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South Australian Government
Lodged online via [submission portal](#)

Dear [REDACTED]

Response to South Australian Government's consultation paper on the Firm Reliability Mechanism

The Clean Energy Investor Group (CEIG) welcomes the opportunity to provide feedback on the South Australian Government's consultation paper on the Firm Energy Reliability Mechanism (FERM) published in November 2024.

CEIG represents domestic and global renewable energy developers and investors, with more than 16GW of installed renewable energy capacity across more than 76 power stations and a combined portfolio value of around \$38 billion. CEIG members' project pipeline is estimated to be more than 46GW across Australia. CEIG strongly advocates for an efficient transition to a clean energy future on behalf of the investors who will provide the low-cost capital required for this transition.

Key Points

- **CEIG supports the establishment of a FERM that provides investment signals for long-duration capacity to back up wind and solar generation.**
- **However, CEIG advocates for prioritising clean firming solutions over gas-fuelled generators** to maintain SA's renewable energy leadership and accelerate grid decarbonisation.
- CEIG recommends that **emissions intensity be integrated into the consideration of all tenders.** Incentivising zero-emission both medium and long duration energy storage would best align with SA's and Australia's energy and climate objectives.

- **Supporting the development of new fossil fuel resources sends mixed signals to the market, undermining investor confidence** in the State's commitment to emissions reduction, and **introduces regulatory risks for private investors.**

Tender eligibility

- **CEIG questions the inclusion of gas generators in the FERM**, noting that their business model relies on peak pricing, making capacity payments unnecessary to keep them operational.
- **CEIG recommends incorporating additionality in identifying 'at-risk' periods** to avoid granting windfall payments to plants that would be available regardless, such as gas peaker plants.
- Should the FERM proceed with its proposed eligibility criteria, **CEIG recommends that gas eligibility be regularly reviewed through the annual FERA, with the aim of removing gas plants' eligibility as soon as possible.**
- **CEIG supports 15-year contracts for new capacity** but recommends **excluding new and existing gas plants from 15-year contracts to maintain flexibility** and suggests **existing gas plants only be eligible only for 1-year contracts agreed to 4 years in advance.**
- The ISP forecasts that **new gas capacity will not be needed until 2033/34**, with gas primarily serving as a strategic reserve for power system reliability and security.

CEIG seeks clarification on the restriction of the FERM to 8-hour+ technologies, noting that **excluding 4-hour+ technologies will effectively favour gas.**

CEIG highlights that **batteries have significantly lower short-run marginal costs compared to gas turbines**, making them more cost-effective and likely to be utilised.

Incentivising medium duration energy storage

- CEIG recommends that the **Government shift its focus to supporting clean technologies capable of providing medium duration energy storage.**
- Reports commissioned by CEIG **recommend collaborating with the Federal Government to develop markets, funding R&D for medium duration storage, improving storage assessment processes, and addressing policies that may hinder investment in storage by incentivising thermal assets or gas and hydrogen firming.**
- The FERM should **adopt an evidence-based approach to set duration requirements.**
- **CEIG encourages SA to use AEMO's ESOO modelling** to evaluate the relative reliability contributions of various combinations of wind, solar, and storage compared to gas generators.

LOR 2/3 performance requirement

- CEIG warns against **potential unintended consequences of applying performance obligations to storage assets during LOR events.**

- As an alternative, CEIG proposes that **storage assets be required to provide 50% of their contracted capacity for LOR3 events that are forecast more than 24 hours in advance.**

Future market design

- CEIG shares the Government's view that **the current energy-only market may not provide sufficient investment signals for long duration capacity to remain in or enter the market.**
- CEIG recommends that the FERM design **be adaptable to future market design changes and urges the Government to clarify how the FERM will align with this workstream.**

GENERAL COMMENTS

CEIG commends the South Australian (SA) Government on its leadership in renewable energy, including its ambitious target of achieving 100 percent net renewables by 2027. We also congratulate the State for being the first to sign a final Renewable Energy Transformation Agreement (RETA) and commend the Government for delivering on its commitment under the RETA to establish its own grid reliability mechanism and benchmark.

