



Coordinating electricity market reform

**A framework to assess the congruency of wholesale
market reforms in the National Electricity Market**

A report for the Australian Energy Council

September 2019
kpmg.com.au

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Executive summary

The Australian Energy Council (AEC) has asked KPMG to develop a framework that can be used to assess the integration of different energy market reforms. This report follows KPMG's report on market design principles prepared for the AEC in 2018.¹

The electricity sector in Australia is changing in response to an increase in variable renewable generation, consumer empowerment, and a continued focus on maintaining reliability and security across the grid. To maintain pace with the rapidly evolving generation mix and technology change, policy makers have commissioned a number of inquiries and reviews.

While the Australian Electricity Market Commission (AEMC) continue to progress changes to the National Electricity Rules (NER) and undertake reviews, the formation of the Energy Security Board (ESB) has resulted in a dispersion of market reform responsibility. There is also an increasing level of activity and focus from federal and state governments on electricity policy development,² and the Australian Energy Market Operator (AEMO) and Australian Energy Regulator (AER) are playing more active roles in reform processes.

Adding to these complexities, two large-scale reviews are currently underway in the National Electricity Market (NEM) that could fundamentally alter the design. These are the:

- Coordination of Generation and Transmission Investment (COGATI) review being progressed by the AEMC; and
- Post 2025 Market Design for the NEM (NEM2025) review being progressed by the ESB.

The increasing complexity of the regulatory landscape and growing number of influencing parties increases the importance of having clear lines of accountability between the different decision makers, and transparency around how coordination between these parties is taking place.

Importance of coordinating multiple, discrete changes to the NEM

KPMG's task was to develop a framework tool to assist energy policy decision-makers and those advocating change to understand how well their proposals might fit within, or are congruent with, other proposals underway in the market. All stakeholders interested in energy policy development will find value from engaging with this tool.

Congruent reforms typically:

- reinforce market signals to participants;
- allocate risks efficiently and consistently to parties best placed to manage them; and
- deliver unique and complementary benefits to the market and its participants.

Congruent reforms require careful thought by decision-makers and a holistic view on the impacts on consumers. Reforms lacking congruency may create unforeseen changes to incentives that result in perverse outcomes, conflicting market signals that deter investment, and unnecessary costs and complexities that can erode the benefits of the reforms.

¹ KPMG, *Electricity Market Design Principles* (2018)

² For example: the Default Market Offer, Victorian Default Market Offer,

An outcome from applying the framework is to demonstrate the need for coordination and alignment between reforms holistically rather than individually, prompting more thorough analysis on the interactions and flow-on effects of each change to the market. Our framework cannot answer all questions and conclusions with regards to the level of integration of reforms in the NEM, but is there to provide a starting point for a conversation and debate.

We note that congruent reforms are in the long term interests of consumers and therefore promote the National Electricity Objective (NEO).³

The assessment framework

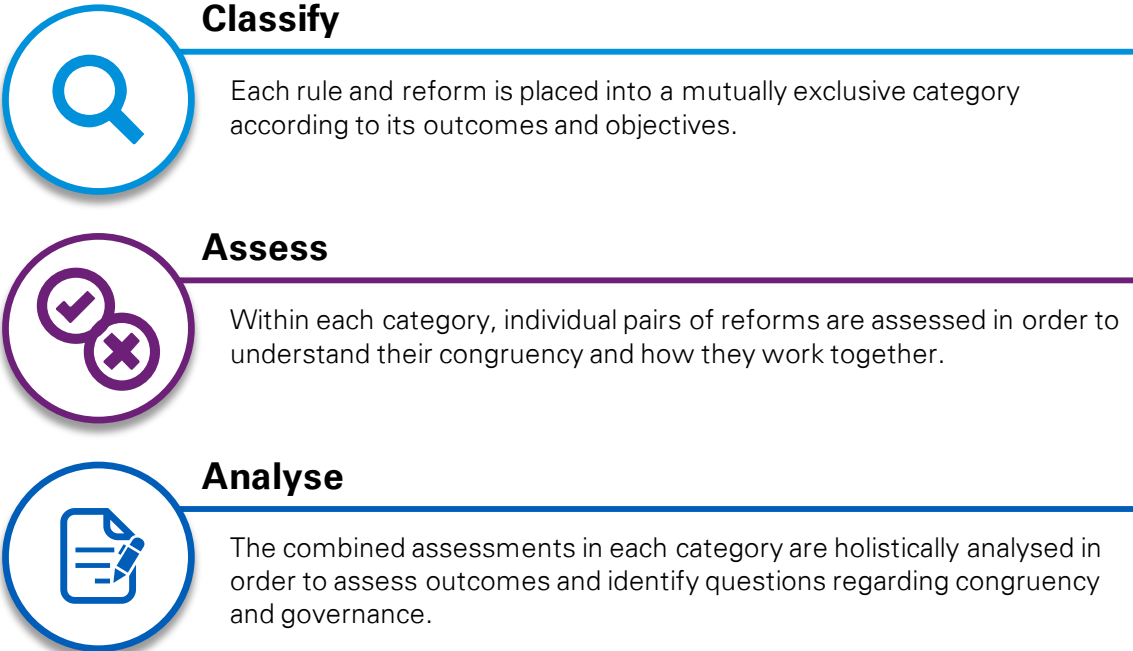
In order to make an assessment of the congruency of electricity market reforms, KPMG’s framework uses a piecewise approach to build a picture of the regulatory landscape.

After separating reforms into related categories, the framework methodically looks at individual interactions between pairs of reforms. Assessing these individual interactions requires a structured analysis that considers various factors concerning each reform pair, in order to form a view on how well they work together. This analysis can then be combined into a holistic view of the congruency of current reforms across the market.

We would expect the framework tool to be used by decision makers or proponents of reforms or rule changes in order to provide an assessment of congruency as part of a reform proposal or as part of an assessment process. This could include market participants or stakeholders, the AEMC, as well as other market bodies such as the ESB, AEMO, and AER.

The framework is made up of three key steps, as shown in Figure 1. Through undertaking a process to **classify, assess, and analyse**, interactions between reforms in the market can be identified and the congruency of reforms in the NEM assessed.

Figure 1: Overview of coordination framework approach



³ The NEO is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to the reliability, safety and security of the national electricity system.

Step 1: Classify

The initial step of the framework is to classify each reform into one of the following categories, relating to which part of the electricity supply chain in the NEM the reform predominately impacts upon:

- **Wholesale market**, relating to the operation of the wholesale electricity spot market and ancillary services markets in the NEM;
- **Contracting**, covering trading of electricity financial instruments through various means;
- **Generation**, relating to development, connection, operation, and function of generation assets in the NEM; and
- **Networks**, relating to the function of transmission/distribution networks and relevant standards.

This step ensures that the assessment and consequent analysis is performed on a smaller subset of rules and reforms in order to reduce complexity. While reforms should ideally only sit within one category, it is possible to place reforms in more than one category if need be.

Step 2: Assess

Once the reforms have been placed into their respective categories, a detailed assessment is carried out whereby the interaction between each pair of reforms within a category is assessed in more detail. The purpose of this step in the assessment process is to highlight any potential positive or negative interactions within a category.

The assessment between each pair of reforms looks at three areas:

- Extent of overlap in outcomes and objectives of the reforms.
- Congruency of the two reforms in practice.
- Acknowledgment of the interaction by the proponent or decision-maker of the reform.

Through a series of questions (see Section 3), each pair of reforms is graded on a scale from -5 to +5, referring to the materiality of the interaction. We have prepared a spreadsheet tool with this report to assist in undertaking the assessment. We note there is a degree of subjective judgement in undertaking the assessments, and other parties may form different views on how the questions should be answered.

For each category, a half matrix as shown in Figure 2 is populated as the scoring is completed. A positive score flags there may be positive interactions, while a negative score flags there may be negative interactions.

Figure 2: Sample of completed half-matrix from assessments

	Reform A	Reform B	Reform C	Reform D	Reform E	Reform F
Reform A		-4	-3	-4	0	0
Reform B			-2	0	4	0
Reform C				0	1	3
Reform D					2	0
Reform E						-1
Reform F						

Step 3: Analyse

Following the scoring of the reforms, it is important to evaluate the results in detail to understand why certain interactions exist between reforms and the potential impacts of those interactions. This step provides an overview of the congruency of the category as a whole (i.e. the number of linkages and common themes of congruency), as well as insights into potential impacts on consumers and the role of governance between the various reforms. Table 1 provides guidance on questions and lines of analysis to be considered in this assessment.

Table 1: Questions to guide the analysis

Qualitative analysis
Overview <i>This section covers the general findings between the two reforms and why the reforms have been flagged.</i>
What overlapping outcomes or objectives are the reforms addressing and why is this the case?
What are the general themes and observations with respect to the congruency of reforms in the category?
Impacts to consumers <i>This section covers how well the pair of reforms reflect the NEO, outlining costs and benefits to consumers.</i>
Do the overlapping reforms together promote efficiency in the long-term interest of consumers?
Are there concerns around the costs of the reforms outweighing the benefits? Are there inefficient costs from implementing various pairs of reforms?
Governance <i>This section covers potential governance reasons underpinning the overlap.</i>
How are the reforms planning to be implemented, and do overlapping reforms span one or more government or market institutions?
Was there appropriate communication and/or coordination between the market institutions regarding the overlapping pairs of reforms?

