Energy Networks Australia System services rule changes

Response to AEMC

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Energy Networks Australia

Contents

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Key messages

- Energy Networks Australia supports reforms to the frameworks for delivery of system services in the NEM in the interests of electricity consumers.
- Some areas of the present rule change package require action in the short term, such as reforms to the system strength framework, while other aspects are better considered holistically in light of the ESB's post-2025 reform program.
- Energy Networks Australia recognise the challenges raised in many of the Rule changes as well as the desire to develop approaches to price and deliver system services. Many of these services are not valued discretely and have traditionally been delivered as a 'package' of services in the energy market by synchronous generators. Separately valuing these services should realise an overall benefit for consumers in the form of a more efficient balance of equipment and operation for secure and reliable power supply.
- Where it is not technically or economically feasible to create new markets to deliver system services, due to the technical complexity or locational nature of the services which limits the scope for effective competition, efficient arrangements should be put in place to plan, procure, value and fund the delivery of these services.
- System strength is a necessary pre-condition for meeting a range of transmission network performance standards and licence obligations, including proper operation of protection systems and quality of supply to customers. As such, it should be considered a network service.
- System strength is a locational requirement, not a global service. As such it should, in the main, be provided as a network service managed by the Jurisdictional Planner as the party accountable for shared transmission network service outcomes. Jurisdictional planners are well placed to coordinate system strength planning and procurement as they conduct joint planning with each other and with the distribution networks in their jurisdictions.
- The role of TNSPs is to provide a network capable of reliable and secure operation. AEMO's role is to reliably and securely operate the NEM.
- Energy Networks Australia supports the intent of TransGrid's proposed system strength rule changes that a more proactive and coordinated approach to system strength is required, and the desire to realise economies of scale for the benefit of consumers.
- The current approach where individual generator proponents must meet do no harm provisions and TNSPs can only procure to meet a shortfall of system strength —or inertia — once it is declared by AEMO creates inefficient investment in system strength services, increases the cost of generator connections and increases the cost and risk of operating the power system securely.
- Energy Networks Australia recommends an increased emphasis on medium to long term planning for system strength needs — to better provide holistic solutions at the least long-term cost to consumers.
- A key feature of the do no harm provision is the allocation of responsibility to ensure the system remains secure after the connection, which is paid for by the individual generator. An approach that allows TNSPs to provide a more holistic approach may be more efficient — with the network costs allocated appropriately.

- Energy Networks Australia supports locational signals for generators. This can be achieved in part through transparent information on where system strength will be supported on the power system. There may also be a case to keep aspects of the do no harm frameworks for generators who choose to locate in areas of low system strength at the far reaches of the network, and this should be further explored as part of an optimised coordinated approach.
- System strength is influenced by a number of complex and interlinked factors, including distribution networks. Any framework that the AEMC considers adopting should not be targeted to theoretical minimum levels or presume a high degree of accuracy in the models. The "minimum" requirements for inertia and system strength need to allow for growth, planned outages and contingency events. There may be a benefit when developing needed capability for system strength to also consider inertia requirements of the power system.
- An independent body, such as the Reliability Panel, should set the approach to system strength and the standard to ensure appropriate evaluation of risk and cost.
- AEMO would still have a role to the extent that any minimum system strength levels were breached to issue directions to manage the power system in a secure state.

1 Overview

Energy Networks Australia is the national industry body representing Australia's electricity transmission and distribution and gas distribution networks. Energy Networks Australia members provide more than 16 million electricity and gas connections to almost every home and business across Australia. This submission is on behalf of transmission members of Energy Networks Australia.

Energy Networks Australia provides this response to the AEMC combined consultation on system services rule changes. Energy Networks Australia has, as the AEMC expected, only commented on those aspects that are related to the work of Network Service Providers (NSPs) — primarily Transmission Network Service Providers (TNSPs).

The provision of a workable grid by TNSPs is a core role. This allows AEMO to effectively operate the NEM. As a result, Energy Networks Australia is concerned that any change to the market does not limit the ability of TNSPs to deliver on this role where TNSPs are often the key provider but — importantly — often the backstop to maintain the system.

In this paper Energy Networks Australia considers the range of the Rule changes — noting that Energy Networks Australia's focus is on the two proposed by TransGrid and Hydro Tasmania that deal directly with system strength. Energy Networks Australia considers that system strength needs to be considered separately from frequency management matters — including inertia. Energy Networks Australia notes, however, that there are areas where the provision of voltage support and inertia intersect, for example a synchronous condenser can be designed to support both voltage and inertia. Regardless, Energy Networks Australia proposes that the two services should still be treated separately.

Energy Networks Australia then puts the case for central TNSP involvement in the core provision of system strength in the grid. Energy Networks Australia considers that the relevant Jurisdictional Planner is the party that is best placed to be the primary planner and that TNSPs should be the primary procurers (within the AEMC Assessment framework) of these services — fault levels, voltage support and other power quality matters. TNSPS are best positioned to provide the localised planning of this service and to manage the interaction with other NSPs.

Energy Networks Australia considers that there is no agreed definition of the system strength service that enables commoditising the service in a de-centralised market. This is due to the sometimes adverse interactions between individual facilities providing services. It is difficult to reduce these interactions to simple metrics as the interactions can be complex.

TNSPs have an obligation under the existing Rules to examine the range of potential solutions and are thus best placed to ensure the least cost outcome. The efficiency of TNSP provision is also overseen by the AER — further ensuring a cost-effective delivery of these services to the benefit of consumers.

Energy Networks Australia has reflected key aspects of this paper into the template provided by the AEMC. Energy Networks Australia considers that the template is useful to frame ideas within the approach proposed by the AEMC, but it limits the exposition of the key points that Energy Networks Australia has included in this submission. The two documents should therefore be considered together as complementary documents rather than separate responses.

1.1 The post 2025 market reforms

Energy Networks Australia notes that the Energy Security Board's post 2025 market reforms are to be consulted on at the end of this month and deliberations on these rule changes will occur during the consultation process for the post 2025 design.

It is important that changes to the Rules do not foreclose options for the post 2025 Reforms and — importantly — do not make changes that will become redundant or inefficient in light of the later reforms. It is important that there be full consideration of the cost-benefits of making the changes.

1.2 The AEMC combined consultation

Energy Networks Australia accepts that the basis for the AEMC consultation on the Rule changes concurrently is because they all relate to services that are adjuncts to the direct provision of energy to the system but are essential to maintaining a functional power system.

At the start of the NEM, the key focus was on the provision of energy. Some ancillary services — like frequency control (FCAS), voltage support and system restart — were also recognised.

Synchronous machines provide other system services, the subject of this consultation, bundled with energy trading in the NEM spot market. As more inverter connected technology enters the NEM and displaces synchronous generation, the question of how system services are to be planned, procured and paid for is critical. Those services that were provided as an adjunct to spot market energy can no longer be relied upon to be included as a by-product of energy provision.

That is, the remaining services necessary for secure and reliable operation, only now require service specific arrangements, because the nature of connected plant has changed and will continue to transition to greater volumes of inverter connected technology.

