greater merchant revenue below the cap and is expected to reduce required premiums while preserving buyer value.¹⁸ This is the contract structure that has shifted the least from what was originally proposed.

4.1 Balancing bankability, fungibility and simplicity

Fungibility: strong. Caps are a well-established NEM instrument, listed on the ASX, with an observable forward curve and an existing clearing infrastructure, albeit at a lower strike price.¹⁹

Bankability: strong, within the constraint of an 8-hour product. A fixed premium on nominated capacity, payable regardless of dispatch, is the closest thing in the derivatives market to an availability payment. This being said, as noted below, the contract as currently described does not provide meaningful investment signals for firming and storage technologies beyond 8-hour duration.

Simplicity: high. A cap is the most readily understood instrument in the set, and moving the strike from \$300 to \$600 does not change the fundamentals of this.

4.2 The cumulative price threshold and the risk of shortfalls longer than eight hours

The NEM Review Panel defined firming as capacity “capable of being dispatched continuously for the time it takes to reach the cumulative price threshold if prices are at the market price cap” — currently this is 8 hours.^{20, 21}

This creates a potential issue, with reliability risk in the NEM shifting from short summer demand peaks to extended winter energy shortfalls, driven by periods of low wind and low solar output, which can persist for days rather than hours. Very simply, a product calibrated to an eight-hour service will not fund assets whose distinguishing characteristic is that they can run much longer.

The regulatory package provides that the ESEMA may define additional eligibility criteria, such as the ability of projects to provide 8 hours of services over a number of successive days. The ESEMA is also empowered to facilitate procurement of out-of-market strategic reserves to cover high-impact, low-likelihood events, or temporary arrangements in advance of generator exit, at the direction of a participating jurisdiction, with costs recovered from that jurisdiction.²²

On its face this is the right instrument for exactly the events the cap does not cover, however we see several issues in this approach:

- **It is discretionary and jurisdictional, not systematic.** A strategic reserve exists only if a jurisdiction directs the ESEMA to procure one and agrees to pay for it. The gap between an eight-hour firming product and a multi-day shortfall is a structural feature of the contract design, present in every region. Leaving its mitigation to individual jurisdictional decisions means the coverage of a national market design problem will be uneven.
- **The advisory chain has been weakened relative to the Panel’s recommendation.** The Panel recommended jurisdictions procure strategic reserves on advice from the Reliability

¹⁷NEM Review Panel, [Supplementary Materials](#), Section 4.1, ‘Firming’ and ‘Summarised recommendations’.

¹⁸ASL, [Consultation Paper](#), ‘Firming — Supporting Rationale’.

¹⁹[ASX Energy — Australian electricity derivatives](#).

²⁰AEMC, [AEMC updates market price cap for 2026-27 | AEMC](#); (MPC: \$23,200/MWh; CPT: \$2,225,900/MWh)

²¹NEM Review Panel, [Final Report](#), Table 5 (proposed definitions of services) and accompanying footnote.

²²DCCEE, [Regulatory Reforms Consultation Paper](#), Section 2.2.5 (Strategic reserves).

Panel, which would provide plain-English advice on the probability, length and depth of events that may occur.²³ The regulatory package instead provides that procurement requirements will be set by the relevant jurisdiction and the ESEMA in consultation with market bodies, which feels weaker from a process perspective.²⁴

- **Out-of-market reserve contracts are non-fungible and separately funded.** Strategic reserve contracts are bespoke, physically linked and non-fungible. That may well be appropriate for the service, but it means a long-duration asset seeking to be financed partly on firming and partly on reserve revenue faces two entirely different contracting regimes with different counterparty and cost recovery arrangements.
- **Sequencing.** Strategic reserve design is being developed in the NEMRIT stream while the firming contract is being finalised by the IWG. If the reserve is slow to arrive, the eight-hour gap will remain unaddressed.