Applying the framework to reforms underway in the NEM

To demonstrate how the framework is used, we have applied it to a selection of current rules and reforms in the market. Through this, we can show the benefits of using the framework to deliver a structured analytical approach to assessing the congruency of multiple market reforms, as well as provide insights into the complex regulatory environment.

In total, 23 rules and reforms were selected, spanning across various issues within the NEM. From this, we were able to construct a holistic picture of the various interactions between reforms, highlighting the complexity of the current regulatory landscape and raising questions around congruency and coordination.

Figure 3 outlines these interactions at a high-level, while Section 4 sets out our findings in detail and Appendix B contains details on individual assessment and scoring. Observations from our analysis are set out below:

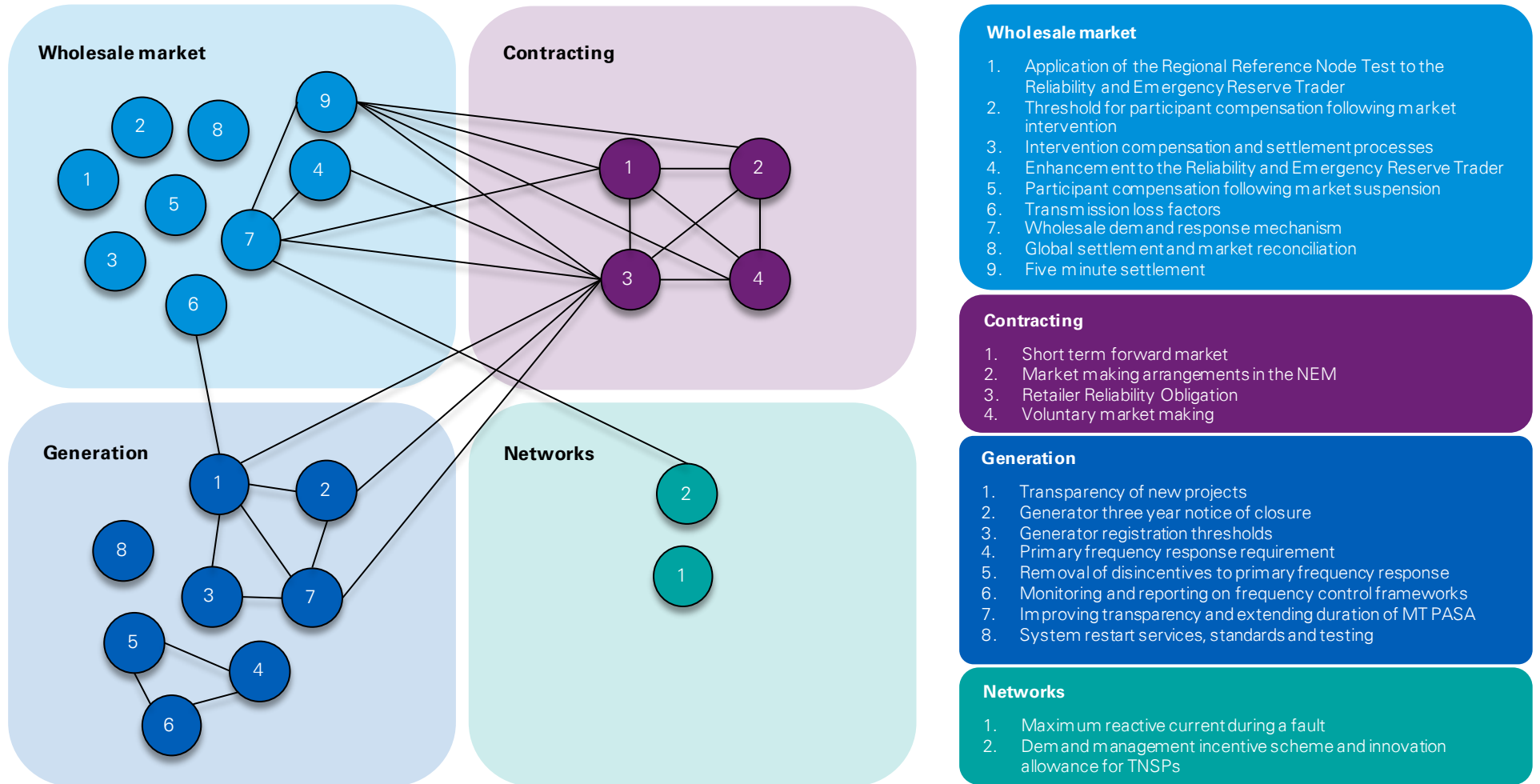
- There were a large number of similar outcomes and objectives between reforms in the contracting market, with multiple proposals aiming to increase contract market liquidity. The contract market is particularly complex, with small changes potentially having a disproportionate negative impact on efficiency. Our analysis flagged questions around how these reforms would work together in practice and whether there could be inefficiencies from duplication if all proposals were implemented.
- Five minute settlements, which is due to be implemented on 1 July 2021, could have outcomes that impact a large number of other reforms given the magnitude of this change to settlement

processes. The alignment of current and potential future reforms with five minute settlements requires careful consideration by decision makers.

- Changes to generator registration thresholds will have a broad impact that will require consideration of costs and benefits of reforms on newly obligated generators.
- The large number of reforms aimed at increasing transparency for generators are closely related to each other but appear to deliver unique and complementary benefits, raising no immediate questions regarding their congruency. In fact, many of the reforms appear to have been designed to harmonise with other reforms in the market (e.g. aligning timeframes between the Medium-Term Projected Assessment of System Adequacy (MT PASA), generator notice of closure, and Retailer Reliability Obligation (RRO)). This highlights the benefits of a coordinated approach to implementing reforms in the NEM.

Overall, our analysis found there appears to be a challenge in aligning reforms being implemented over different time periods. For example, the yet to be implemented five minute settlements or the proposed wholesale demand response mechanism will have broad market impact, which are not fully known at this stage.

Figure 3: Interactions between reforms assessed in this report



External factors

Rule changes and reviews undertaken by the market institutions are not the only factors that influence market outcomes. There are a number of external factors outside of the NEM that can also influence outcomes but have not been accounted for in how we applied the framework, as these are outside the scope of this report. These impacts are set out below and Section 5:

- **Gas markets**, including rule changes and policies being implemented by the federal and state governments. For example, policies that enable or detract from the supply of gas into domestic markets will impact gas generators' costs and therefore wholesale prices in the NEM.
- **Retail market** rule changes and policies being implemented by the federal and state governments. Retail market reforms, such as default market offers (DMOs), could influence outcomes in the wholesale market and contract market.
- **Transmission infrastructure upgrades** and funding, such as Marinus Link and the South Australia to New South Wales interconnector. Network investments will have an impact on the supply and demand balance in the NEM, influencing generation investment and wholesale prices.
- **Government policies** and subsidies for renewable energy and dispatchable capacity at the state and federal levels can have an impact on outcomes in the wholesale market and contract market.

It is important for policy makers to understand these external factors when assessing the costs and benefits of groups of reforms. There could be greater commentary in reports assessing new reforms on how such external factors have been taken into account.

Extending the framework to large-scale reforms

Our assessment has focussed on rule changes and reforms that represent incremental changes to the market, however, there are large-scale reforms underway that could supersede many of these changes. One of these reforms is COGATI (progressed by the AEMC) which is a reform to introduce nodal pricing in place of regional pricing in order to better align generation and transmission investment incentives. Section 6 has a high-level assessment of COGATI using the framework, along with insights into its interaction with NEM2025.⁴

Through extending our framework to include COGATI, a number of interactions and questions regarding congruency were raised. Some examples include:

- How five minute settlements and aspects relating to the implementation of COGATI would work together in practice;
- Whether rule changes relating to marginal loss factors and intra-regional settlement residues should be paused until a decision on any reforms related to COGATI have been made; and
- How the implementation of nodal pricing under COGATI would affect the contract market and the compatibility with proposed reforms seeking to increase contract market liquidity.

The extent of the interactions COGATI has on reforms being considered highlights the need for holistic analysis. Failure to understand the links between these reforms could risk market inefficiencies that result in higher prices for consumers. Looking externally, COGATI will affect how retailers contract under a nodal pricing system and it is not clear whether this change in behaviour has been contemplated under the new retail price regulation mechanisms. The alignment of COGATI with AEMO's Integrated System Plan also needs to be considered.

Another large-scale reform underway is NEM2025 (progressed by the ESB), which looks to assess whether the current market design is fit-for-purpose or should be replaced by an alternative design.

⁴ This analysis assumes that the COGATI model in the Directions Paper is implemented.

Progressing COGATI alongside NEM2025, both of which could fundamentally change the function of the NEM, will require careful coordination and planning in order to ensure efficient outcomes for consumers. We understand AEMC staff are members of the NEM2025 working group and these organisations are aware of the need to work together closely.