On the one hand it can be argued that fully centralised homogenous planning and procurement arrangements may lead to a least cost outcome.   On the other hand, arrangements that are specific to individual services can be seen as a consequence of disaggregation into competitive and regulated sub-sectors, geographic service territories and individual commercial undertakings that are central to the concept of open access and competition central to the NEM. The challenge for a body such as the AEMC is how to balance the costs and benefits of centralised versus disaggregated arrangements for the services. The TransGrid proposal, in particular, calls for the AEMC to consider this balance.

The provision of frequency management service — including inertia, synthetic inertia and fast frequency response (FFR)[1] — should be considered separately from system strength.

1.2.1 Key aspects — system strength vs frequency management

In this section Energy Networks Australia expands on the differences between system strength and frequency management and then note the range of Rule changes included in this consultation.

1.2.1.1 *The meaning of the term system strength*

The term system strength is evolving but for the purpose of these rule changes and the AEMC consideration of the proposed rule changes, system strength can be defined as the ability of an electrical network to withstand perturbations in ***voltage***. These services include voltage management and fault level management.

Frequency management is the ability of a system to withstand ***frequency*** perturbations. The services are inertia, synthetic inertia, FFR, FCAS and — outside of the scope of this package of changes — generator governor performance.

While a secure system relies on both system strength and frequency management, the required services should not be conflated, even though some facilities can provide both and this is a source of some complexity.

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[1] Synthetic inertia is frequency support that acts within one or two frequency cycles. Fast frequency response is frequency support that is provided within around 2 seconds.

1.2.1.2 *Inertia's role in frequency management – stiffer systems need less management*

Inertia is the ability of a system to withstand perturbation in frequency — the "stiffness" of the system. A stiffer system is inherently less able to be perturbed and requires less active frequency management.

The role of inertia — and the two related services, synthetic inertia and fast frequency response — is to prevent system collapse before the normal FCAS tools can respond and correct the system frequency. These services are, therefore, system wide in nature, although regional requirements may be needed in the event of, or risk of a synchronous electrical island.

1.2.1.3 *Why Inertia is different from voltage control*

Voltage control and fault level management are related to maintenance of a viable power system. These relate to the parameters of the network and connected elements. They are often localised requirements and provided by local suppliers or, to put it another way, cannot be transported far within a network. Although, once available in the system, additional voltage support can be dispatched by the market operator.

These services are therefore more localised in nature and best managed by TNSPs.

1.2.1.4 *How they interact*

For convenience inertia is often lumped together with system strength because key pieces of network equipment, e.g. synchronous condensers generally provide some inertia but can be scoped to provide additional inertia, at additional cost. In fact, almost all connected synchronous plant supply both system strength and inertia services. Inertia is also present in connected customer plant and equipment.

In addition, under the current Rules, TNSPs are the system backstop for both the provision of inertia and system strength.

1.2.2 Energy Networks Australia has considered the changes included in the consultation package.

1.2.2.1 *TransGrid — Efficient management of system strength on the power system (ERC0300)*

TransGrid's proposal would allow TNSPs to be more proactive in the provision of system strength in the NEM. This proposal aims to urgently address the issues with the current "do no harm" and minimum frameworks that were put in place in 2017 to manage system strength.

The request proposes to abolish the "do no harm" obligation and amend the minimum system strength requirements. Generators will not have to undergo the full impact assessment associated with the 'do no harm' obligation but would still be required to negotiate and meet generator performance standards (GPS) to connect.

The current minimum system strength framework is proposed to be integrated into TNSPs' ordinary planning and regulatory frameworks. TNSPs are obligated to maintain the system strength levels for each node defined in their network to meet the standard set by an independent body (TransGrid proposes the Reliability Panel).

AEMO would retain responsibility for determining fault level nodes and the minimum fault level that is required at each node. In circumstances that longer term plans do not capture sufficient levels of system strength, AEMO would also be able to declare shortfalls of system strength as an NSCAS gap.

Energy Networks Australia supports the intent of this proposal with some potential variations. Energy Networks Australia's comments on this change are below in Section 2.

1.2.2.2 *Hydro Tasmania — Synchronous services markets (ERC0290)*

Hydro Tasmania proposes to create a market for synchronous services such as inertia, voltage control and fault level (system strength). This new market aims to address the shortage of synchronous services by integrating the dispatch of these services into the existing energy and FCAS spot markets.

The system services requirement will be incorporated into the formulation of constraints currently applied in the NEM dispatch engine (NEMDE). With these reformulated constraints, the dispatch engine will co-optimise the dispatch of synchronous and non-synchronous generation to find the lowest overall cost, while also delivering the required levels of system services. An uplift to the wholesale energy price will be charged to consumers to recover the cost of providing these services.

Energy Networks Australia is only concerned with this Rule change in as much as it impacts on the provision of system strength by TNSPs. Energy Networks Australia's comments are below in Section 2.

1.2.2.3 *Infigen Energy — Fast frequency response market ancillary service (ERC0296)*

Infigen proposes to introduce two new contingency FCAS markets (raise and lower) for fast frequency response (FFR) services. This aims to efficiently manage power system risks associated with reduced system inertia due to the increased penetration of inverter-based generators displacing synchronous thermal generators.

The markets for raise and lower FFR are proposed to operate in a similar manner with the existing market arrangements for FCAS, in which the NEMDE co-optimises energy and system services.

Energy Networks Australia supports the general principle of efficient provision of frequency management in the NEM, including co-optimising inertia, synthetic inertia and fast frequency response. Energy Networks Australia does not, however, comment on this specific change.

1.2.2.4 *Infigen Energy — Operating reserves market (ERC0295)*

In this rule change proposal, a dynamic operating reserve market is introduced to operate alongside the existing NEM energy and FCAS spot markets. This aims to assist AEMO to manage new and emerging operational challenges related to extreme weather events and unknown modes of failure.

The proposed operating reserve market for the dispatchable raise-only service would procure reserves 30 minutes ahead of time (with a 15-minute call time) to align with the requirement to return the system to a secure operating state within 30 minutes. The procurement is similar to contingency FCAS services (FFR) that is co-optimised with the other energy and system services.

As noted in respect of the previous proposal Energy Networks Australia supports the general principle of efficient provision of reserves in the NEM. Energy Networks Australia does not, however, comment on this specific change.

1.2.2.1 *Delta Electricity — Introduction of ramping services (ERC0307)*

Delta proposes to introduce 30-minute raise and lower "ramping" FCAS services. This aims to address the increased price volatility (and consequently potential AEMO interventions) that exists when dispatchable generators ramp through their energy bid stacks in response to predictable, daily, high rates of change from solar ramping up and down.

It is proposed that 30-minute raise and lower "ramping" FCAS services would be procured through a similar dispatch and settlement process to existing FCAS raise and lower services. This proposal relates to Delta's separate proposal on capacity commitment mechanism for system security and reliability services rule change, which is summarised below.

Here also Energy Networks Australia supports the general principle of efficient provision of frequency management in the NEM. Energy Networks Australia does not, however, comment on this specific change.

1.2.2.2 *Delta Electricity — Capacity commitment mechanism for system security and reliability services (ERC0306)*

In this proposal, a new ex-ante, day ahead capacity commitment mechanism and payment is introduced to provide access to operational reserve and any other system security or reliability services required for system security and reliability objectives. This aims to address shortfall issues of system security and reliability services during the increased periods of low prices when slow start, non-peaking dispatchable generators find it operationally and financially challenging to be available with the current self-commitment mechanism.