We strongly support efforts to provide the necessary investment signals for firming capacity to ensure sufficient back-up for wind and solar generation as the State transitions toward its renewable energy goals. CEIG also endorses the development of a Firm Energy Target (FET) to provide a clear, long-term plan for South Australia's energy transition, increasing investor confidence and aligning with renewable energy goals.

However, while South Australia to date has been a trailblazer in renewable energy, making gas generators eligible to bid in the FERM risks undermining this progress. To accelerate decarbonisation and maintain the State's leadership, it is crucial to prioritise incentives for clean firming solutions. Emissions considerations must be at central to the mechanism's design, and new gas plants should not be eligible for support to avoid the risk of locking in high emissions for decades.

Prolonging the role of existing gas-fuelled generators or incentivising new gas plants to be built would not only detract from the State's renewable energy achievements but also severely undermine investor confidence. Such actions send mixed signals to the market, discouraging investment in the clean energy solutions needed to drive the transition forward.

The Government must also clearly define the mechanism's intended duration and outline how it aligns with broader national market design reforms. This clarity will ensure alignment between state and national policies and provide long-term investment certainty.

A word of caution on the OEMF

CEIG notes that the South Australian Parliament has recently passed the Orderly Exit Management Framework (OEMF) Bill. While we recognise the intent behind this legislation, we urge caution in its application.

Postponing the closure of thermal generators would jeopardise power affordability, reliability, and security, as older thermal facilities are both unreliable and costly¹. Certainty around retirement dates is crucial to maintaining investor confidence and reducing investment risks. Without clear timelines, investor sentiment could be severely impacted, creating significant downside risks – particularly at a time when advancing projects from pipeline to commitment is already challenging.

For these reasons, CEIG does not support the OEMF in its current design.

TENDER ELIGIBILITY

CEIG understand that eligible technologies under the FERM would include those with a capacity of 30 MW or more and capacity of providing at least 8 continuous hours of long-duration firm output. Under the FERM, generators of long-duration firm capacity will tender annually for contracts that underwrite a portion of their revenue. We welcome the explicit exclusion of coal generators from participating in the FERM.

We note that the tender eligibility criteria may evolve over time to address changing system needs and that other factors such as emissions intensity could be considered for individual tenders.

Clear guidance is needed on what the FERM will prioritise when evaluating tenders – whether it will focus solely on least cost or also consider emissions intensity, in line with South Australia’s commitment to the National Emissions Objective (NEO).

CEIG urges the consideration of emissions intensity in all tenders. This should be a key consideration for South Australia to ensure the mechanism supports its emissions reduction targets, including reducing greenhouse gas emissions by over 50 percent from 2005 levels by 2030 and achieving net zero emissions by 2050.

Re-assess eligibility of gas

CEIG notes that the FERM currently includes existing and new gas generators, allowing them to bid for underwriting agreements.

While we acknowledge the importance of ensuring adequate firming capacity, particularly during periods of high renewable energy generation, it is critical to prioritise clean energy solutions to accelerate grid decarbonisation. Incentivising zero emission battery energy storage, rather than enabling the development of new gas plants, would best align with South Australia’s energy and climate objectives.

¹ CEIG (Feb-24) [Response to the NSW and Commonwealth Government’s consultation paper on Orderly Exit Management Framework](#)

As highlighted in the consultation paper, the FERM must account for its impacts on consumers, businesses, and investor confidence, particularly as other State initiatives aim to grow new industries reliant on affordable and reliable renewable energy. Supporting the development of new fossil fuel resources sends mixed signals to the market, undermining investor confidence in the State's commitment to emissions reduction.

Including gas in the FERM also introduces regulatory risks to private investors and threatens the achievement of South Australia's climate targets. Notably, the Capacity Investment Scheme (CIS) has explicitly excluded fossil fuel technologies, in recognition of these risks.

CEIG also questions the justification for including existing gas generators in the FERM. CEIG anticipates that gas generators will likely remain available during periods of high demand in the National Electricity Market (NEM), as their business model is built around capitalising on peak pricing. Consequently, capacity payments are unlikely to be necessary to prevent these plants from being 'mothballed,' as the market already provides sufficient incentives for peaking plants to remain operational.