Other things being equal, longer-duration assets have a higher likelihood of being able to continue generating throughout an Administered Price Period, particularly when the circumstances underlying the Administered Price Period may not have been foreseen far enough in advance for shorter duration assets to pre-emptively charge. Absent further detail on the design and implementation of the strategic reserve and/or Special Purpose Procurements (SPPs), it is unclear how investment in these kinds of assets is to be supported.

4.3 Technology-specific implications

- **Open-cycle gas turbines.** OCGTs have defended cap contracts in the NEM for two decades; the lending market understands the risk. The binding constraints are fuel supply and transport arrangements over the contract tenor, and emissions policy. On the latter we note the Panel recommended governments clarify how greenhouse gas emissions targets apply to projects procured to provide firming, precisely to give investors certainty.²⁵ Until that clarity exists, OCGT bidders must price an unquantified policy risk into a fifteen-year contract.
- **Lithium-ion, flow and other batteries.** Longer duration Li-ion batteries should be able to participate, as well as flow batteries and other types of battery technology.
- **Compressed air, liquid air and compressed CO₂.** Physically well-suited to a 8-hour duration service, albeit arguably even better suited to longer durations that are not compensated in the current proposed firming contract structure.
- **Pumped hydro.** While the physical characteristics of pumped hydro are well-suited to this kind of service, its economics favour materially longer durations – i.e. inter-day shaping/firming services, which are not currently within scope for IWG. While the Panel acknowledged this, proposing ‘Special Purpose Procurements’ (SPPs) for pumped hydro, no such procurements are currently planned.²⁶

4.4 Response to the consultation question — \$600 Cap

Question 9: Is a \$600 cap, in comparison to a \$300 cap, appropriate to support the entry of new firming assets? If not, why?

²³NEM Review Panel, [Final Report](#), Recommendation 10D; [Supplementary Materials](#), Section 6.1, Part 2.3.7.

²⁴DCCEE, [Regulatory Reforms Consultation Paper](#), Section 2.2.5, ‘Key changes’.

²⁵NEM Review Panel, [Final Report](#), Recommendation 11A.

²⁶NEM Review Panel, [Final Report](#), Recommendation 10A and Chapter 5, ‘Barriers to deployment of some technologies’.

We consider it better suited to supporting new entry than \$300:

- **It preserves more merchant upside for the seller, which should lower the required premium.** A seller retains all value between \$300 and \$600/MWh, a band that will be increasingly frequently traversed in a sharper, more weather-dependent market.
- **It preserves the investment signal.** A \$300 cap truncates the seller's revenue at a level that is now routinely exceeded. A higher strike price means the spot market continues to do more of the work of signalling scarcity, consistent with the approach proposed by the Panel.
- **It enables the clean interlock with the bulk energy product.** As discussed above, a common \$600 reference means a buyer holding both products is protected from extreme price exposure.

This being said, we note the following implications for consideration:

- **The \$600 anchor is doing triple duty.** It is simultaneously the firming strike, the Floating Price cap on the bulk energy product, and the current APC. Anchoring three things to one parameter is efficient, providing that parameter is stable and the linkages are clearly defined.
- **The parameter is under review.** The AEMC will review the reliability standard and settings framework with final recommendations due to Energy Ministers by the end of 2027.²⁷ The Panel separately recommended the Reliability Panel provide a long-term outlook on the form of the market price settings, and canvassed materially different forms — a stepped market price cap and an inframarginal APC — either of which would change the meaning of a \$600 strike and hence may need to be cascaded into future iterations of the product.²⁸

5. Common contract features

Question 10: Are there any concerns with the proposed weekly settlement approach, aligned to the AEMO settlement calendar?

Aligning derivative settlement with the physical settlement cycle reduces working capital requirements. It also sits well with the shortening of the settlement cycle, now flowing through the National Electricity Rules.