Key takeaways

Well-coordinated policy reform in the NEM is essential to promote market efficiency, provide certainty to investors and promote the long-term interests of consumers. The development and application of our framework tool has highlighted several key lessons to be considered in future analysis, which are set out below:

1) Caution when assessing multiple reforms attempting to solve the same issue

It is important that reforms are implemented and evaluated before implementation of similar or related reforms that may materially impact the outcomes. Failure to assess outcomes from a single reform before introducing new ones could result in inefficiencies through higher costs, redundant benefits, and unnecessary complexity.

2) Assessments should consider a wider scope of potential impacts

Given the large number of reforms being proposed, it is becoming increasingly important to consider the wider impacts of a reform and potential overlaps. Understanding the first and second order implications is an important first step to not only avoiding conflict with other changes, but being in a position to identify and reinforce any benefits.

Holistic analysis, using the framework tool in this report, and quantitative cost benefit analysis with consistent methodologies, will identify opportunities to reduce inefficiencies and promote combinations of reforms in the long-term interest of consumers.

3) External factors need to be assessed when evaluating rule changes

While there are a number of changes underway within the NEM that have been assessed in this report, there are also external factors that can have a material impact on the market, including renewable energy and gas policies, transmission upgrades, and retail markets. It is essential that this context is considered when assessing reforms to the NEM, and similarly, parties implementing external policies acknowledging potential impacts on NEM outcomes.

4) Governance arrangements should deliver complementary reforms

Unclear governance arrangements confuse responsibility and accountability. Where multiple energy market institutions and governments are undertaking major reviews of the NEM, and/or implementing policies, the task of promoting congruent policies in the long term interests of consumers is made more challenging. It is important to ensure there are clear lines of responsibility and the relevant organisations are held accountable, as this will ensure consistency in analysis and the best chance of coordinated reforms being introduced.

In addition, there could be increased transparency of how the various decision makers are collectively considering the complementary nature of all the reforms. For example, an annual statement jointly issued by the energy market institutions on how the NEO has been promoted under the package of reforms made in the past 12 months could help provide confidence on the robustness of the reform process to stakeholders. This could also evaluate the overall costs imposed to the industry as a result of multiple reforms and consider the overall capacity for industry to implement these packages.

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1 Introduction

1.1 A complex energy landscape

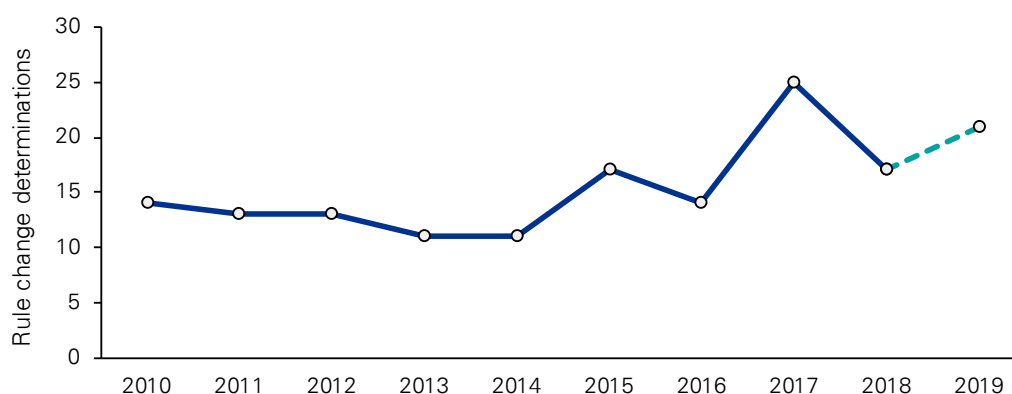
The Australian energy landscape has experienced rapid change in recent years. Government policies and declining technology costs have resulted in a large volume of variable renewable generation entering the National Electricity Market (NEM) over a short period.

The market share of renewable electricity generation in the NEM grew 25% from 2017 to 2018, and now makes up 21% of total electricity generation, or 45,823 GWh in total.⁵ On the demand side, a rapid increase in residential rooftop solar (with 1.55 GW added in 2018 alone)⁶ has suppressed net demand during the day, leading to a prominent valley in the daily demand profile, known as a “duck curve”. The duck curve will likely require new investment in flexible resources that can ramp down during the day and ramp-up quickly to meet the evening peak when solar output decreases.

As the complexity of the electricity grid has increased, so too has the consumer price of electricity on in the NEM. According to the Australian Competition & Consumer Commission (ACCC) in their Retail Electricity Pricing Inquiry⁷, retail electricity bills in the NEM rose by more than 35% from 2008 to 2018, and there has been a heightened level of focus on the sector from the public, industry participants, and governments as a result.

In response to these challenges, there has been a spike in the number of proposed changes to the market in order to deal with a myriad of perceived issues, including system security, reliability, transparency, flexibility, and arguably most notably, price. Changes to the electricity market are primarily made through the National Electricity Rules (NER), and are reviewed and implemented by the Australian Energy Market Commission (AEMC). The AEMC made a final determination on 13 rule requests in 2014 relating to the electricity market, while in 2017 this jumped to 25 requests. 2019 has seen similarly high figures, with the AEMC having already determined 6 rule change requests with another 15 currently under consideration. This trend is highlighted below in Figure 4.

Figure 4: Rule change determinations per year since 2010 from AEMC



⁵ Department of Energy & Environment, *Australian Energy Statistics – Table O: Electricity generation by fuel type 2017-18 and 2018 (2019)*

⁶ Clean Energy Council, *Clean Energy Australia Report 2019 (2019)*

⁷ ACCC, *Restoring electricity affordability and Australia’s competitive advantage – Retail Electricity Pricing Inquiry (June 2018)*

While the AEMC to progress changes to the NER and undertake reviews, the formation of the Energy Security Board (ESB) has resulted in a dispersion of market reform responsibility. There is also an increasing level of activity and focus from federal and state governments on electricity policy development,⁸ and the Australian Energy Market Operator (AEMO) and Australian Energy Regulator (AER) are playing more active roles in reform processes.

1.2 Wholesale electricity market design principles

In 2018, KPMG was asked by the Australian Energy Council (AEC) to provide advice on long-term market design principles that support a sustainable energy future for Australia and allow the assessment of potential market design changes.⁹ The wholesale electricity market design principles developed for the AEC are set out in Table 1.

While these principles provided a foundation through which to assess individual reforms, little work has been done to develop a framework to assess how the myriad of proposed and recently implemented changes interact with each other. While two reforms may appear to support the National Electricity Objective (NEO), if they provide redundant benefits or send conflicting market signals, in combination they may reduce market efficiency and increase costs to consumers.

Table 2: Wholesale electricity market design principles

Proposed wholesale electricity market design principles		
Principle 1	Competition and market signals	Markets where participants respond to market signals in a competitive environment tend to promote better outcomes for consumers than centralised planning.
Principle 2	Risk allocation	Markets that allocate risk, costs, and accountability for decisions to those best placed to manage them promote efficient outcomes.
Principle 3	Competitive neutrality	Markets that are technology neutral and do not favour one technology or business model over another encourage consumer needs to be met at the lowest cost and promote innovation.
Principle 4	Clear and consistent rules	Markets that are durable across a range of credible future scenarios, and establish a clear and consistent set of rules, provide participants with the confidence to make decisions.
Principle 5	Information asymmetries	Information asymmetries should be minimised so market participants have confidence they are competing on a level playing field.
Principle 6	Cross-market integration	Costs to consumers will be minimised when markets complimentary to energy, such as ancillary services and emissions, are designed in a way that is consistent with the price discovery mechanism in the electricity market.

1.3 Scope and purpose of the report

In light of this identified area of future work and the broad changes being made to the regulatory landscape, the AEC has asked KPMG to develop a framework tool to assess how well various reforms underway in the NEM work together.

The AEC’s aims for the project are as follows:

⁸ For example: the Default Market Offer, Victorian Default Market Offer, Underwriting New Generation Investment program, and various state-based grant or subsidy programs.

⁹ KPMG, *Electricity Market Design Principles* (2018)

- Develop a framework that can be used to assess how well energy market reforms work together, which can be easily used by policy decision-makers and interested stakeholders.
- Apply the framework to a selection of current (proposed and under consultation) market reforms and rule changes and flag potential questions that warrant further investigation.
- Understand how, and to what extent, external factors and the governance framework influences the level of integration or congruency between reforms.
- Articulate how the outcomes from the assessment framework are likely to impact upcoming significant market reforms, including the Post 2025 Market Design for the NEM (NEM2025) and the Coordination of Generation and Transmission Investment (COGATI).

In this report, KPMG has outlined a framework tool which has been developed for the AEC's purposes. At its core, this framework aims to provide a neutral and objective lens to analyse how various reforms in the market work together and interact with each other. However, given this report also applies the framework to current rules and reforms in the NEM, inevitably some judgement is required in this step, and we recognise that others may reach a different assessment. We encourage any party using the framework to consider it as a guide on the approach to take towards holistic analysis of electricity market reform, rather than a definitive commentary on specific reforms.