CEIG therefore recommends incorporating additionality when identifying 'at-risk' periods, to avoid granting 'windfall' payments to plants that would have been available regardless (e.g., gas peaker plants designed to operate during peak times).

If gas is considered eligible

Should the FERM proceed with including gas in its eligibility criteria, we recommend limiting eligibility to increased generation from existing plants, excluding new gas plants from the mechanism.

The eligibility for existing gas plants should remain flexible subject to regular reviews through the proposed annual Firm Energy Requirements Assessment (FERA), and adjustments made to the mechanism accordingly. This flexibility is essential to adapt to changes such as shifting peak demand patterns (e.g., from summer to winter peaks as solar penetration increases) and uncertainties around future demand growth, particularly from initiatives like the South Australian Hydrogen and Renewable Energy Act 2023. Avoiding overcommitment now will help ensure the mechanism remains responsive to South Australia's evolving energy landscape.

While CEIG supports the proposal for 15-year contracts for new capacity, we are concerned that awarding long term contracts to new gas generators creates limited flexibility for reassessing their necessity, potentially locking the system into outdated technologies. To maintain adaptability, CEIG suggests excluding new and existing gas plants from 15-year contracts and limiting existing gas plants' eligibility to 1-year contracts, agreed to 4 years in advance. This would ensure the mechanism remains responsive to South Australia's decarbonisation goals and evolving market needs and allow the FERM to align with annual FERA while avoiding long-term commitments to fossil fuel

technologies.

To ensure the FERM continues to support South Australia's decarbonisation goals, CEIG emphasises the importance of prioritising zero emissions technologies such as battery energy storage in tenders, regardless of whether the eligibility criteria includes gas. Keeping the mechanism adaptable and learning from each tender cycle will be key to achieving the State's energy transition objectives.

Nevertheless, should the mechanism progress with the inclusion of gas, CEIG suggests prioritising zero emissions technologies such as battery energy storage.

Role of gas as outlined in the ISP

CEIG acknowledges that gas generation will play a role in the transition to a decarbonised electricity grid. We note that the Australian Energy Market Operator's (AEMO) 2024 Integrated System Plan (ISP) identifies a need for 15 GW of fast response gas capacity under the Step Change scenario, an increase from the 11 GW currently in the system².

However, the ISP forecasts that significant new gas capacity will not be required until 2033/34. In this scenario, gas is expected to serve primarily as a strategic reserve to support power system reliability and security. AEMO also estimates that by FY2034/35, long duration firm capacity will account for about 14 percent of installed capacity in South Australia, contributing to 4 percent of total annual energy generation.

CEIG also notes that AEMO is exploring deep storage as an alternative and is working on refining its gas modelling in the ISP, which is likely to reduce to need for new gas peaking capacity³.

Consider a 4-hour+ duration requirement

CEIG seeks clarification on the rationale for restricting FERM to only 8-hour+ technologies, and we request market modelling to support this decision.

This approach, unlike that of NSW and the CIS storage tenders, limits the pool of eligible technologies under the mechanism. By excluding 4-hour+ technologies that would significantly benefit from the FERM by improving their commercial market viability, South Australia increases the likelihood that gas-fired generation, rather than battery energy storage systems (BESS), will be successful. This could lock in emissions, jeopardising not only South Australia's climate targets but also Australia's ability to meet the 1.5°C goal.

A more nuanced approach is warranted, particularly if new gas capacity is being considered eligible. Since FERM already recognises the role of CIS storage as a tool, it is unclear why a lower minimum duration has not been used as a threshold. This adjustment would ensure batteries remain competitive with new gas, reduce the risk of locking in gas

² AEMO (Jun-24) [2024 Integrated System Plan \(ISP\)](#)

³ CEIG (Nov-24) [Response to AEMC's draft rule determination on Better integrating gas and community sentiment into the ISP](#)

infrastructure, and better align with the broader objective of achieving a low-emission, renewable energy future.

