Justice and Equity Centre

Efficient provision of inertia directions paper

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About the Justice and Equity Centre

The Justice and Equity Centre is a leading, independent law and policy centre. Established in 1982 as the Public Interest Advocacy Centre (PIAC), we work with people and communities who are marginalised and facing disadvantage.

The Centre tackles injustice and inequality through:

- legal advice and representation, specialising in test cases and strategic casework;
- research, analysis and policy development; and
- advocacy for systems change to deliver social justice.

Energy and Water Justice

Our Energy and Water Justice work improves regulation and policy so all people can access the sustainable, dependable and affordable energy and water they need. We ensure consumer protections improve equity and limit disadvantage and support communities to play a meaningful role in decision-making. We help to accelerate a transition away from fossil fuels that also improves outcomes for people. We work collaboratively with community and consumer groups across the country, and our work receives input from a community-based reference group whose members include:

- Affiliated Residential Park Residents Association NSW;
- Anglicare;
- Combined Pensioners and Superannuants Association of NSW;
- Energy and Water Ombudsman NSW;
- Ethnic Communities Council NSW;
- Financial Counsellors Association of NSW;
- NSW Council of Social Service;
- Physical Disability Council of NSW;
- St Vincent de Paul Society of NSW;
- Salvation Army;
- Tenants Union NSW; and
- The Sydney Alliance.

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The Justice and Equity Centre office is located on the land of the Gadigal of the Eora Nation.

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1. Introduction

The Justice and Equity Centre (JEC) welcomes the opportunity to respond to the Australian Energy Market Commission's (AEMCs) Efficient provision of inertia directions paper (the Paper).

We support the intent of the rule change. The Paper addresses reforms which would represent a marked improvement on the current state in which there is no incentive for the provision of inertia above the minimum level needed for the secure operation of the system. Meeting additional inertia demand could help facilitate the transition to a net zero energy system and reduce dispatch costs through mitigating the need for fast frequency response and enabling cheaper generation or interconnector flows.

We support exploring the potential benefits of meeting additional inertia demand, but recommend this process also consider opportunities to improve the efficient procurement of minimum levels of inertia as well. This could be achieved through shifting away from a framework that assigns responsibility for inertia procurement to a single party, limiting opportunities for competitive provision.

We welcome the Paper's focus on both the supply and demand side for inertia. Historically, these discussions have tended to neglect load and demand-side machines, so we are pleased with the inclusion of these considerations in the Paper. Likewise, we welcome the acknowledgement that the need for inertia may not increase indefinitely and could conceivably be lower again when there are fewer large mechanical generating units in the energy system.

As such, economic analysis should start from the premise that the primary beneficiaries of inertia services (at least in the short to medium term) are the participants whose presence imposes a need for inertia to be provided.

2. Credible contingencies

Credible contingencies are likely to be increasingly weather-driven and location-dependent.

At present, synchronous generators are both the main source of inertia and the main driver of contingency events in the NEM which require minimum inertia to be procured. However, contingency events will increasingly be dictated by other factors as these generators retire. Both demand for and supply of inertia will shift as a result.

We expect contingencies to be increasingly weather-driven and location-dependent as the generation mix shifts towards renewables. These characteristics should be included in future assessments to gain a clearer view of credible contingency sizes and their effect on the supply and demand of inertia. Without these factors, it is difficult to assess future credible contingencies with any confidence. As such, the Commission should carefully scrutinise the findings of the economic analysis on this matter.

Larger credible contingency sizes could arise in the future as renewable energy zones connect to the grid. However, inverter-based generators are likely to have a less pronounced impact on inertia given their much higher ride-through capability and tolerance to high rates of change of frequency. As such, it is appropriate that minimum inertia levels remain linked to the largest credible single-point failure in the system.

Future credible contingency size will depend on how new projects are commissioned and where they connect to the grid. Our tentative expection is that the retirement of synchronous generators will decrease minimum inertia requirements but increase demand for additional inertia services in order to minimise the costs of frequency management.

3. Meeting future interia needs

The Commission should not assume synchronous condensers (or TNSPs) will provide most of the NEM's future inertia needs.

Under the current framework, TNSPs are responsible for maintaining minimum inertia levels. They do so through investing in synchronous condensers, negotiating long-term contracts with generators and integrated resource providers, or using inertia support activities (such as contracting fast frequency response) to reduce their binding requirements.

Improvements to the structured procurement framework will enable TNSPs to meet minimum inertia demand in real-time. These are welcome improvements but we do not consider TNSPs (or for that matter any one party) to be the most efficient procurer of inertia.

TNSPs frame the 'inertia problem' largely in terms of a shortage of synchronous condensers. This is no surprise given the incentive for regulated businesses to grow their asset base. Considering TNSPs act as defacto monopoly providers of minimum inertia services, this framework is unlikely to produce the best outcomes for consumers. Put simply, absent any additional direction or requirements, TNSPs are likely to respond to inertia needs with a single (synchronous condenser) solution which may not be the most efficient in many circumstances.