This report focuses on rule changes and reforms directly related to the wholesale electricity market in the NEM that are either underway or have yet to be implemented.¹⁰ While the NEM is intrinsically linked with external factors such as government policy on emissions reductions, government positions on natural gas development, and generation and transmission subsidies, these have not been analysed directly under the framework as agreed in the scope of work. Rather, these external issues have been considered outside of the framework as outside influences to the market. Similarly, this report is focussed on the NEM and as a result does not focus on outcomes in other electricity markets such as the Wholesale Electricity Market (WEM) in Western Australia.

The framework is intended to be used by policy makers, stakeholders or rule change proponents in order to aid with decisions and general thinking on potential rule changes and reforms to be introduced to the market. All rule changes should deeply consider the context of the market they are intending to alter, else they risk inefficiencies and additional costs to consumers.

While the report and framework are designed to identify areas of concern or future investigation, the scope of this report does not include in-depth evaluation of the potential *causes* of any inconsistency or lack of coordination in electricity market reform nor does it explore in detail how best to manage or resolve such issues. Rather, this serves as a tool for future discussion between various parties on how to best resolve these issues of congruency and overall coordination moving forward.

What the framework does not do

It is important to note that the framework does not evaluate whether an individual reform has merit, but rather how reforms work alongside other reforms in the market. As such, the framework is designed to raise questions for further investigation around how reforms work together, and consideration within a package of reforms rather than individually.

1.4 Our approach to the task

KPMG developed a coordination framework in consultation with the AEC and its members that can be used to assess the congruency of past, current and future reforms. The report is structured as shown:

¹⁰ As of 31 July 2019. The exact selection of rule changes and reforms considered has been developed based on a set of criteria as detailed in the report.

- **Chapter 2:** Provides an overview of the current state of reform, including external factors influencing these issues.
- **Chapter 3:** Establishes the assessment framework and provides detail on the methodology.
- **Chapter 4:** Applies the assessment framework to selected current rule changes and reforms in the NEM wholesale market, providing assessments and analysis on the various reforms.
- **Chapter 5:** Provides further analysis on the influence of external factors on the assessed rule changes and reforms, highlighting any further congruency issues.
- **Chapter 6:** Applies the framework to a major reform package under consultation (COGATI), with subsequent discussion on its interaction with another large reform package underway (NEM2025).

There are also two appendices to the report:

- **Appendix A:** Sets out the selection criteria for which rule changes and reforms to include in our analysis, along with a detailed overview of the selected reforms.
- **Appendix B:** Provides a brief explanation and justification for the assessments of the rule changes and reforms.

1.5 Key terms

ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASX	Australian Stock Exchange
CET	Clean Energy Target
COAG	Council of Australian Governments
COGATI	Coordination of Generation and Transmission Investment
DMIA/DMIS	Demand Management Innovation Allowance/Incentive Scheme
DNSP	Distribution Network Service Provider
DR	Demand response
DRM	Demand response mechanism
DRSP	Demand response service provider
EEP	Emerging Energy Program (NSW)
ENA	Energy Networks Australia
ESB	Energy Security Board
FCAS	Frequency control and ancillary services
IRSR	Intra-regional settlement residue
ISP	Integrated System Plan
MLF	Marginal Loss Factors
MLO	Market Liquidity Obligation
MSPS	Market Suspension Pricing Schedule
MT PASA	Medium Term Project Assessment of System Adequacy
NEG	National Energy Guarantee
NEM	National Electricity Market
NEM2025	Post-2025 Market Design for the National Electricity Market

NEO	National Electricity Objective
NER	National Electricity Rules
QRET	Queensland Renewable Energy Target
RERT	Reliability and Emergency Reserve Trader
REZ	Renewable Energy Zone
RRN	Regional reference node
RRO	Retailer Reliability Obligation
RIT-T	Regulatory Investment Test for Transmission
RRP	Regional Reference Price
SRAS	System Restart Ancillary Services
STFM	Short Term Forward Market
TNSP	Transmission Network Service Providers
TUOS	Transmission Use of Service
UFE	Unaccounted-for energy
UNGI	Underwriting New Generation Investment
VRET	Victorian Renewable Energy Target

2 Current situation

2.1 Understanding the problem

Rapidly evolving market conditions in the Australian energy sector has caused an increase in rule changes and reforms as policy makers and regulators attempt to keep pace with emerging issues.

System security arose as a predominant issue in the NEM following the introduction of large amounts of renewable energy in the grid, and as a result, the number of market intervention events by AEMO has increased. In the last two years, the number of directions¹¹ has increased from less than ten in 2016, to 29 in 2017 and over 163 in 2018, with the most directions being made to generators in South Australia.¹² While this type of market operation was typically seen as a 'last resort', it is becoming more prevalent in order to maintain security.

In September 2016, South Australia experienced a widespread power outage due to storm damage to electricity transmission infrastructure. Similar events, albeit smaller, occurred in December 2016 and February 2017. Following this, the Council of Australian Governments (COAG) Energy Council commissioned the Finkel Review in October 2016 to provide advice to governments on a coordinated national reform blueprint. Of the 50 recommendations, 49 were agreed on by energy ministers and an actionable timeline was outlined.

The Finkel Review sparked subsequent reviews, rule changes, reforms and proposed mechanisms, most notably:

Energy Security Board formation

- A new market body was established and charged with implementing recommendations of the Finkel Review, and providing whole-of-system oversight to the Energy Council on energy security and reliability in the NEM. To date, they have:
 - put forward a number of rule-change requests to the AEMC;
 - provided annual reviews on the health of the NEM; and
 - provided input on national climate policy, the National Energy Guarantee (NEG).

National Energy Guarantee

- The NEG was proposed in replacement of the Finkel-recommended Clean Energy Target (CET). The aim of the NEG was to deliver system security, reduced emissions and lower electricity prices. Importantly, the NEG would also deliver firm climate policy and provide investment certainty. While the emissions reduction component of the NEG was discontinued, the Retailer Reliability Obligation (RRO) is still being progressed.

¹¹ Directions are issued by AEMO in response to concerns over grid reliability or security, and require registered participants to take action in relation to a scheduled plant or market generating unit. Please refer to the National Electricity Rules clause 4.8.9 and 4.8.9A.

¹² AEMO, *Electricity rule change proposal: Alignment of intervention compensation and settlement timetables* (2019)

Reliability Frameworks and System Security reviews

- In July 2016, the AEMC self-initiated a review to address the management of frequency and system strength due to reduced levels of synchronous generation.
- From this review, three rule change requests were made; “Managing the rate of change of power system frequency”¹³, “Managing power system fault levels”¹⁴ and, “Inertia ancillary service market”.¹⁵

Retail Electricity Pricing Inquiry

- Finkel recommended the ACCC undertake an inquiry into the transparency of electricity retail pricing. The final report was published in June 2018 and made 56 recommendations for the electricity generation, network and retail markets.

2.1.1 Governance between several proponents

The Finkel Review was a catalyst for change and a contributor to the majority of the rule changes and reforms. Given the breadth of scope involved in improving the performance of the NEM, a number of government bodies have been involved in progressing the Finkel recommendations. However, the widening spread of responsibility raises questions regarding direction for, and governance of, energy market reform.

Most importantly, the Finkel Review led to the introduction of the ESB, which represented the most significant change to Australia’s energy market governance framework since the energy market institutions were formed under the Australian Energy Market Agreement in 2004.¹⁶ In line with recommendations from the Finkel Review, a new ministerial rule-making power was introduced, so that where the COAG Energy Council is unanimous in its support for an ESB recommendation, the change can be implemented without being considered by the AEMC.¹⁷

Given the AEMC previously had the sole responsibility for changes to the NER and market reviews, this represents a significant shift in accountability for energy market reform. Additionally, federal and state governments have become more active in energy market development, progressing policy changes or subsidy programs that have (or may have) direct or indirect impacts on the efficiency operation of the NEM. These include default market offer (DMO) pricing, Underwriting New Generation Investment (UNGI) program, and various state-based schemes aimed at incentivising a range of different types of generation.

This shared responsibility of governance presents a growing challenge to the various reform packages underway in two ways:

- **Coordination:** To minimise cost and complexity, it is important for all institutions to identify and evaluate the multiple interactions and interdependencies of reforms being considered, and provide a coherent and consistent reform pathway. Given the increasing speed of change, the possibility of multiple policy bodies evaluating the same issue from different perspectives and forming different conclusions creates further policy uncertainty for industry.
- **Accountability:** With multiple organisations now responsible or becoming active in developing and implementing reforms, it is less clear who is accountable when there is a failure in the market. For example, a load shedding event could be due to state or federal government

¹³ AEMC, *Rule Determination: National Electricity Amendment (Managing the rate of change of power system frequency) Rule 2017* (2017)

¹⁴ AEMC, *Rule Determination: National Electricity Amendment (Managing power system fault levels) Rule 2017* (2017)

¹⁵ AEMC, *Rule Determination: National Electricity Amendment (Inertia Ancillary Service Market) Rule 2017* (2017)

¹⁶ *Australian Energy Market Agreement (amended 9 December 2013)*

¹⁷ COAG Energy Council, *Bulletin – Energy Security Board: Ministerial power to make rules* (2017)

subsidies, inappropriate system security rules or a delay in implementing recommendations from the Finkel Review, each of which are governed by different parties.