The proposed new ex-ante day ahead capacity commitment mechanism and payment would keep non-peaking dispatchable generators online at their minimum safe operating level (MSOL) and meet the operational reserve required for system security and reliability.

Energy Networks Australia supports the efficient dispatch of capacity in the NEM. We note — also — that the post 2025 discussion paper opines that ahead markets will allow more effective coordination of the provision of frequency management. This could impact TNSPs through the commitment of synchronous converters.

Energy Networks Australia considers that any provision of ahead markets should be fully coordinated with the post 2025 market design. Other than this comment, Energy Networks Australia offers no comment on this specific change.

1.3 Focus of Energy Networks Australia

Energy Networks Australia is concerned with the contribution Network Service Providers can and should make to support the system in terms of:

- System strength: the ability of the system to withstand perturbations of voltage
- Frequency management: the ability of the system to withstand perturbations of frequency

As discussed in section 1.1, above, there is some interaction between the two aspects because of a key common source of supply, but the main role of networks is system strength.

In this paper, Energy Networks Australia examines the most cost-effective provision of system strength. As a primarily local service TNSPs are best placed to be the primary provider and are always the backstop. In addition, the role of TNSPs as the backstop for inertia is still considered appropriate.

The focus of this response is therefore on two Rule changes — the TransGrid proposal and the Hydro Tasmania proposal.

Energy Networks Australia also notes that there is an increasing need for coordination with resources owned and managed by DNSPs and also between emerging market participants, existing participants and AEMO.

There are also requirements to coordinate between TNSPs. While the Integrated System Plan provides a basis for this, there is also a role for adjacent TNSPs to work together even more to achieve least cost, greatest benefit outcomes.

1.3.1 Pricing of value streams is important

An important consideration to ensure economically efficient provision of services is that each system service is correctly valued — both at the time of investment and the time of dispatch. The chosen market or approach to funding the services must provide a means for all suppliers to provide their services efficiently — at the right time, the right place and the right quantity.

The pricing of services and the ability of suppliers to access those prices is therefore a key issue for the Rule changes.

2 Key considerations

2.1 The AEMC framework

Energy Networks Australia supports the broad assessment framework put forward by the AEMC in the discussion paper. Energy Networks Australia also supports the AEMC proposed systems services objective — accepting that it is an appropriate narrowing of the NEO for the purposes of examining these Rule changes.

Energy Networks Australia is concerned, however, that the framework does not currently describe the relevant products in sufficient detail. It will be easier to apply the framework when each product or service is more clearly defined.

That said, the framework of assessing transparency, simplicity and predictability — as well as practical implementation — of the proposals is well founded. Coupled with Energy Networks Australia's criteria of supporting or not hindering the post 2025 design, the frameworks adopted will support an efficient outcome.

2.2 Services or products

It is not possible to provide a single measure for system strength as it is composed of different elements — with voltage support and fault level management the key items. Commoditising specific elements of all of the elements that go together to provide 'strength' may lead to perverse outcomes. Each element needs to be defined as a measurable service or characteristic of the network, which is difficult.

Importantly, each of these services can be provided by different types of plant. For example, voltage support can be provided by synchronous generators, synchronous condensers or inverter connected plant connected to either transmission or distribution. Note these are sources of dynamic voltage control over and above static plant such as capacitor banks, and the inherent reactive power characteristic of customer demand and network assets for which the NSPs have detailed knowledge and responsibility.

The cost-effective provision of these services, therefore, needs to define the specific (dynamic) service in such a way that the most efficient provider can be identified and appropriately compensated. This requires examination at the local level — with the ability to co-optimise between distribution and transmission.

Energy Networks Australia contends that this is best achieved where the TNSP is responsible for — as the minimum — the contracting of system strength services. The Jurisdictional Planner is best placed to do the detailed planning at the local level and to coordinate with adjacent Jurisdictional Planners and DNSPs.

For frequency services, TNSP facilities may also have a role in providing inertia. Inertia, however, is primarily a system characteristic related to power system frequency, regardless of how it is supplied. Inertia, synthetic inertia, fast frequency response and generator governor response determine the extent of perturbation of frequency in the critical first moments of a frequency disturbance. Least cost provision of management of frequency disturbances requires that these factors should be (co-)optimised.

TNSPs can have a role in providing inertia where a shortfall in inertia from other sources occurs – this is the current situation – but the backstop role is highly reactive and compromises TNSPs ability to optimise the design of synchronous condensers. There should be a framework to consider the benefits of procuring additional inertia if a RIT-T to procure system strength results in procurement of one or more synchronous condensers. Here, TNSPs would undertake a RIT-T that considers the incremental benefit of additional inertia alongside any benefit of increased voltage control. If demonstrated, TNSPs would be entitled to include the cost in RAB.

Provision of inertia by TNSPs is currently a backstop — determined by a declaration by AEMO — and investment is optimised at that point through the TNSP processes. Energy Networks Australia considers that this backstop role for inertia should continue.

2.3 System strength

2.3.1 General considerations

Energy Networks Australia members recognise the challenges of the efficient provision of system strength and the desire to create 'markets' to have the services delivered organically. Energy Networks Australia supports this approach where it can be efficiently applied — noting that the term market is used here as a generic term and can be formed by dynamic energy spot markets, contracts, auctions and other approaches.

Where it is not technically or economically feasible to create new markets, due to the technical complexity or locational nature of the services — including limited providers — which limits the scope for competition, efficient arrangements should be put in place to plan, procure, value and fund the delivery of these services. The focus is to provide clear responsibilities for planning and provision. Energy Networks Australia supports this aspect of the TransGrid proposal.

As system strength requirements are often locational, Energy Networks Australia doubts a dynamic market will be feasible and the provision of a workable and sufficiently strong grid is a core obligation on Jurisdictional Planners and TNSPs. As a minimum, therefore, the Jurisdictional Planner must have a local role interpreting the overall Integrated System Plan as it applies within a region.

System strength is a necessary pre-condition for meeting a range of transmission network performance standards and licence obligations — including proper operation of protection systems and quality of supply to customers. As such it should, in the main, remain a network service managed by the Jurisdictional Planner as the party accountable for shared transmission network service outcomes.

2.3.2 Energy Networks Australia supports the intent of the TransGrid proposal

The TransGrid proposal for the efficient provision of fault levels is supported by the TNSPs within Energy Networks Australia. The approach is transparent, simple and cost-effective. It is also readily implementable in the short term. It therefore meets all of the requirements laid out above in section 2.1.

Energy Networks Australia considers, however, that some aspects of the proposal could be amended without damage to the main thrust of the approach

2.3.3 A forward looking and operable framework

A more proactive and coordinated approach to system strength is required. The current approach — where individual generator proponents must meet do no harm provisions and TNSPs can only procure to meet a shortfall of system strength once it is declared by AEMO — creates inefficient investment in system strength services. This also increases the cost of generator connections and increases the cost and risk of operating the power system securely.

Energy Networks Australia considers that the current, short-term reactive approach to deliver a theoretical minimum system strength level is too short-sighted and does not sufficiently enable holistic planning for the long-term management of system strength and related system security requirements. The need to securely operate the power system under a wide range of operating conditions means the frameworks need to provide for a degree of headroom and Energy Networks Australia would recommend inclusion of a stronger operational overlay on the forward planning requirements.