It is, however, a change from current practice for all three services:

- **Firming — existing \$300 caps.** ASX-listed electricity derivatives are quarterly contracts settled through ASX Clear (Futures), with daily variation margining rather than weekly cash settlement of contract position.²⁹
- **Shaping — tolling agreements.** Virtual tolling agreements in the market today are commonly settled monthly³⁰, aligned to availability and nomination periods. Weekly settlement increases administrative frequency but improves cashflow predictability.
- **Bulk energy — project PPAs.** Project PPAs are typically settled monthly against metered output, invoiced in arrears. Weekly settlement against an ex-post index is a substantially different operational process. For sellers it is an improvement in working capital terms. The practical requirement is that the Reference Production Index be finalised and published in time to support weekly settlement, including where AEMO settlement data is subsequently revised.

²⁷DCCEEW, [Regulatory Reforms Consultation Paper](#), Section 2.2.1, Step 1.

²⁸NEM Review Panel, [Final Report](#), Recommendation 5 and Chapter 3, 'Hypothetical examples of alternative forms of market price settings'.

²⁹[ASX Energy — Australian electricity derivatives](#).

³⁰Energy Storage News, [Virtual Battery Tolls Explained](#)

Question 11: Are alternate approaches to manage force majeure risk exposure (outside of the contracts) required to support the entry of new assets?

Recent NEM investment has been enabled by long-term physical offtakes tied to specific assets, which typically contain asset-specific force majeure (FM) relief. The ESEM will use fungible financial products that are not tied to the underlying asset, so that relief disappears. The Panel's answer was that proponents should be able to buy back their sold positions either in market or from the ESEMA, and thereby hedge their positions in case of a FM event.³¹

While sound in theory, this faces some challenges in practice, including:

- **Buy-back requires liquidity.** Particularly in the early years of implementation, this may not be readily available.
- **Buy-back requires capital at the moment capital is most constrained.** A project that has just suffered a catastrophic physical event faces repair costs, insurance claims and suspended revenue. Requiring it simultaneously to fund the purchase of an offsetting position at whatever the prevailing price happens to be is procyclical, particularly for larger projects whose withdrawn capacity may itself contribute to price increases and volatility.

The above being said, buyers of swaps and caps today are not exposed to the seller's FM risk, and the same must be true in future for the contracts to be genuinely fungible.

Within that constraint, we see three broad possibilities for FM risk:

- **Retained by developers and asset owners:** This is the least efficient allocation: FM risk at an individual project is close to uncorrelated across a large portfolio, so it is a textbook candidate for pooling. Leaving each proponent to self-insure means the risk is priced at the single-asset level and paid for many times over across the fleet.
- **Pooled and diversified, with the pool managed alongside the ESEM agreements:** This is the Working Group's own suggestion and we support exploring it. Pooling across a portfolio of projects spanning multiple technologies, regions and weather systems substantially diversifies the risk. A mutualised pool funded by a levy on ESEM contract volume, sized actuarially and held by or alongside the FME, would be materially cheaper in aggregate than the same risk retained project-by-project. Since we are dealing with risks that are by definition challenging to foresee or mitigate, a philosophy of placing them with the party best-placed to diversify them would be the logical optimum. Given its role and scale, the FME would be a natural choice to play that role. To maximise the diversification benefit, it would make sense to adopt a standard FM definition across ESEM contract types to the extent possible.
- **Transferred to commercial insurance or capital markets:** A pool need not retain the risk it aggregates. Once aggregated and actuarially defined, it becomes an insurable portfolio, and the pool administrator could sell down the position to the insurance or reinsurance market. This could be considered as a subsequent step once the FME and ESEM are well established and the FME is holding a material FM risk position across its portfolio of projects.

Whichever approach (or combination of approaches) is taken, it needs to be landed rapidly to ensure it is in place and well understood prior to the first ESEM auction in late 2027. This includes providing clarity on the events that will qualify for FM relief, noting CEC members regard the inclusion of events such network failure (beyond the asset boundary) as standard inclusions.

³¹ASL, [Consultation Paper](#), 'Common Contract Features — Force Majeure'; NEM Review Panel, [Final Report](#), Recommendation 10A.