Any organisation or person can submit a rule change to the AEMC for its consideration. While this provides a single point of judgement that should promote congruency between reforms, the increasing number of reforms being considered, and increasing complexity of the governance arrangements, highlights the need to understand the interactions between reforms at a holistic level and ensure that these impacts are properly assessed during the rule change process.

As well as this, the AEMC is tasked with progressing and deciding on any rule change requests submitted to it. While the AEMC can self-initiate reviews, they do not have the power to initiate rule change requests. As such, the influx of rule changes is controlled by parties external to the decision maker, which makes it important for the AEMC to consider congruency during its assessments.

2.1.2 Importance of congruent policy and regulation

Wholesale electricity market rules can have a material impact on the efficiency of the electricity sector, as they provide the boundaries within which market participants make long term investment and short term operational decisions. As such, it is important for market participants that these rules work harmoniously together, or in other words, are congruent with each other.

While the definition is broad, congruent reforms typically:

- reinforce market signals to participants;
- allocate risks efficiently and consistently to parties best placed to manage them; and
- deliver unique and complementary benefits to the market and its participants.

Congruent reforms require careful thought by decision-makers and a holistic view on the impacts on consumers. We also note that reforms congruent with each other are in the long term interests of consumers and therefore promote the National Electricity Objective (NEO).¹⁸

Reforms lacking congruency may create unforeseen changes to incentives that result in perverse outcomes, conflicting market signals that deter investment, and unnecessary costs and complexities that can erode the benefits of the reforms. A lack of congruency and coordination can also lead to redundant reforms being implemented in the market that are seeking to solve the same problem or solving a problem which does not materially exist. This can often lead to worse outcomes for consumers and the market than the problem itself.

Large-scale reforms in the NEM

Ensuring the current policy development process delivers congruent rule changes is also imperative for large upcoming reform packages – namely the COGATI review and NEM2025 process.

COGATI, which is being progressed by the AEMC, is seeking to reform a broad section of the wholesale market – generation and networks. The objective is to optimise how generators use transmission infrastructure and also seek to understand how transmission businesses recover the costs of building and maintaining their infrastructure. Given this breadth, COGATI could potentially create conflicts (or alternatively, efficiency gains) with current reforms and rule changes underway.

Regarding the NEM2025 process, the ESB has been tasked with developing advice on a long-term, fit-for-purpose market framework to support reliability that could apply from the mid-2020s. This is a far-reaching process that considers the suitability of the market design from the ground up. As such,

¹⁸ The NEO is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to the reliability, safety and security of the national electricity system.

outcomes from this process could fundamentally alter the function of the electricity market and interact with all parts of the electricity supply chain, including recently completed rule changes.

Large-scale reforms such as these have the potential to supersede current reforms or market frameworks in the NEM, or make them redundant through duplication of benefits or solving issues that were previously targeted. As such, it is crucial to understand from an overarching viewpoint how these large-scale reforms will fit together and within the current market design.

2.2 Internal and external market factors

The NEM is inherently complex, with a varying degree of influence between different elements. As such, considering the congruency of the reforms underway in the NEM becomes a complex exercise, as all changes implicitly impact upon all other changes and elements of the market.

For this reason, it is important to distinguish between factors that can be deemed as “internal” to the operation of the NEM, and those which are “external”. Although the NEM is fundamentally and intrinsically linked across all factors (such as gas and retail markets), the scope of this report is to focus on the NEM wholesale market.

Internal factors relate primarily to the physical and financial supply chain of electricity in the market (up to the point of purchase from the spot market). On the physical side of things, this can be split into generators and networks, while the financial supply chain can be broken down broadly into wholesale markets and contracting markets.

A detailed breakdown of factors in the NEM is provided in Figure 5.

2.2.1 External factors

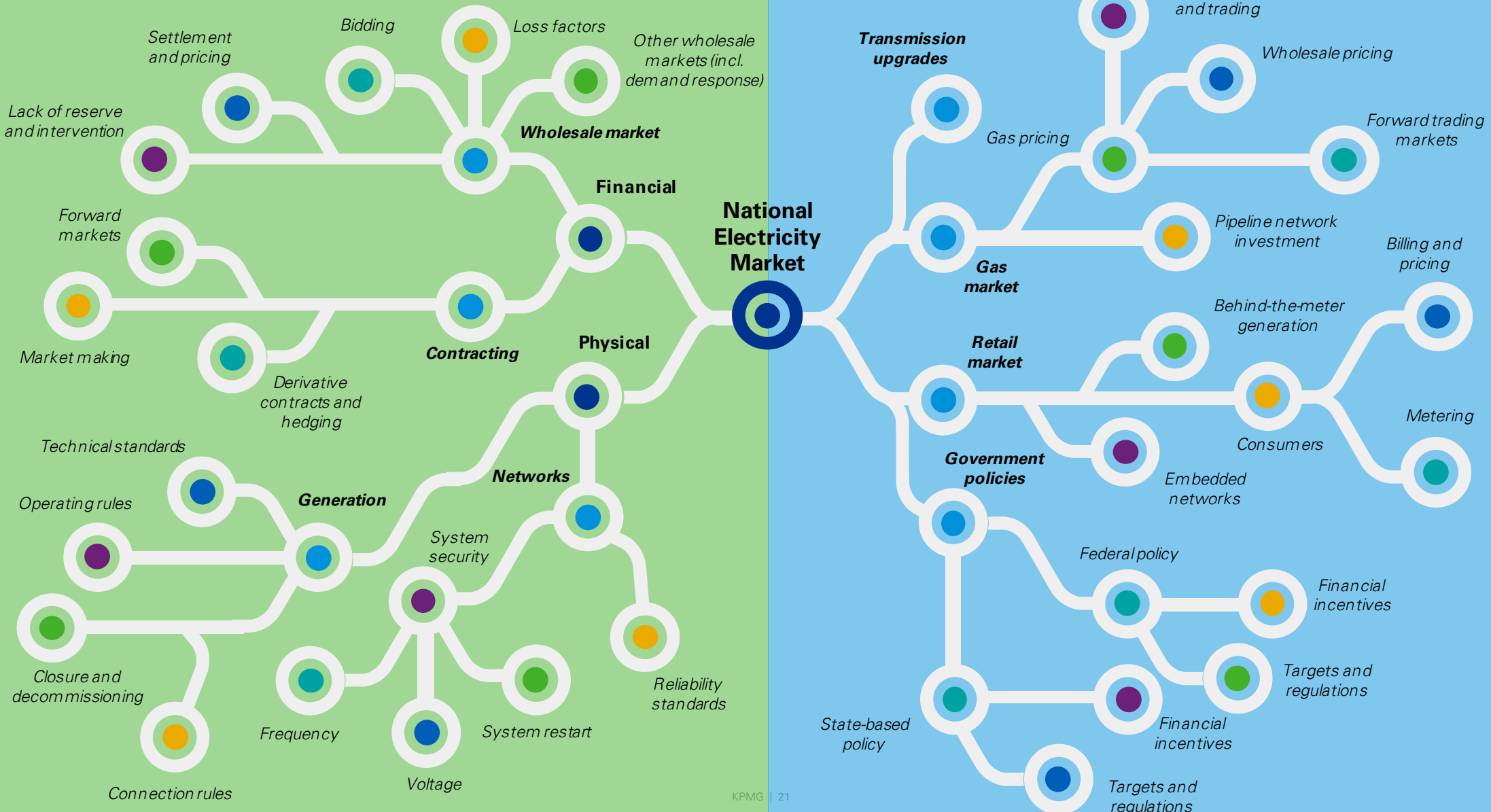
The “external” factors will be discussed qualitatively outside of the framework and to inform our thinking around overlaps of rules and reforms. As per Figure 5, the following categories of external factors have been determined the most relevant to energy market reform:

- **Gas market:** The wholesale market is influenced by the price and accessibility of gas given it is a key fuel type for electricity generation. There are a number of reforms and interventions occurring in the Australian gas market that may have an indirect impact to the wholesale market, particularly fuel pricing.
- **Retail market:** Reforms and interventions in the retail market, such as pricing and metering, can influence outcomes for consumers and change incentives along the supply chain.
- **Transmission upgrades:** Reforms that result in changes to the capacity of interconnectors will be likely to influence wholesale market pricing and outcomes. While we have included network reform rule changes in our assessment, in this report we have not assessed the impact of government policies to support the development of new interconnectors.
- **Federal government policies:** Policies such as the NEG or UNGI can influence market signals which has flow on impacts to investment in energy infrastructure, the uptake of certain technology, and costs of environmental levies among many others.
- **State government policies:** Similarly, state-level incentives, investments, and targets can influence the development of the NEM within each specific region. Given the increasing focus on state governments on incentivising renewable energy uptake, the impact and flow-on effects to current market reforms is important to understand.