Energy Networks Australia therefore considers that:

» An independent body, such as the Reliability Panel, should set the approach to system strength and the standard to ensure appropriate evaluation of risk and cost.
» The Jurisdictional Planner would define the requirements and plan for local provision — including appropriate liaison with other planners and the distribution level providers.
» the TNSP should meet the levels of system strength required in line with the ISP through the application of the RIT-T.

This approach provides a discipline on procurement and cost-benefit options analysis for prudent regulated investment and cost recovery. This approach was widely supported in responses to the AEMC's system strength frameworks investigation.

2.3.4 The current "do no harm" requirement

The do no harm requirement — as it stands now — inhibits TNSPs from providing a co-optimised approach for system strength. It requires individual connecting generators to pay for the minimum standard to compensate for their own impact on the system strength of the grid.

This should remain as a component of a future framework to provide locational signals to connecting generators. Generators that choose to locate in areas of low system strength should be responsible for the costs to maintain system strength.

The AEMC should explore further options to provide appropriate incentives on generators regarding where to locate on the power system and what equipment to connect. This should include considering whether generators should pay for the service.

2.4 Market for system services — the Hydro Tasmania proposal

2.4.1 The models

Hydro Tasmania proposes to create a market for synchronous services such as inertia, voltage control and fault level to address the shortage of synchronous services by integrating the dispatch of these services into the existing energy and FCAS spot markets. The current constraints in the NEM dispatch engine will be reformulated to incorporate the synchronous services requirement. With those, the dispatch engine will co-optimise the dispatch of synchronous and non-synchronous generation to find the lowest overall cost, at the same time delivering the required levels of system services.

To achieve that the following main amendments and implementation are proposed by Hydro Tasmania:

- A new generator category of synchronous service generator (SSG) is created to allow AEMO to reconfigure the dispatch engine such that relevant generator's online status (or circuit breaker status) be moved to the output side of AEMO's constraint equation.
- Generators provide two additional fields in their spot market bids to AEMO indicating cost and availability of synchronising units online.
- Generators will be paid and settled based on their bid price for providing synchronous services rather than the spot price.
- Consumers/load will be charged an uplift to the wholesale energy price.

2.4.2 The preferred approach

Energy Networks Australia is only concerned with this Rule change in as much as it impacts on the efficiency of the overall approach to providing system strength. While this market may be useful for providing synchronous services for inertia, voltage control and fault level (the latter two are core components of system strength) in aggregation, it does not reasonably and comprehensively address the system strength management issues discussed above in section 2.2 and 2.3, particularly ensuring enough investment.

The proposed market-based model with cost co-optimisation over the existing short term 5-minute interval with existing FCAS and energy does not ensure the long-term planning and coordination of investment. In addition, the location-specific needs of system strength, potential local market power, and the complexities in reformatting the NEMDE constraints whenever there is any change in the synchronous generators and networks would make the market-based model less practical.

Energy Networks Australia is of the view that the Hydro Tasmania's market-based model will not be able to address system strength issues.

AEMC

Consultation paper - System services rule changes

STAKEHOLDER SUBMISSION TEMPLATE

The template below has been developed to enable stakeholders to provide their feedback on specific questions that the AEMC has identified in the Consulattion paper for the System services rule changes.

The rule changes discussed in the system services consultation paper are:

- AEMO – *Primary frequency response incentive arrangements* (ERC0263)
- Hydro Tasmania — *Synchronous services markets* (ERC0290)
- Infigen Energy — *Operating reserves market* (ERC0295)
- Infigen Energy — *Fast frequency response market ancillary service* (ERC0296)
- TransGrid — *Efficient management of system strength on the power system* (ERC0300)
- Delta Electricity — *Capacity commitment mechanism for system security and reliability services* (ERC0306)
- Delta Electricity — *Introduction of ramping services* (ERC0307)

This template is designed to assist stakeholders provide valuable input on the questions the AEMC has identified in the consultation paper. However, it is not meant to restrict any other issues that stakeholders would like to provide feedback on.

Given the breadth of issues discussed in the consultation paper, it is not expected that all stakeholders respond to all the questions in this template. Rather, stakeholders are encouraged to answer any and all relevant questions.

SUBMITTER DETAILS

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CHAPTER 1 – INTRODUCTION

Question 1: Section 1.2 & 1.3 – Current ESB & AEMO work relating to the rule change requests	
1) What are stakeholders' views on how the rule change processes should be integrated with ESB and AEMO work programs?	*Support continued AEMC progression of the rules and agreed that some aspects of the power system need to be dealt with more urgently — for example, the TransGrid system strength Rule change. The AEMC should not immediately proceed with changes that are better managed in the Post 2025 market* *Agree that there are interactions with post 2025 market program and the AEMC needs to ensure that this work will not foreclose options for the post 2025 market and will complement or be consistent with the ESB's post 2025 reform reccomendations.* *The ESB work should be an input into the further consideration of these rule changes by the AEMC.*
2) Are there any additional processes that should be closely considered by the Commission when progressing these rule change requests?	*Need clarity on the problem we are solving — clearly defining products and services — and their inherent nature — is an essential step in defing how best to provide the services.* *The Investigation into system strength frameworks in the NEM — EPR0076 — is directly relevant to the consideration of this set of Rule changes.* *The primary concern is having a secure power system and keeping the lights on but not at any cost. The primary objective is not creation of markets but meeting the NEM power system service requirements at least cost — for example the intent of the TransGrid Rule change.* *Before proceeding, the service and the demand curves need clear definition and appropriate governance frameworks.* *Whether its through these rule changes, post 2025 market streams or Renewable Integration Study (RIS) recommendations there needs to be a cost benefit before proceeding with rules — including the ability of industry stakeholders to deliver this level of change/complexity.*
Question 2: Section 1.6 – Timetable for the consultation process	
1) Do stakeholders have any comments on the proposed timetable for the system services rule changes?	*Effectively this is operating in parallel or leading the post 2025 process reform. The AEMC should be mindful to progress some rule changes only where it can do so holistically, once critical inputs from the ESB and AEMO processes are available.* *Note that there are interactions with incentives for primary frequency response and system strength investigations — but the two services need to be considered separately.* *Whether its these rule changes, post 2025 market streams or RIS recommendations there needs to be a cost benefit before proceeding with rules — including the ability of industry stakeholders to deliver this level of change/complexity.*

CHAPTER 3 – APPROACH

Question 3: Section 3.2 & 3.3 – Three work streams: dispatch, commitment and investment

1) Do stakeholders agree with the AEMC's approach to grouping the rule changes, at least for initial consideration?	*The issues raised by the TransGrid Rule change need to be progressed as they deal with an immediate problem.* *Hydro Tasmania's Synchronous services market (ERC0290) rule change does not appear suitable to be grouped in Investment group as it tends to deal with shorter term issues.*
2) Do stakeholders believe that Figure 3.1 captures the key issues to be considered for each rule change in each time frame?	*Yes. If the service requires investment in equipment or process to incentivise the additional investment, there will need to be transparent price signals. The nature of the price signal and how it is developed is an important considation.*
3) Do stakeholders have views on whether/which services should be procured in certain time frames and not others?	*The time frames are service dependant — for example, inertia may need to be purchased both at the time of connection and later at the time of dispatch. System strength needs to be considered in the work of the Jurisdictional Planner and the time frames will be dependent on the service and the evolving situation on the grid, with the costs and benefits of alternative options appropriately weighed at the time.*