For instance, batteries and pumped hydro primarily charge during peak solar hours (9 a.m. to 3 p.m.), which is perfectly suited to a 6-hour battery. An 8-hour battery, by contrast, often cannot fully charge during this window. Despite its shorter charging duration, a 6-hour battery can distribute its discharge over an equally extended period, such as overnight, similar to an 8-hour battery.

It is also worth highlighting the difference in short-run marginal costs. The cost of discharging a battery is only slightly higher than its charging cost, while the short-run marginal cost of operating a gas turbine is approximately \$100-\$200/MWh, depending on fuel costs. This cost efficiency makes batteries far more likely to be utilised daily, compared to gas turbines that are typically reserved for high-price spike days. Consequently, batteries are significantly more effective at reducing prices than gas turbines.

Adopt an evidence-based approach to duration requirements

CEIG recommends that the FERM adopt a more nuanced, transparent, and evidence-based approach to setting duration requirements, rather than applying on a static requirement enshrined in legislation – particularly for tenders that will result in 15-year contracts.

A more dynamic method, such as the approach used by the California Public Utilities Commission, could be considered. This involves annually assessing the reliability contribution of different storage types relative to a natural gas generator using de-rating factors, which are published in an “Effective Load Carrying Capacity Report”⁴. This method enables a fair comparison of storage durations and aligns decisions with system needs.

By applying a similar approach, the South Australian Government could use an 8-hour battery as a baseline and publish annual de-rating factors for storage systems with durations from 2 hours+. This would allow for pure cost comparisons and ensure outcomes are driven by cost-effectiveness.

We acknowledge that this approach would likely require additional work, however it would result in more accurate and market-appropriate capacity being developed, avoiding unnecessary overspending. Furthermore, it would provide flexibility for future tender rounds to incorporate longer-duration systems, such as 10-hour batteries, if system needs evolve.

An alternative approach for South Australia could involve leveraging AEMO's Electricity

⁴ California Public Utilities Commission (Jan-23) [Incremental ELCC Study for Mid-Term Reliability Procurement](#)

Statement of Opportunities (ESOO) modelling to assess the relative contribution to reliability of different combinations of wind, solar, and storage compared to that of a gas generator.

INCENTIVISING BOTH MEDIUM AND LONG DURATION STORAGE

CEIG recommends that the Government shift its focus to supporting clean technologies capable of providing both medium and long duration energy storage.

Earlier this year, CEIG commissioned two reports from Nexa Advisory and Baringa Partners: *Energy Storage Financeability in Australia*⁵, and *Investing in Energy Storage: Assessment of the 'Bankability' of Storage in the NEM*⁶. These reports provide a comprehensive review of the Australian energy storage market, highlighting key challenges and opportunities within the sector, along with actionable recommendations to address the barriers faced by investors and developers.

The reports led to several key findings, including:

- Australia will need a significant growth in energy storage over the next decade to ensure a smooth transition.
- The growth of Australia's energy storage market has been reliant on government support.
- New services and markets are urgently needed to facilitate investment.
- Medium duration energy storage is critical to achieving the transition.
- Market certainty is key.
- The power purchase agreement (PPA) market needs more competition beyond traditional players.
- Research and development in energy storage is critical for the future.

Relevant recommendations from these reports for South Australia include:

- Collaborating with the Federal Government to develop markets and contracts to facilitate investment.
- Prioritising and funding research and development into battery energy storage technologies.
- Ensuring fit-for-purpose approvals for storage by providing specific guidance and standards from the planning department to reduce complexity and costs.
- Working with the Federal Government and industry to support education and outreach to raise awareness and understanding of storage within the finance sector.

Baringa's report emphasised that additional measures will be needed to drive investment in the storage required to decarbonise the NEM, particularly medium duration storage⁷. They also found that government mechanisms can likewise hinder investment in storage. In particular, policies which extend the life of thermal assets, or incentivise other providers

⁵ CEIG & Nexa Advisory (Mar-24) [Energy Storage Financeability in Australia](#)

⁶ CEIG & Baringa (Dec-23) [Investing in storage. Assessment of the 'bankability' of storage in the NEM](#)

⁷ CEIG & Baringa (Dec-23) [Investing in storage. Assessment of the 'bankability' of storage in the NEM](#)

of firming in the market (such as gas and hydrogen) may suppress market price signals that would otherwise have incentivised investment in storage.