Internal

External

Figure 5: Internal and external factors in the NEM



3 Coordination framework

3.1 Overview of the framework

Objectives

Our broad aim with this analysis is to develop a framework in order to better understand the complexity of the energy policy landscape through looking into how well the rules and reforms currently under consideration work together. This framework is applicable not only to the current state of the market, but also able to be used to assess future reforms.

An outcome from applying the framework is to demonstrate the need for coordination and alignment between reforms as a whole rather than individually, prompting more thorough analysis on the interactions and flow-on effects of each change to the market. This framework cannot answer all questions and conclusions with regards to the level of integration of reforms in the NEM, but is there to provide a starting point for a conversation and debate.

We would expect the framework tool can be used in various scenarios by decision makers or proponents of reforms or rule changes in order to provide a sensible and credible assessment of congruency. This would include the AEMC, as well as other market bodies such as the ESB, AEMO, and AER. Additionally, given the large impact that external drivers can have upon the NEM, such as renewable energy policies and natural gas policies, it is important that bodies such as industry groups and governments are cognisant of this framework and the impact that various programs could have on the NEM.

While all assessments of rule changes and reforms are inherently qualitative (without access to more robust modelling tools), the framework can provide a guide on how to think about interactions between rule changes, and a step-by-step tool on important questions that should be asked during the evaluation process.

Goals

To achieve this overarching objective, there are a number of goals that the framework aims to meet:

- The framework should be comprehensive enough so that it can accurately capture interactions between connected reforms in the market.
- The framework needs to be able to be easily applied in order to reduce complexity for users.
- The current state of the market should be able to be assessed using the framework in addition to future reforms that may arise.
- The framework should be able to identify questions regarding specific reforms and their congruency in the NEM in order to promote further discussion on specific issues.

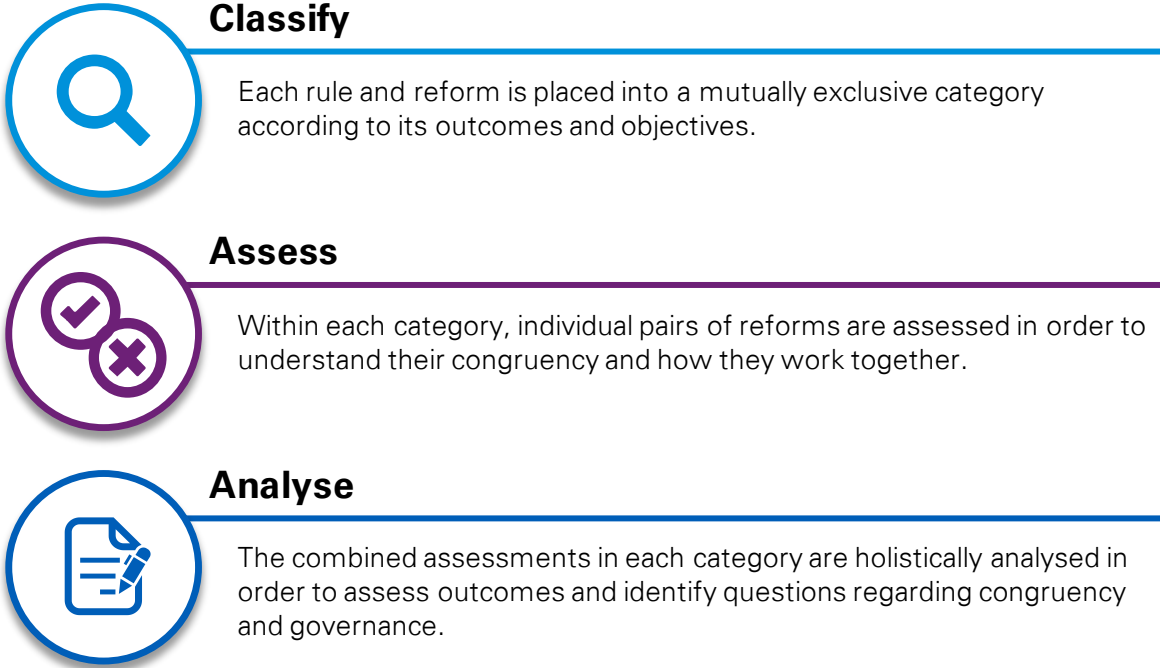
Approach

In order to make an assessment on the congruency of electricity market reforms, KPMG's framework uses a piecewise approach to build a picture of the regulatory landscape. After separating reforms into related categories, the framework methodically looks at individual interactions between related pairs of reforms. Assessing these individual interactions requires a structured analysis that considers

various factors concerning each reform pair, in order to form a view on how well they work together. These small pieces of analysis can then be combined into a holistic view on the congruency of current reforms across the market.

To achieve this approach, the framework is made up of three key steps, as outlined in Figure 6. Through undertaking a process to **classify, assess, and analyse**, interactions can be identified within the current market and the congruency of reforms can be assessed.

Figure 6: Overview of coordination framework approach



3.2 Step 1 – Classify

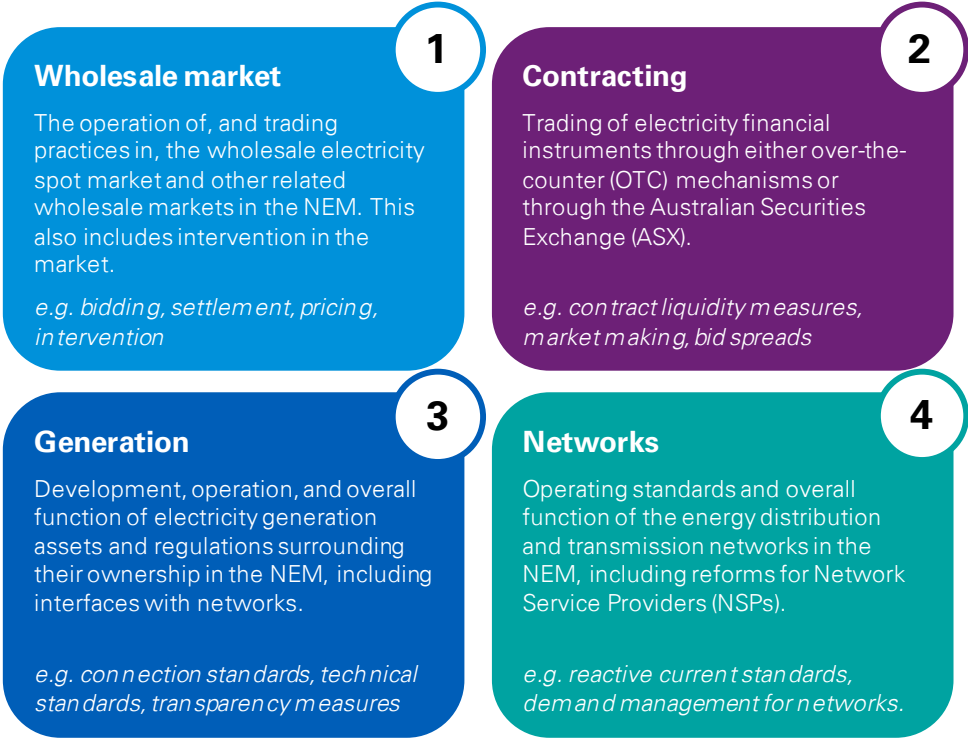
The first step of the coordination framework is to classify each reform according to a set of mutually exclusive categories. This step ensures that the assessment and consequent analysis is performed on a smaller subset of rules and reforms in order to reduce complexity.

The categories need to be defined in a way that is easily understandable and intuitive for users, but are also relatively mutually exclusive (initially). Reforms that sit under one category should ideally have no common outcomes with reforms under other categories. This step is an inherent trade-off in the framework between comprehensiveness and functionality. Assessing all reforms under one category would ensure that all potential cross-links are captured, but would make the assessment of a large number of reforms unwieldy. Alternatively, categorisation breaks the analysis into a more manageable size, but a user may miss links between reforms not under the same category.

The categories in the framework have been designed according to elements of NEM that the reform is predominately acting upon. It will be the discretion of the user as to which reform falls under which category, noting that there is room later in the analysis to place reforms across multiple categories if deemed necessary. However, the initial step should try to identify the category most impacted.

There are four categories identified within the NEM, as outlined in Figure 7.

Figure 7: Category definitions for assessment framework



3.3 Step 2 – Assess

Once the reforms have been placed into their respective categories, a detailed assessment is carried out whereby the interaction between each pair of reforms in the category is assessed in more detail. Through conducting this assessment across all pairs of reforms in the category, the congruency of the category as a whole can be determined.

3.3.1 Formation of matrix

In order to begin the assessment for a given category of reforms, we first construct a half-matrix of these reforms. An example of this is outlined in Figure 8. Note that our analysis does not depend on the order of reforms (i.e. A vs B or B vs A).