CHAPTER 4 – ASSESSMENT FRAMEWORK

Question 4: Section 4.2 – The system services objective	
1) Do stakeholders agree with the AEMC's proposed system services objective being used to assess these rule changes? If not, how should it be amended or revised?	*The Systems Service Objective appears to be a reasonable narrowing of the focus of the NEO for the purposes of these rule change proposals.*
Question 5: Section 4.3 – The planning, procuring, pricing and payment service design framework	
1) Do stakeholders agree with the '4Ps' service design framework being used to assess these rule changes?	*Need to be sure that the actual service or product is clearly defined. System strength is not a product, in itself but rather a collection of products — fault level remediation, voltage support etc. Defining the detailed product clearly and in a technology neutral way is a key requirement. The definition and framework will need to take into account the interactions between the products.* *Otherwise, Energy Networks Australia generally supports the framework.*
Question 6: Section 4.4 – Principles for assessment	
1) Do stakeholders agree with the principles proposed for assessing the rule change requests? If not, should any principles be amended, excluded or added?	*In principle agree. The transparent, predictable and simple principles could just as easily apply to system strength or inertia, not just FCAS. Transparency and governance are important considerations.* ***Practicality of implementation**, a principle for consideration from the ESB assessment framework for market design post 2025, should be considered to be included. This principle is about whether the market design under consideration will be put in place in a timely and workable manner to deliver expected outcomes. Energy Networks Australia notes that this is different from the implementation consideration described in section 9.4 of the consultation paper which is about implementation priority, challenges and interactions with other reforms.*

CHAPTER 5 – THE RULE CHANGE REQUESTS

Question 7: Section 5.1 – Infigen – Fast frequency response ancillary service market	
1) What are stakeholders' views on the issues raised by Infigen in its rule change request, Fast frequency response market ancillary service?	No comment
2) Do stakeholders agree with Infigen's view that a change to the NER is required to encourage efficient provision of FFR services in the NEM following contingency events?	No comment
3) What are stakeholders' views on if there are any other issues or concerns in relation to frequency control in the NEM as levels of synchronous inertia decline?	No comment
4) Do stakeholders consider there are alternative solutions that could be considered to improve the frequency control arrangements in the NEM for managing the risk of contingency events as the power system transforms?	No comment
5) Do stakeholders consider that 5-minute markets for FFR ancillary services likely to be effective and efficient in the global interconnected NEM and on a regional basis?	No comment
6) Do stakeholders consider Infigen's proposal will provide adequate pricing signals to drive efficient investment in FFR capability in the NEM?	No comment
7) What are stakeholders' views on, if introduced, how the costs associated with any new FFR market ancillary services should be allocated?	No comment
8) What do stakeholders consider to be the likely costs associated with establishing two new ancillary service markets for FFR in the NEM?	No comment
9) What are stakeholders' views on how the proposed solution may result in any substantial adverse or unintended consequences in the NEM?	No comment
10) Are there specific issues with FFR that stakeholders think should be addressed in the NER as part of the establishment of markets for FFR services?	No comment
Question 8: Section 5.2 – Infigen – Operating reserves market	
1) Do stakeholders agree with Infigen that tight capacity conditions and increasing uncertainty in market outcomes are problems that an operating reserve would address?	No comment
2) Are there alternative solutions that could be considered to address tight capacity conditions and increasing uncertainty in market outcomes?	No comment

3) Do stakeholders consider Infigen's proposal would provide adequate pricing signals to drive efficient use of and investment in operating reserve services now and in the future?	No comment
4) How do stakeholders think separate operating reserves arrangements would affect available capacity in the spot, contracts and FCAS markets now and in the future?	No comment
5) How do stakeholders think separate operating reserves arrangements would affect prices in the spot, contracts and FCAS markets now and in the future?	No comment
6) How could the design of an operating reserve market (e.g. criteria for eligible capacity) best support competitive outcomes both in the operating reserves market but also energy and FCAS markets?	No comment
7) What are the factors that should be considered when seeking to set and procure efficient levels of operating reserve?	No comment
8) Would Infigen's proposed operating reserve market result in any substantial adverse or unintended consequences in the NEM?	No comment
9) What are the costs associated with establishing an operating reserve market in the NEM? If introduced, how should these costs be allocated?	No comment
10) What kind of incentive/penalty arrangements would be necessary to be confident the operating reserves procured are available when needed?	No comment
Question 9: Section 5.3 – Delta Electricity – Introduction of ramping services	
1) Do stakeholders agree with Delta that price volatility that occurs when dispatchable generators ramp through their energy bid stacks in response to predictable, daily, high rates of change from solar ramping up and down is a problem that needs addressing?	No comment
2) Do stakeholders think that a new raise and lower 30-minute FCAS would address the price volatility at these times? Are there alternatives that could be considered to address this problem?	No comment
3) Do stakeholders consider Delta's proposal would provide adequate pricing signals to drive more efficient use of and investment in ramping services thanks existing price signals and information provided through the PASA and pre-dispatch processes?	No comment
4) How do stakeholders think a separate 30 minute ramping product would affect available capacity in the spot, contracts and FCAS markets now and in the future?	No comment

5) How do stakeholders think a separate 30 minute ramping product would affect prices in the spot, contracts and FCAS markets, now and in the future?	No comment
6) How could the design of a ramping FCAS product (e.g. criteria for eligible capacity) support competitive outcomes in both energy and FCAS markets?	No comment
7) What are the factors that should be considered when seeking to set and procure efficient levels of ramping services?	No comment
8) Would Delta's proposed new 30-minute raise and lower FCAS products result in any substantial adverse or unintended consequences in the NEM?	No comment
9) What are the costs associated with establishing new 30-minute raise and lower FCAS products in the NEM? If introduced, how should these costs be allocated?	No comment
10) What kind of incentive/penalty arrangements would be necessary to be confident the new 30-minute raise and lower FCAS products procured are available when needed?	No comment
Question 10: Section 5.4 – Delta Electricity – Capacity commitment mechanism for system security and reliability	
1) Do stakeholders agree with Delta that there is an increasing risk that capacity capable of providing reserves or services may not be available at times when the power system may need them to respond to unexpected events because of increasing incentives to de-commit?	No comment
2) Do stakeholders think that a mechanism to commit capacity one day ahead of time would deliver the reserves or services needed? Are there alternatives that could be considered to address this problem?	No comment
3) Do stakeholders consider Delta's proposal would provide adequate pricing signals to drive more efficient use of and investment in reserves and system services?	No comment
4) How do stakeholders think Delta's capacity commitment payment would affect available capacity in the spot, contracts and FCAS markets now and in the future?	No comment
5) How do stakeholders think Delta's capacity commitment mechanism would affect prices in the spot, contracts and FCAS markets now and in the future?	No comment
6) How would a capacity commitment mechanism and payment affect entry, exit and competition in the NEM over the short and long term?	No comment
7) What are the factors that should be considered when deciding how much capacity to commit ahead of time?	No comment