6. Overarching feedback

Question 12: Do the proposed contract structures achieve the Working Group's Terms of Reference and perform well against the identified evaluation criteria?

Our assessment against each criterion follows.

Fungible: Achieved. All three contracts settle against published references independent of any individual asset. This should enable all contracts procured through the ESEM to be recycled back to the contract market and repackaged through the secondary market as required. This will help achieve the ultimate objective of fungibility to increase access, competition and liquidity to improve the forward price signals for the market.

Bankable: Achieved for firming in relation to OCGTs. Achieved for bulk energy for solar and achieved for wind conditional on the Reference Fleet definition and evolution being appropriately specified and rules-based and negative price treatment appropriately resolved. Achieved for shaping in relation to Li-ion battery storage. The gap is for firming and storage technologies with durations longer than 8 hours, noting that the definition of firming and the design of this kind of longer-duration product were outside the terms of reference for the industry working group.

Operationally achievable: We note that two of the three contracts depend on indices that do not yet formally exist, based on benchmark governance arrangements that have not yet been established. Given the target to complete the first tender in late 2027, there is plenty still to do in working through these important details.

Efficient at allocating risks: Largely achieved. Bulk energy volume and systemic shape risk sit with the buyer via the index and idiosyncratic performance risk sits with the seller. Extreme price risk sits with the firming product. The shaping product allows buyers to protect against exposure to the highest residual demand (and likely highest price) times of the day in a way that remains dynamic over time.

Attractive for sellers and buyers: For sellers, yes, with the technology-specific qualifications above. For buyers, we note the structures preserve the ability to combine ESEM products with each other and with baseload swap and cap products, giving flexibility to hedge different load shapes.

Adaptable to the future market: Largely achieved. The shaping and bulk energy products are defined in ways that anchor to market conditions of the day and are hence adaptable by design. The residual adaptability risk is the \$600 strike on the firming product, which may need to evolve to retain alignment with the APC as it evolves. If and when this occurs, any exposure cap built into the bulk energy products may likewise need to evolve.

Complementary within a set: Largely achieved. The proposed \$600 cap on exposure in the bulk energy product aligns with the strike price on the firming product and the current APC, enabling clear and continuous coverage. The gap noted is for firming beyond 8 hours in duration, which was outside the scope of the current co-design process.

Simple to value: Achieved for firming, as it is based on an existing product that is well understood. Not yet achieved for bulk energy or shaping as the indices they are to be priced against still need to be developed (this is not a criticism so much as a process observation).

Question 13: Are there any concerns with the ability of the contract structures proposed to be subject to a Market Making Obligation in the future?

It is challenging to comment in detail given the lack of clarity on when the MMO may be triggered and who will be defined as an obligated party, noting these elements are under development outside the IWG. As such, our comments below should be read in the context of currently-available information.

The Regional Reference PPA:

- An obligated market maker posting two-way prices on a contract whose volume is determined by an unobserved index is being asked to quote a spread on an unquantified base. Until the Index has a published history, this challenge will remain.
- MMO participant thresholds for bulk energy services are not yet clear. For a wind or solar Regional Reference PPA, the natural sellers are variable renewable generators, which may be stand-alone assets with limited trading functions who are not well-placed to play a market-making role.

The Dynamic ToD Block Spread Swap:

- The daily block determination means the instrument's exposure changes daily in a way that is forecast-dependent. Quoting a two-way price on a quarterly or annual strip requires a view on the distribution of future block configurations, which is complex, particularly in the early stages when indices are being developed and limited or no index history is available.

The \$600 cap:

- It is a variant of an instrument already market-made under the existing market liquidity obligation and proposed for initial MMO designation.
- Bid-offer spreads, minimum volumes and parcel sizes can be calibrated based on \$300 cap historical data.

Overarching Considerations:

In addition to the above, clarity is needed on how the AER intends to integrate these contracts into its regulatory mechanisms, including the MMO and also the DMO framework.