Figure 8: Initial half-matrix for reform assessments

	Reform A	Reform B	Reform C	Reform D	Reform E	Reform F
Reform A						
Reform B						
Reform C						
Reform D						
Reform E						
Reform F						

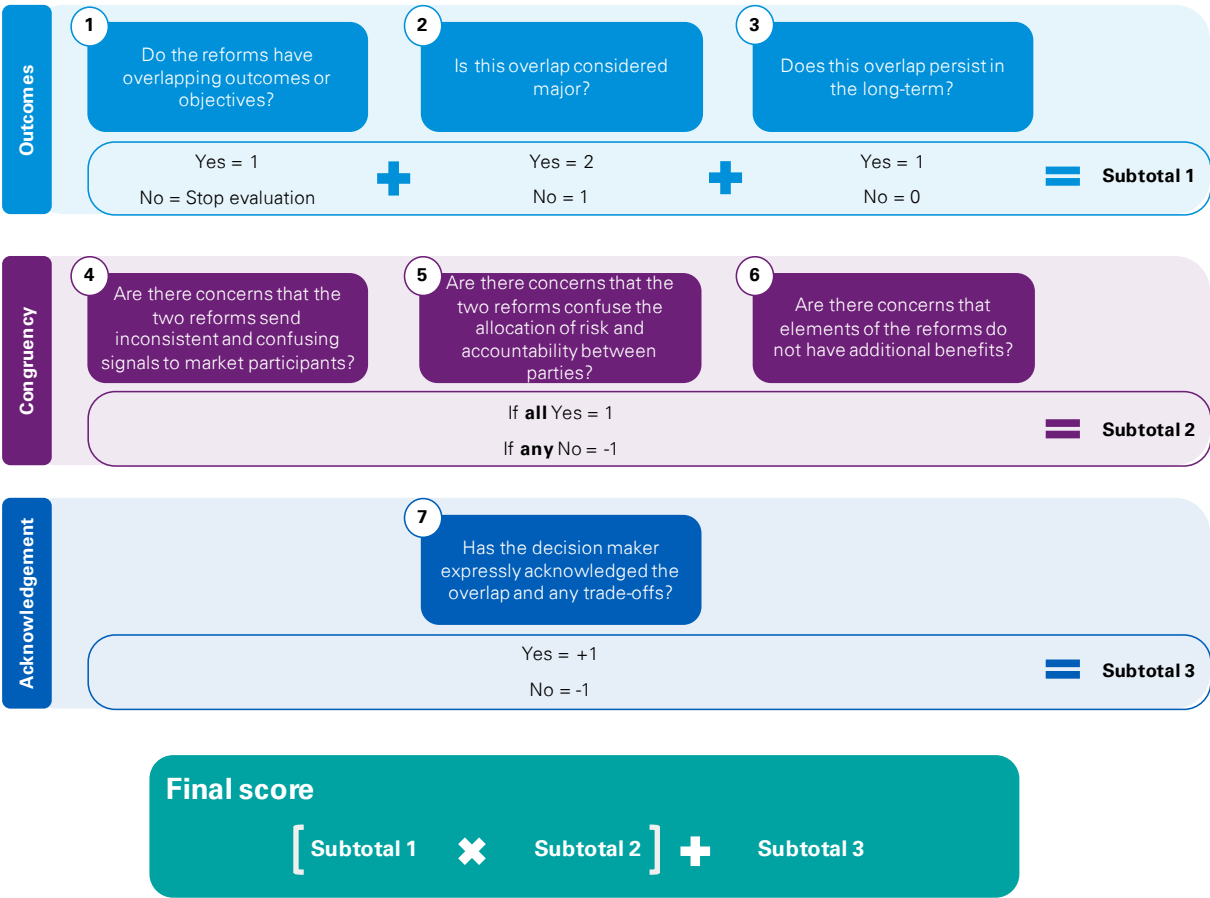
3.3.2 Assessment methodology

For each pair of reforms, a score is given based on a set of evaluation questions designed to discern how well the reforms work together. This assessment is conducted through a series of questions which can be split into three core areas:

- Extent of overlap in **outcomes** and objectives of the reforms.
- **Congruency** of the two reforms in practice.
- **Acknowledgment** of the interaction by the proponent or decision-maker of the reform.

An outline of the scoring methodology, including the assessment questions and scoring table is in Figure 9. A subtotal is calculated for each portion of the assessment (outcomes, congruency, and acknowledgement), which is then combined to give a total score for the pair of reforms.

Figure 9: Assessment scoring methodology and questions



Outcomes

We firstly look at the outcomes and objectives of the two reforms in order to understand to what extent the reforms deal with the same issue or bring about the same results in the market. Outcomes and objectives are defined in terms of the overall purpose of the reform – e.g. are they trying to achieve the same goal or solve the same market failure? Alternatively, the reforms may have secondary impacts in the market that conflict with each other. If we identify no overlapping outcomes or objectives (Question 1), we do not need to proceed with the assessment.

Where an overlap in outcomes exists, we then aim to understand whether it is deemed as major or minor (Question 2). While this is inevitably a subjective matter, key considerations in this

determination would include whether the reforms are attempting to implement the same mechanism or if the reforms do not deal with any other issues other than the overlapping aspect. A minor overlap would exist where secondary outcomes of a reform overlap, but where the primary function or objective of the reform is different.

Another key aspect of understanding the magnitude of overlap is its persistence in the long-term or short-term (Question 3). In this regard, we define long-term overlap as one which continually exists in the market (i.e. if both reforms are active at all times). Conversely, a short-term overlap would be one that is only triggered under certain conditions. A good example of a short-term overlap would be the RRO, which is only triggered under certain conditions.

In general, overlapping outcomes do not necessarily dictate whether the reforms do or do not work together. Reforms can have similar outcomes but are congruent in such a way that reinforces benefits to consumers. However, overlapping outcomes do increase the risk of the reforms conflicting in a negative way unless the interaction is properly understood by the decision maker.

Congruency

Once we have understood the extent to which the pair of reforms overlap in their outcomes, we then look at how well the reforms work together in order to understand whether this overlap is positive or negative. This assessment of congruency can be thought of in three parts, namely:

- the market signals that the reforms are sending to participants (Question 4);
- the allocation of risk and accountability between the two reforms (Question 5); and
- the additionality of the benefits introduced by both reforms (i.e. whether there are redundancies) (Question 6).

Reforms that reinforce each other will support the market signals they are providing to participants, allocate risk in a consistent fashion, and introduce unique benefits to the market. If a pair of reforms can demonstrate these aspects, this would indicate that the pair of reforms work together and do not raise questions around congruency. We would note that this is a positive overlap.

On the other hand, if questions are raised around the ability for the two reforms to work together with reference to the above points, the pair of reforms are flagged as potentially having a negative overlap in the market and warrant further investigation.

Acknowledgement of overlap

Finally, an assessment is made on whether or not the potential overlap (if any) has been acknowledged by the decision maker, regardless of whether it is positive or negative (Question 7).

If the decision maker has made explicit reference with regards to the interaction between the two reforms, there is a much better chance that any costs and benefits between the two reforms will be considered as the rule change or reform is progressed. Acknowledgment should include some consideration around how the reforms work together, either during the design or implementation phase.

If there is a positive overlap that has been identified by the decision maker, there is a greater chance that this positive interaction will be maintained or strengthened in the final design of the two reforms. Conversely, failure to acknowledge potential overlap between reforms means that positive interactions may be neglected or questionable pairs of reforms are implemented within the market.

3.3.3 Outcomes from scoring

Using this scoring methodology, pairs of reforms are graded on a scale from -5 to +5. A score of zero is only achievable if the answer to the first question is "No" (at which point the evaluation is stopped).

A pair of reforms with a negative score implies that the reforms overlap in their outcomes and objectives and there are questions around how well they work together. Similarly, a positive score implies that reforms overlap in outcomes and objectives and they potentially work well together. The intention of this scoring is to identify areas of investigation in the next step of the methodology; definitive conclusions around congruency will not be possible at this point.

Some sample pathways that give various scores are provided below in Table 3. These are only examples and does not describe every possible pathway available.

Table 3: Sample pathways to scoring outcomes from assessment

Score	Description
-5	Major overlaps in the long-term that raise issues with congruency and have not been acknowledged.
-4	Minor overlaps in the long-term that raise issues with congruency and have not been acknowledged.
-3	Major overlaps in the long-term that raise issues with congruency but have been acknowledged.
-2	Major overlaps in the short-term that raise issues with congruency but have been acknowledged.
-1	Minor overlaps in the short-term that raise issues with congruency but have been acknowledged.
0	
1	Minor overlaps in the short-term that are congruent but have not been acknowledged.
2	Major overlaps in the short-term that are congruent but have not been acknowledged.
3	Major overlaps in the long-term that are congruent but have not been acknowledged.
4	Minor overlaps in the long-term that are congruent and have been acknowledged.
5	Major overlaps in the long-term that are congruent and have been acknowledged.

3.3.4 Completion of matrix

Once the scores for each pair of reforms have been established, the half-matrix for each category can be completed. This will provide a result similar to Figure 10, which is used to inform the next stage of the framework. If the framework is being used to evaluate a single new reform, it will require the addition of another column and row to the existing half-matrix.