8) Would Delta's proposed capacity commitment mechanism result in any substantial adverse or unintended consequences in the NEM?	No comment
9) What are the costs associated with establishing a capacity commitment mechanism in the NEM? If introduced, how should these costs be allocated?	No comment
10) What kind of incentive/penalty arrangements would be necessary to be confident that the committed capacity would be available throughout the commitment period and/or when called upon?	No comment
Question 11: Section 5.5 – Hydro Tasmania – Synchronous services markets	
1) Do stakeholders consider this rule change proposal presents a viable model for the provision synchronous services? a) Could this proposed model be used to provide the essential levels of system strength (and / or inertia and voltage control) needed to maintain security and the stable operation of non-synchronous generation? b) Could this proposed model be used to provide levels of system strength (and/or inertia and voltage control) above the essential level required for security?	*Need to clearly define the services — voltage control and inertia are different services. Inertia interacts with, and needs to be grouped with Synthetic Inertia and FFR as means of reducing RoCoF after contingencies. A single device may provide both inertia and voltage support, but the the two services should not be conflated. The requirements for individual services need to be assessed separately.* *System strength needs to be considered separately as it is often locational. It is less amenable to a dynamic market. As the AEMC noted in the system strength investigation, there is value in considering inertia with system strength, as it may be provided in conjunction with the system strength service where synchronous condensors are procured with this in mind.* *Timeframe is an issue — there is a need to ensure sufficient services are available for dispatch — which may require investments well ahead of the time. It is not clear that the Hydro Tasmania approach will bring forward the necessary investments.* *The acquisition of the services needs to allow co-optimisation. Without co-optimisation there is a risk of significant inefficiency.*
2) Do stakeholders consider that the creation of a synchronous services market could have any adverse impacts on other markets in the NEM? If so, what are these impacts?	*Noting the timeframe issue, a SSG market could operate in parallel with other NEM markets. It is an extension of frequency management.* *The link to System Strength is less clear and there would be concern that NSPs would need to step in if a dynamic market for System Strength did not deliver. This could potentially occur at late notice, resulting in poor outcomes for an extended period. It is not clear how the provision of both services could be co-optimised in this market given their different nature.* *The SSG arrangement from Hydro is optimised for synchronous generators and does not consider the differing ways to provide system strength and inertia, or that alternative technologies may further evolve to do so in the future.*
3) Would the proposed model set out in the rule change request efficiently price and allocate costs for synchronous services in the NEM?	*As in Energy Networks Australia's answer to 2), it is not clear that this approach will efficiently price non-traditional sources of inertia. Energy Networks Australia accepts, however, that the bundling may co-optimise Inertia with other Synchronous services.*

4) Do stakeholders consider the model set out in the rule change request to be capable of sending price signals sufficient to encourage new investment in synchronous capacity?	*This focuses on the efficient use of existing resources, but it is not clear how it will bring on the required level of system strength resources investment. The price signals in investment timeframes would arise in contract and forward markets — which have not evolved for FCAS. There is a high risk that this would not deliver.*
5) Do stakeholders consider the rule change provides an appropriate incentive mechanism for existing synchronous generators to make operational decisions to provide synchronous services?	*Operational decisions are likely to depend on the SSG price and whether the SSG service is itself profitable to the generator. The pricing of synchronous services explicitly would provide additional incentives.*
6) Do stakeholders consider the rule change provides the appropriate locational signals for the provision of synchronous generators to provide synchronous services?	*Not directly — the use of a sub-regional price by adjusting the constraint equation seems inefficient. If it were to proceed it should be considered with any changes to the locational marginal price.* *This will depend on SSG price and granularity of implementation (noting the more granular the price signals, the greater the complexity and scope for competition issues). There may not be sufficient locational signals or price signals to warrant any new equipment investment or warrant changes to operational decisions.* *Locations of synchronous generators are also better determined based on proactive forward planning, which is best undertaken by the Jurisdictional Planner due to the information available to that party.*
7) What do stakeholders see as the primary opportunities / limitations of the mechanism as proposed by Hydro Tasmania?	*The mechanism is limited as it doesn't value all the services separately and may limit technology options or competition in particular services.* *Energy Networks Australia supports the intent of the the TransGrid proposal where essential levels of system strength would be centrally planned on a forward looking basis by the Jurisdictional Planner and optimised by the TNSP.* *Energy Networks Australia remains concerned about the costs and benefits of the co-optimised ahead services market.*
8) Would the model proposed in the rule change request enable effective competition in the market for the provision of synchronous services?	*Energy Networks Australia considers that as system strength is locational, this and other market based approaches to procurement may be impacted by limited competition.*
9) What suggestions do stakeholders have in relation to the first order changes that would be required in NEMDE to facilitate this proposal and any second order changes that may be required as a result of this rule change proposals' implementation?	*It is not clear that progressing this change independently of the 2025 Rule change is a cost-effective approach. The larger changes for the 2025 market may render changes to NEMDE to allow this change as unnecessary.* *In particular, the fuller two-sided, ahead and co-optimised system services arrangements propsed in the ESB program may conflict. As noted above the ESB work should be an input into the further consideration of these rule changes by the AEMC.*
Question 12: Section 5.6 – TransGrid – Efficient management of system strength on the power system	
1) Do stakeholders consider that TransGrid's approach addresses all issues related to system strength currently experienced in the NEM?	*Energy Networks Australia supports the intent of the TransGrid Rule change proposal. It addresses the majority of issues to secure reasonable levels of system strength.*

2) Do stakeholders consider that a system strength planning standard met by TNSPs would effectively and pro-actively deliver adequate system strength?	*The requirement on TNSPs to meet defined standard would allow them to optimise the purchase or construction of assets to support system strength. TNSPs are better placed to provide more localised services such as system strength. TNSP application of a RIT-T to demonstrate prudent investment based on a disciplined cost-benefit analysis of options further supports this.* *A system strength planning standard should not be targeted to theoretical minimum levels or presume a high degree of accuracy in the models, rather it should define a "minimum" requriement to allow for growth, planned outages and contingency events.*
3) Do stakeholders consider TransGrid's proposal will provide useful and timely locational and financial signals to new entrants?	*Yes. The clear lines of responsibility between AEMO and TNSPs would support more timely provision of the services. TNSPs are also better placed to assess distribution impacts. Enabling an approach where the Jurisdictional Planner plans for system strength in the medium to long term would be more efficient and would also signal better locations for plant to new entrants.*
4) Do stakeholders agree that the 'do no harm' obligations should be removed? a) If so, do stakeholders consider an alternative mechanism is required to regulate or incentivise the minimisation of a new connecting generator's impact on the local network and proximate plant?	*Energy Networks Australia supports locational signals for generators. This can be achieved in part through transparent information on where system strength will be supported on the power system. There may also be a case to keep aspects of the do no harm frameworks for generators who choose to locate in areas of low system strength at the far reaches of the network, and this should be further explored as part of an optimised coordinated approach.*
5) What are stakeholder's views regarding generators' being required to make a financial contribution for provision of system strength services?	*The AEMC should explore options to provide appropriate incentives on generators regarding where to locate on the power system and what equipment to connect. This should include considering whether generators should pay for the service. The "causer pays" approach can be efficient if the provision of the system strength services can be optimised. The alternative is that customers pay via TUOS. Customer payment could be supported where there is a clear benefit, for example, through the priovision of scale efficient solutions for system strength.*
6) Would stakeholders be supportive of the ownership of existing private system strength assets being transferred to TNSPs, as suggested in TransGrid's rule change request?	*Energy Networks Australia has no comment on this point.*
7) Would the proposed, TNSP-led solution to system strength result in any adverse or unintended consequences for market participants in the NEM?	*Centralised provision by AEMO could provide greater coordination between regions or TNSP areas but the downside is less localised optimisation. AEMO would need to do more detailed planning and contract deeper into the system. TNSP procurement is more robust and transparent with AER oversight of costs.* *The Jurisdictional Planners are better placed to proactively identify the service requirements. They are also best placed to work with TNSPs and DNSPs to coordinate procurement and management of the services. There needs to be cross boundary coordination to ensure an optimised solution for the grid as a whole.* *It is essential for this to work that TNSPs assess both network and non-network solutions in a transparent manner — as well as coordination wth DNSPs.*