Question 14: Will the proposed contract structures, in conjunction with other risk management contracts such as flat swaps, evening peak swaps or caps, be effective for buyers (e.g. retailers, large loads) to manage financial risks?

The set is complete in principle – bulk energy provides volume at a regional technology shape; shaping provides intra-day spread coverage; firming provides tail protection above \$600. Combined with existing baseload swap, cap and evening peak products, a buyer can construct a hedge against a wide variety of potential load shapes.

7. Other considerations

7.1 Design questions that remain open

Based on the consultation paper and the draft product sheets, we consider the following questions to be unresolved.

Bulk energy

- The mechanism for managing Reference Fleet change over the contract term, including entry and exit rules, treatment of expansions and hybrid facilities, and whether any limitations would apply to the rate at which the fleet can change
- Whether the negative price provision is a volume knock-out or a price floor, and its interval basis.
- Whether the \$600 Floating Price cap is a hard reference to the firming strike (or APC) or a fixed dollar amount.

- Index administration, publication timing, correction and restatement policy, and benchmark governance.
- Treatment of offshore wind

Shaping

- The precise definition of Residual Demand and its stability as price-responsive resources become visible and scheduled.
- The block determination algorithm, including tie-breaking and any maximum total contracted duration per day.
- Fallback arrangements where the forecast is not published, is late, or is materially in error.
- Treatment of AEMO methodology changes over the contract term.
- Reconciliation of the 09:05–09:00 shaping day with spot settlement and weekly contract settlement.

Firming

- Clarification of the definition of firming
- What happens to the strike if the APC changes.
- The relationship between the cap, the CPT and the strategic reserve.

Common

- A standard FM definition and the design of any pooled FM risk management mechanism.
- Minimum parcel size for each contract.
- Exchange listing, clearing and margining treatment for each contract.

7.2 What else is needed to support this work

Market price settings review

Review timing:

The Panel recommended that the Reliability Panel provide a long-term outlook on the form of the market price settings as an enduring responsibility, and that a review of MPC, MPF and CPT be undertaken concurrently with the contract co-design process, because changes to these will impact expected revenue and risk allocation and therefore prices in derivative markets.³² This task has been handed over to the AEMC, which will report to Energy Ministers by the end of 2027, which is getting close to the intended date of the first ESEM tender.

Considerations on review objectives:

- **Revenue adequacy for firming services.** The Panel identified that the MPC, combined with the 8-hour duration implied by the CPT, may produce revenue insufficiency in a world where a firming generator's output is concentrated in a single season or even a single week. In addition, as noted above, the firming product as-defined is poorly suited to support investment in firming and storage technologies beyond 8 hour duration. This points to the importance of the strategic reserve, special purpose procurements or some other complementary mechanism to enable investments of this kind where they are needed.

³²NEM Review Panel, [Final Report](#), Recommendation 5.

- **Potential structural changes (if pursued) need to be landed quickly.** The Panel canvassed a stepped market price cap and an inframarginal administered price cap as hypothetical forms that future price settings could take. Any changes along these lines – i.e. to the structure of price settings rather than just the settings themselves – must be landed quickly as they have material implications for the finalized design of the ESEM products.³³
- **Long-term visibility for contract valuation.** ESEM contracts will settle in the 2040s. The current RSSR cycle sets values four years ahead. Without a long-term qualitative outlook, neither the ESEMA nor market participants can value long-dated contracts with confidence. The Reliability Panel has indicated it supports providing qualitative forward guidance on the form of the settings.³⁴
- **Stability for the \$600 anchor.** Three of the design parameters in this package reference \$600. The market needs to know whether that number is stable, and if not, how contracts should respond.

Reference Production and Residual Demand Indices

Reference Production Indices by region and technology as well as Residual Demand indices should be calculated and published on a live basis, from as early as practicable — ideally well ahead of the first tender. Once the methodologies are finalized, historical index values should be calculated and made available to support efficient risk analysis and pricing decisions.