LOR 2/3 PERFORMANCE REQUIREMENT

CEIG understands that the FERM proposes using LOR 2/3 event performance as the primary contract performance obligation. Under this framework, when AEMO issues a forecast LOR 2 or 3 notice, long duration firm capacity providers holding a FERM contract must demonstrate they have submitted market bids for their capacity within 30 minutes for the duration of the forecast LOR window.

CEIG's analysis of similar requirements proposed under the CIS highlights potential unintended consequences of applying performance obligations to storage assets during LOR events⁸:

- Long duration storage facilities require more time to charge than short duration facilities. If insufficient notice is given before an LOR3 event, these facilities may have limited opportunity to charge and should therefore not be penalised under LOR3 performance criteria due to inadequate preparation time.
- Batteries charging quickly to meet their contractual obligations immediately before an LOR3 event could inadvertently escalate a LOR2 event into an LOR3 event. To address this, exemptions should be granted to storage facilities that refrain from performance during LOR3 events when doing so would exacerbate the situation by charging immediately prior to it.

As an alternative, CEIG proposes that storage assets be required to provide 50 percent of their contracted capacity for LOR3 events that are forecast more than 24 hours in advance.

In addition:

- If a storage asset with a FERM contract has more than 50 percent charge when an LOR3 event is declared with less than 24-hour notice of it being forecast, then it is required to have at least 50% charge at the start of the LOR3 event.
- If a storage asset with a FERM contract has less than 50 percent charge when an LOR3 event is declared with less than 24-hour notice of it being forecast, then it is required to retain at least its current state of charge when the LOR3 event begins.

FUTURE MARKET DESIGN

CEIG shares the Government's view that the current energy-only market may not provide sufficient investment signals for long duration capacity to remain in or enter the market.

We appreciate the Government's efforts to design an efficient market signal that addresses long duration capacity needs while balancing system resilience, consumer costs, and carbon emissions.

⁸ CEIG (Mar-24) [Response to Commonwealth Government's Capacity Investment Scheme – Design Implementation paper](#)

Generators and long duration firm energy providers both face exposure to periods of low and negative electricity prices. This issue highlights the broader “missing money” problem, as outlined in CEIG and Baringa’s report, where market revenues are insufficient for generators and long duration storage to recover their costs⁹.

In light of this, CEIG recommends that the design of South Australia’s FERM be resilient to potential changes from ongoing and future market design processes, including the Commonwealth Government’s recently initiated Future Market Design workstream¹⁰.

We also encourage the South Australian Government to clarify how it envisions the FERM interacting with this national work to ensure alignment.

Early next year, CEIG will be releasing a Discussion Paper, “*Role of market design in energy transition*”, authored by Castalia. The Paper suggests that achieving a 100%+ renewable grid will require targeted reforms to provide investors with the confidence needed to unlock capital for Australia’s energy transition. A follow-up Solutions Paper, “*Pathways to a Sustainable and Resilient NEM*”, will incorporate feedback from the discussion paper consultation to propose market design solutions that strengthen investment signals.

CEIG looks forward to working collaboratively with the South Australian Government to shape a market framework that aligns with its decarbonisation objectives and delivers benefits to consumers.

CEIG thanks the South Australian Government for the opportunity to provide feedback on its proposed Firm Energy Reliability Mechanism and looks forward to continued engagement on those issues. Our Head of Policy and Advocacy can be contacted at [REDACTED] if you would like to further discuss any elements of this submission.

Yours sincerely,

[REDACTED]

Clean Energy Investor Group Ltd

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⁹ CEIG & Baringa (Dec-23) [Investing in storage. Assessment of the ‘bankability’ of storage in the NEM](#)

¹⁰ DCCEE (Nov-24) [National Electricity Market wholesale market settings review](#)