CHAPTER 6 – SYSTEM STRENGTH

Question 13: Section 6.1 – Evolving the regulatory definition of system strength	
1) Do stakeholders consider that the AEMC's working description of the effects of system strength, and related problem description of system strength and its components accurately represents all elements of system strength, as experienced in the NEM?	*Broadly agree with the description and the phenomena of system strength. However, the definition of system strength as a service appears to be challenging, given a specific technical working group has been working on the issue and — we understand — has not reached agreement.* *The Energy Networks Australia considers that the regulation needs to consider the specific services that are required not the overall notion of system strength. This includes the locational nature of the services, the price signal to encourage investment and the lead time to ensure equipment is commissioned in time for when it's needed.*
2) If not, are there other components of system strength that the AEMC should include?	*System strength is a characteristic of the system which can be supported by the provision of services. The focus needs to include the separation of these two ideas.*
3) What measures might be used to define system strength? Is fault level the only measure that can be used practically, or are other measures available?	*No, fault level is not the only measure, as described there are a range of influences and interactions on the power system that make it challenging. System strength is a combination of a number of parameters, which should be defined, measured and included in the system standards. The system strength frameworks investigation should be considered to inform this issue.* *There are also locational issues that are not reflected in a simple measure — including the interaction between distribution and transmission.*
Question 14: Section 6.2 – Mechanisms to provide system strength above the essential levels that are necessary for security	
1) Do stakeholders consider the centrally coordinated model, as proposed by TransGrid, is the preferable option for providing system strength above the essential levels required for secure operation?	*Yes, a measure of central coordination is essential.* *Of equal importance is the need for a clear framework. The TransGrid approach is a timely, simple, transparent method of procurement aligned to the ISP forecasts and incorporates localised knowledge from the Jurisdictional Planner. TNSP provision must include consideration of non-network solutions and coordinated optimisation among NSPs.*
2) Do stakeholders consider the decentralised, market-based model proposed by HydroTasmania to be the preferable option for providing system strength above the essential levels required for secure operation?	*No. It does not optimise the provision of system strength nor fully support new methods for frequency management.* *Energy Networks Australia does not believe an effective decentralised, dynamic market will emerge to support system strength. The ESB's recently released System Services and Ahead Markets paper in Table 3, recognises that system strength services are unlikely to have a favourable degree of competition or be able to be scheduled and priced adequately in dispatch[1]..*
3) Could a hybrid of these models be used to deliver system strength above the essential level?	*Possibly, as discussed in 1) above.*

[1] Energy Security Board, System Services and Ahead Market, April 2020, p20

4) What do stakeholders perceive to be each model's strengths and weaknesses?	*TransGrid's model is clear and provides clear local coordination for system strength. It enables medium to long term planning to facilitate scale efficient provision of system strength at lower costs to consumers.* *The Hydro Tas model is a market-based approach and could provide a clear signal but it is not clear how it supports the use of synthetic inertia and optimises with FFR. The link to system strength is based on plant characteristics, plant location and not the service to be provided or the needed location.*
5) Do stakeholders consider there are other, alternative models for delivering system strength above the minimum levels required for secure operation?	*As noted in the AEMC system strength investigation, models 3 and 4 could not address the issues alone but could be considered in conjunction with another option.*
6) What do stakeholders perceive to be the biggest benefits and risks to introducing a mechanism to deliver system strength above the minimum levels required for secure operation?	*A more proactive planned approach will be helpful for VRE hosting capacity and may reduce wholesale spot prices. The ability for generators to contribute to support their own investment would provide a cost-effective way of allowing additional capacity but allowing a TNSP to assess the requirements and coordinate the provision of system strength may provide a better outcome for connecting parties and consumers — including providing services above the minimum requirements. A mechanism to deliver system strength above minimum levels would support growth, planned outages and contingencies on the network.*

CHAPTER 7 – OPERATING RESERVE SERVICE

Question 15: Section 7.1 – Requirement for a dedicated in-market reserve service, mechanism or market	
1) What do stakeholders see as the key drivers or changes in the NEM that could be addressed by introducing an explicit in-market reserve arrangement?	No comment
2) Do stakeholders' think there is a need for an explicit in-market reserve arrangement in the NEM. If yes, do stakeholders consider the need to be permanent or transitional?	No comment
3) How would an explicit in-market reserve mechanism or market impact stakeholders? What would be the key benefits and costs? Would it effect stakeholders' operational or investment decisions?	No comment
4) Do stakeholders see there to be an explicit need for a capacity commitment mechanism as proposed by Delta? Do stakeholders see this as a separate need to an in-market reserve service?	No comment
Question 16: Section 7.2 – Achieving security and reliability using dedicated in-market reserves	
1) Do stakeholders have views on whether an in-market reserve market or mechanism should solve primarily for reliability outcomes and security outcomes second? Or can this be more effectively co-optimised?	No comment

2) How do stakeholders see an explicit in-market reserve market or mechanism interacting with the existing NEM reliability framework? What are the policy design priorities for a new operating reserves arrangement that would deliver the reliability needs of the power system?	No comment
3) How do stakeholders see an explicit in-market reserve market or mechanism interacting with the existing NEM security framework? What are the policy design priorities for a new in-market reserve market or mechanism that would deliver the security needs of the power system?	No comment

CHAPTER 8 – FREQUENCY CONTROL

Question 17: Section 8.1 – Reforms related to the provision of synchronous inertia	
1) Do stakeholders consider that the issues relating to declining levels of synchronous inertia have been adequately and accurately described?	*TNSPs have a concern that any market that is developed needs to allow optimisation that includes synchronous condensers — which can provide both inertia and system strength. Where it is needed and efficient, inertia can be added at the time of planning/procurement of synchronous condensers. While the services need to be separately defined, there is a need to optmise the provision of all market services to minimise the overall costs to consumers.*
2) Are there any other issues related to the provision of synchronous inertia that have not been adequately described?	*No*
3) What are stakeholders' views on the approach to considering the interaction between FFR and inertia in the NEM?	*Inertia and Primary Frequency Response management need to be optimised — including synthetic inertia, FFR and contingency/fast FCAS.*
Question 18: Section 8.2 – Reforms related to frequency control during normal operation	
1) Do stakeholders consider that the issues relating to frequency control during normal operation have been adequately and accurately described?	*Yes*
2) Are there any other issues related to frequency control during normal operation that have not been adequately described?	*No*
3) What are stakeholders' views on the proposed approach to reforming the process for the allocation of the costs of regulation services (Causer pays)?	*No comment*
4) Is the level of specification of regulation services in the NER fit for purpose as the power system transforms?	*No comment*
Question 19: Section 8.3 – Reforms related to frequency control following contingency events	
1) Do stakeholders consider that the issues relating to frequency control following contingency events have been adequately and accurately described?	*No comment*