Market Making Obligation transition

The MMO will apply initially to caps for firming and baseload swaps for combined bulk energy and shaping, before transitioning to contracts defined by the co-design process and designated by the AER.³⁵ There is therefore a period in which the ESEM procures one set of contracts while the MMO obliges market making in a different set. That is manageable, but it underscores the point above: the sooner the new indices are observable, the sooner the AER can form a view on whether the new contracts meet its liquidity criteria, and the shorter the period of divergence.

7.3 Could these contracts support demand growth from data centres?

According to the 2026 ESOO, data centres are the fastest growing component of NEM demand³⁶, and they are also, in principle, exceptionally well-suited counterparties for these products. The main players have strong balance sheets, corporate decarbonisation commitments that create demand for zero-emissions bulk energy, and load profiles that are often flat and predictable relative to a retail book. Several have shown a willingness to contract over tenors far longer than a typical retailer will accept, which is precisely the mismatch the ESEM exists to bridge.

More specifically:

- A Regional Reference PPA gives a large load a diversified regional renewable shape rather than exposure to a single project's performance — a better match to a continuous load than a run-of-plant PPA, and one that avoids the due diligence burden of assessing an individual asset.

³³NEM Review Panel, [Supplementary Materials](#), Section 2.2, 'Hypothetical models'.

³⁴NEM Review Panel, [Supplementary Materials](#), Section 2.3 (Reliability Panel letter to the Expert Panel, 29 October 2025).

³⁵DCCEE, [Regulatory Reforms Consultation Paper](#), Section 3.1.

³⁶ AEMO, [2026-electricity-statement-of-opportunities.pdf](#)

- The combination of bulk energy, shaping and firming allows a large load to construct a near-continuous hedge, which is what a 24/7 load actually needs (longer duration firming notwithstanding).
- Fungibility means a large load whose demand forecast changes — a real risk for data centre developments — can adjust its position over time if needed.

This being said, data centre additionality frameworks currently under development propose to use Renewable Electricity Guarantee of Origin (REGO) certificates to demonstrate compliance, so interactions between ESEM contracts and REGOs will need to be carefully navigated.

7.4 What do these contracts mean for existing assets?

The ESEM is confined to new investment: projects must represent new capacity, expansions, or end-of-life refurbishments, and cannot already be identified as committed or existing.

That eligibility restriction applies to the *mechanism*, not to the *contracts*. Once the contract forms exist, are documented under ISDA arrangements, and are traded on exchange or over-the-counter platforms, any participant can use them.

We note in particular:

- **Existing variable renewable generators could use a Regional Reference PPA to manage merchant exposure.** A large volume of operating wind and solar capacity in the NEM is approaching the end of its original PPA or is already partly merchant. For those assets, a liquid Regional Reference PPA market would be a genuinely new risk management tool: it offers a standardised, tradable way to hedge renewable revenue without the bespoke negotiation, counterparty due diligence and credit assessment a project PPA requires.
- **Existing storage could use the shaping product.** Operating batteries currently hedge through bespoke virtual tolling agreements or run merchant. A standardised, exchange-traded spread product would allow them to hedge a defined portion of spread exposure while retaining operational freedom and FCAS optionality. The caveat is the basis risk between the dynamically determined blocks and the asset's own optimization and pre-existing commitments.
- **Existing thermal and hydro generators are natural sellers of \$600 caps.** This is simply an extension of what they do today with \$300 caps. The move to a higher strike is favourable to them, since they retain merchant revenue in a band they currently forgo.

To conclude, the CEC commends the scale and pace of work completed by the IWG, while noting the open topics and activities still ahead to complete the task. The CEC welcomes further engagement on the matters raised as the IWG progresses this work. Further queries can be directed to Martin Kennedy at the following email address: mkennedy@cleanenergycouncil.org.au.

Kind regards,

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