We strongly recommend that procurement of minimum inertia not be mediated through a single party – whether TNSPs or otherwise. A more contestible framework for inertia provision would help promote a more balanced assessment of available options and ensure minimum inertia demand is genuinely met at least cost.

4. Integration of grid-forming inverters

Clear investment signals are needed to encourage and improve the Integration of grid-forming inverters

Grid-forming inverters hold significant potential as a future low-cost source of inertia. As the Paper highlights,

> A notable advantage of these inverters is their flexibility, as they can provide synthetic inertia while charging, discharging, or idle. This capability enables them to co-optimise with other services, such as FFR and energy storage, further enhancing their value in the evolving energy landscape.

The greatest obstacle to the uptake of grid-forming inverters is the absence of economic signals to reward providers of the services these assets can (or could) provide. Putting appropriate signals in place is necessary to ensure the owners/operators of these assets have opportunity to integrate relevant capabilities at the design phase rather than doing so as part of a more expensive retrofit.

Providers of synthetic inertia (or other ancillary services) need to have confidence that appropriate markets and revenue opportunities exist. Without appropriate frameworks and incentives, these services are likely to remain undervalued and underprovisioned.

We note the concern with 'maintaining sufficient headroom or footroom for effective inertial responses' but we do not regard the likelihood of these risks as equal. We consider it more likely for operational issues to arise due to insufficient headroom (i.e. a battery lacking spare capacity to take on additional charge) than due to insufficient footroom (i.e. a battery lacking sufficient charge to discharge when called upon).

We expect batteries will generally charge to the fullest extent possible when it is advantageous to do so and maintain some charge in reserve as a contingency should wholesale prices spike. We consider it less likely for operational issues due to insufficient footroom to arise because the consequences of spilling some solar (or failing to capitalise on low wholesale prices) are less material than the opportunity cost of failing to feed into the grid when spot prices are high.

Enhancing capacity to manage state of charge across a fleet of providers (rather than managing individual assets) represents a significant opportunity to co-optimise grid-forming inverters. Requiring individual batteries to provide a fixed level or proportion of their capacity in order to participate in inertia markets would be inefficient. State of charge of batteries should be considered in aggregate with a focus on total (rather than individual) capacity.

We encourage AEMO to take a more active role in developing this capacity most efficiently.

5. Provision of minimum inertia

Long-term procurement models should allow for the contestable provision of minimum inertia as well as additional inertia.

We support using long-term procurement models to meet minimum inertia levels due to the high costs associated with undersupply. We agree with the conclusion that 'operational procurement is not currently suitable as the primary mechanism for meeting minimum inertia levels'. However, we also note the finding that 'over-procuring inertia through long-term contracting imposes costs on all consumers'.

We do not consider TNSPs (or any single party) an efficient procurer of inertia. We recommend gradually reducing the proportion of minimum inertia levels that TNSPs are required to provide and shifting this service to methods of contestable provision. This would ensure all procurers face a strong incentive to maximise efficiency and encourage greater diversity across the supply portfolio.

It is inefficient, uncompetitive, and not in the interest of consumers to maintain minimum inertia procurement with TNSPs. The incentive for TNSPs to grow their RAB gives them little reason to procure inertia through more efficient non-network solutions. While there should be no TNSP role in acting as the sole procurer of inertia, TNSPs, in their ring-fenced capacity, should be able to compete to provide inertia services as they may be the most efficient provider in some cases.

We welcome upcoming changes as part of the ISF rule to keep costs related to the provision of system security services as low as practicable for consumers. However we are concerned these will not deliver on their intent. The incentive for TNSPs to grow their RAB, inherent capex bias, and information assymetries between them and the AER are likely to undermine efficient procurement. We consider this will remain the case as long as TNSPs remain the sole party charged with supplying system security services.

6. Drawing on the System Restart Ancillary Services framework

The System Restart Ancillary Services (SRAS) framework should inform the procurement of minimum levels of inertia.

We recommend the Commission take into account the provision of SRAS as part of efforts to efficiently procure minimum levels of inertia. The SRAS model merits consideration and could prove instructive on matters including:

- Effective governance that leverages independent decision making and oversight of procurement levels and services
- Efficient market outcomes that provide flexibility in procurement to seek out the lowest cost services while maintaining an appropriate level of transparency and accountability
- Efficient cost recovery that ensures charges paid by participants broadly reflect the benefits provided by that service

The SRAS framework may provide insights into how to organise the long-term procurement of a service in which the costs of undersupply are high and in which there is a substantial risk of participants using their market power to increase prices.

The SRAS framework is designed such that participants face two sets of incentives in SRAS markets.

- The prospect of earning revenues may encourage providers to offer SRAS and to invest in SRAS facilities. This incentive is signalled by the potential prices that SRAS providers can charge for their services in different sub-networks.
- Generators bear half of the total cost of SRAS through the SRAS charges they face as participants. This means that a portion of the total cost of providing SRAS is recovered from the same parties that created that cost in the first place.

This model may suit the procurement of minimum levels of inertia and should be considered as an alternative to TNSP-led procurement.

7. Continued engagement

The JEC welcome the opportunity to meet with the AEMC Ministers and other stakeholders to discuss these issues in more depth.