2) Are there any other issues related to frequency control following contingency events that have not been adequately described?	*No comment*
3) What are stakeholders' views on the best way to address the challenges to managing system frequency following contingency events, including reforms to value and reward FFR?	*No comment*
4) Is the level of specification for contingency services in the NER fit for purpose as the power system transforms?	*No comment*

CHAPTER 9 – INTERACTIONS BETWEEN SYSTEM SERVICES

Question 20: Section 9.1 Technological and temporal issues for system service provision	
1) What are stakeholders' views on how the arrangements for system services can be developed, to best utilise the capability of both established, as well as new and emerging technologies?	*It is necessary to define the services into separate frequency management and system strength groups and then focus on the actual services to provide them. Based on the services, it should be possible to define processes for optimising them. System strength — in particular — needs a local focus that is best supplied via optimising processes of TNSP planning.*
2) Do stakeholders have any initial thoughts on how the arrangements for system services can be best coordinated over dispatch, commitment and investment time frames?	*Price signals, to ensure the minimum levels of services are available when and where they are needed, also need to be considered. As noted with system strength, there is no clear definition to enable commoditisation of the service, it is a service that is required by location and the interactions of generators and control schemes are complex.* *Frequency services are more readily commoditised and less locational in nature.* *Energy Networks Australia agrees — in principle — that a portofolio of services should be able to provide the same or better system performance. However, the costs and benefits of the reform to include the aheadness and co-optimisation of services needs to ensure that there is a benefit to consumers. It is important that the additional costs and complexities on a range of stakeholders do not lead to additional markets created with additional costs to consumers.* *Agreed that there are risks associated with early and late delivery of system services and with service capacity that is over or under requirements. The ahead and services market as part of the post 2025 market reform is expected to commence around mid-25, whereas system strength and inertia need to be addressed more urgently and in a more proactive manner. This is particularly the case where new generation is urgently needed to meet retiring synchronous generators and being encouraged by Governments through underwriting or improved planning processes to help stimulate the economy and mitigate the risk of early closures.* *The paper states the lowest cost outcome to consumers can be achieved by the co-optimisation of system services, yet there is no cost/benefit that teases out the incremental costs and benefits of these different rules or the ahead/services options in the post 2025 reform.*
Question 21: Section 9.2 – Aheadness and commitment	

1) Do stakeholders agree with the characterisation of arrangements for aheadness and commitment, including the potential benefits?	*It is important the objective of these rules or the post 2025 market reform is to ensure that system services at the same level at least, are made available through different arrangements to support the power system where and when they are needed.* *The services need to be available in predispatch or real time to meet the power system requirements. Ahead design is a financial commitment — not physical — it doesn't ensure the service is there in real time, generators or equipment can still fail or trip.* *The paper states that the aheadness affords market participants a balance of risks between energy producers and consumers. Energy Networks Australia is mindful that consumers may wish to ensure that the total costs of energy and services do not exceed the current costs to consumers.*
2) What are stakeholders' views on the potential downsides of introducing arrangements for commitment of capability ahead of dispatch?	*May not meet the urgency of the service requirement some 5 years out.* *May not be a sufficient price signal to justify the investment and as noted the risk of insufficient system services could be significant.* *Places AEMO in a dominant position selecting the mix of arrangements via contract but with limited transparency and oversight.*
3) Are there alternative arrangements that can reduce the increasing uncertainty associated with power system operation in the NEM?	*Yes, the Jurisdictional Planner planning for the medium to long term in relation to system strength, including the provision of inertia — where efficient.*
Question 22: Section 9.3 – Cost recovery arrangements	
1) What are stakeholders' views on the appropriate approach to cost recovery for each of the system services discussed in this paper?	*Agree with the statement that it is likely to be a compromise of complexity, volatility, accuracy and market signals and the different ways mentioned in the paper. Causer pays may lend itself to a service that is readily commoditised in dispatch and attributed to certain users.* *Energy Networks Australia considers that causer pays is appropriate where generators locate in weak parts of the system.* *This should be part of a more co-optimised approach where Jurisdictional Planners and TNSPs are able to provide a more efficient level of system strength at a lower overall cost to customers.*
2) In each case, how can the cost recovery arrangements be developed to lower the overall costs of the NEM?	*The Jurisidictional planner undertaking medium to long term planning of system strength services enables a scale* efficient procurement, to keep the system secure enough to keep delivering electricity to consumers across a range of operating conditions. *TNSPs assess remediation measures based on both network and non-network solutions and need to select the lowest cost provision to meet the power system needs. This allows innovative solutions to be considered against the service requirements. These processes are robust and transparent, with approval of efficient costs by the AER. There are checks and balances with a commercial entity that is not assured with entities that have no regulatory oversight. AEMC will need to consider the total costs of an AEMO coordinated and co-optimised solution and the time to implement and contract the necessary services with the timing of the needs in the power system and simpler alternatives of TNSP scale efficient procurement with payment via TUOS or generator pays.*

	AEMC may also like to consider the most recent cost estimates of AEMO and all stakeholders to deliver 5MS, GS and WDRM reforms and compare to the initial AEMO and stakeholder estimates.
Question 23: Section 9.4 – Implementation considerations	
1) What are the challenges or implications associated with implementing proposed arrangements discussed in this paper?	*There is insufficient analysis of say the HydroTasmania proposal to cater for improved inertia services compared to the post 2025 reform where inertia is being considered as one of the services in a co-optimised suite.* *It is not clear whether the HydroTasmania proposal would be able to be delivered earlier and provide an incremental benefit on the way to implementation of post 2025 market.* *A much fuller understanding of the sub models in the ahead and system services market designs is required from AEMO, including a likely program timeline to implement changes to systems, procedures, test etc.* *These should be compared to the costs and timeframes to implement the rule change proposals in this consultation paper.*
2) What are stakeholders' views on the prioritisation or staging of the reforms to address the issues discussed in this paper?	*5MS, GS and WDRM are significant reforms expected to be implemented around October 2021 onwards with the final meters converted over to 5-minute data by Dec 2022.* *Assuming these reforms are implemented smoothly, the system services and ahead markets are likely to be the next wave of work.* *The current AEMC COGATI market design proposes a move to locational marginal pricing in the wholesale market and financial trading rights. If this COGATI market design proceeds, it should be considered with these Rule change proposals and the post 2025 market design elements to enable efficient, least-cost delivery.* *The AEMC have undertaken significant work to analyse market design and the cost and benefits for COGATI, Energy Networks Australia would expect the same level of rigour for the system services market design and ahead market to ensure that there is a realisable net benefit for consumers.*