Figure 10: Sample of completed half-matrix from assessments

	Reform A	Reform B	Reform C	Reform D	Reform E	Reform F
Reform A		-4	-3	-4	0	0
Reform B			-2	0	4	0
Reform C				0	1	3
Reform D					2	0
Reform E						-1
Reform F						

3.3.5 Classifying reforms across multiple categories

During the course of the assessments, it may become apparent that a reform has impacts that span across multiple categories. In this situation, the user can include it across more than one category through adding an additional column on the right. Adding corresponding rows is not needed, as we only wish to evaluate the added reform against the existing reforms in that category.

The benefit of waiting until this stage of the assessment to put reforms in multiple categories is that the user is better acquainted with the evaluation methodology and is better informed as to whether a reform falls into multiple categories.

3.4 Step 3 – Analyse

Following the scoring of each pair of reforms within each of the four categories, it is important to then evaluate the results in order to more deeply understand why certain interactions exist between reforms. While the detail of the evaluation of each pair in this step of the assessment framework may differ depending on the user and context, we have provided general guidance regarding potential questions and lines of analysis that should be considered.

3.4.1 Detailed category analysis

For each category of reform, a detailed analysis can be made on the results that have been compiled from Step 2 of the framework. This will provide an overview of the congruency of the category as a whole (i.e. the number of linkages and common themes of congruency), as well as delve deeper into potential impacts on consumers and the role of governance between the various reforms. The qualitative analysis can be focused on reforms that demonstrate particularly strong interactions as identified in Step 2, in order to understand the drivers and determine whether there are common trends.

The detailed analysis can be adjusted according to the user's preferences and the context the framework is being used for. A list of possible lines of questioning are in Table 4, split into three categories. The intent of these questions is to delve into the detail around each overlapping pair of reforms and provide a better idea on potential remedies.

Table 4: Potential questions to guide detailed category analysis

Qualitative analysis
Overview <i>This section covers the general findings between the two reforms and why the reforms have been flagged.</i>
What overlapping outcomes or objectives are the reforms addressing and why is this the case?
What are the general themes and observations with respect to the congruency of the reforms in the category?
Impacts to consumers <i>This section covers how well the pair of reforms reflect the NEO, outlining costs and benefits to consumers.</i>
Do interacting reforms together promote efficiency in the long-term interest of consumers? (See “AEC Market Design Principles” report as a guide for the principles the reforms should follow in order to promote the NEO)
Are there concerns around the costs of associated reforms outweighing the benefits? Are there inefficient costs from implementing various pairs of reforms?
Governance <i>This section covers potential governance reasons underpinning the overlap.</i>
How are the reforms planning to be implemented, and do overlapping reforms span one or more government or market institutions?
Was there appropriate communication and/or coordination between the market institutions regarding the flagged pairs of reforms?

3.5 Single reform evaluation

While the above framework can be used to establish the current state of reforms in the market, adding an additional single reform to this framework will require significantly less work. The key steps can be outlined as follows:

Classify

- Categorise the reform into one of the four categories listed (wholesale market, contract market, generation, or networks) according to the part of the NEM most impacted by the reform.

Assess

- Add an additional row and column to the existing half-matrix for the chosen category.
- Conduct the assessment for the new reform against each existing reform in the category and record scores in the new matrix.
- Consider whether the reform should also be included in a separate category and perform the same analysis if necessary.

Analyse

- Provide a general analysis on the congruency of the new reform against the other reforms in the category as a whole.
- Record findings and lessons learned for improving the congruency of the new reform.

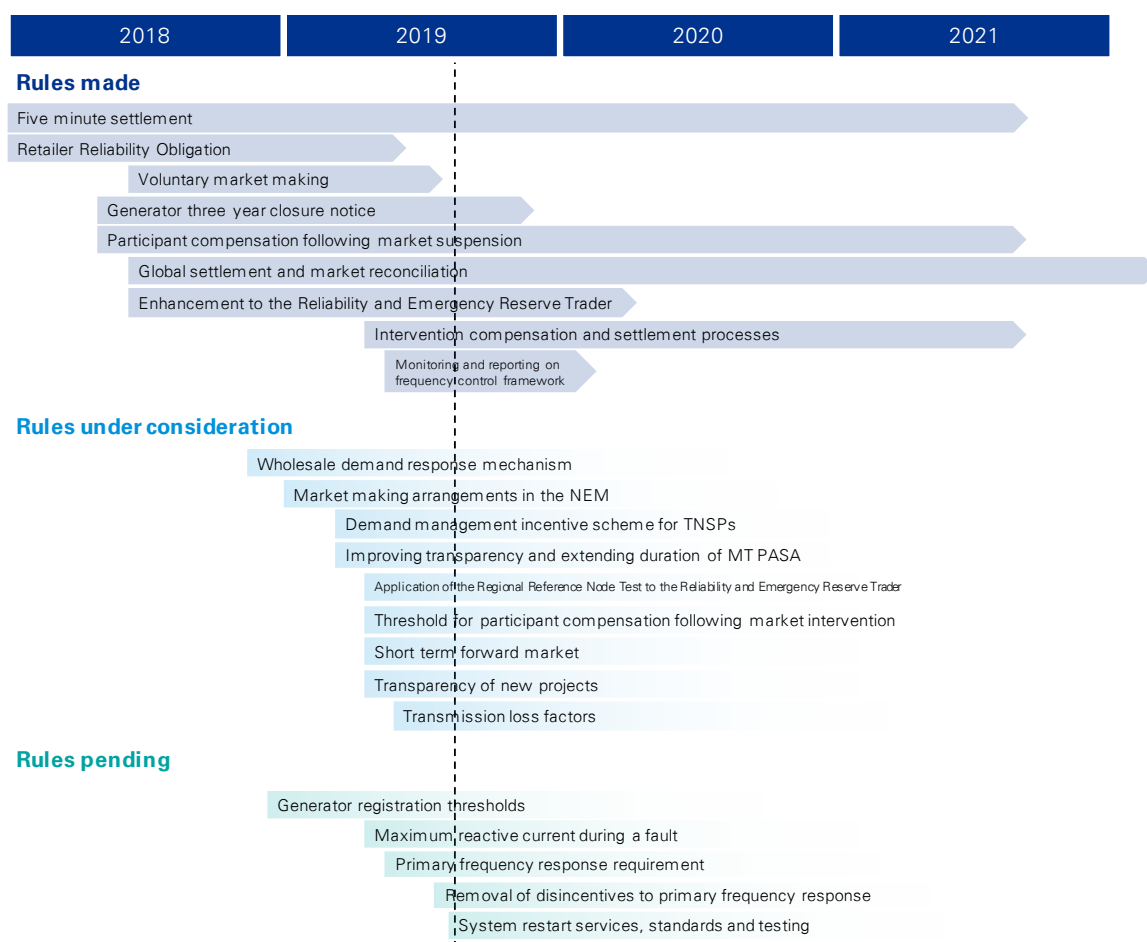
4 Application of the framework

To demonstrate how the framework is used, we have applied it to a selection of current rules and reforms in the market. Through this, we can show the benefits of using the framework to deliver a structured analytical approach to assessing the congruency of multiple market reforms, as well as provide insights into the complex regulatory environment.

4.1 Current market rules and reforms

The AEMC has 39 potential reforms across the electricity, gas, and retail market that are open or pending¹⁹, with several more that have been made and yet to commence. For our analysis, we have considered 23 of these reforms based on a set of selection criteria outlined in Appendix A, and focussing on internal factors to the electricity market as discussed in Section 2.2. An outline of these reforms is provided in Figure 11, split into those with final determinations (made either by AEMC or alternate bodies), under consideration, or still pending consultation.

Figure 11: Timeline of selected rule changes and reforms for analysis



¹⁹ As of 31 July 2019.

4.2 Classification of reforms

As per Step 1 of our framework, we must first categorise the reforms into the four respective groups – Wholesale market, Contracting, Generation, and Networks. Table 5 provides a high-level overview of this categorisation, while a detailed summary on each rule change is provided in Appendix A. As noted, the majority of reforms selected fit under the category of wholesale market reforms, in that they predominately impact the operation of the wholesale market and related functions such as intervention.

While this is the preliminary categorisation of the reforms, we note that our subsequent analysis allows us to place reforms in more than one category if necessary. We will outlined where this has been done in the subsequent sections.

Table 5: Categorisation of selected rules and reforms

Category	Rules
Wholesale market	<ul style="list-style-type: none"> ● Application of the Regional Reference Node Test to the Reliability and Emergency Reserve Trader ● Threshold for participant compensation following market intervention ● Intervention compensation and settlement processes ● Enhancement to the Reliability and Emergency Reserve Trader ● Participant compensation following market suspension ● Transmission loss factors ● Wholesale demand response mechanism ● Global settlement and market reconciliation ● Five minute settlement
Contracting	<ul style="list-style-type: none"> ● Short term forward market ● Market making arrangements in the NEM ● Retailer Reliability Obligation ● Voluntary market making
Generation	<ul style="list-style-type: none"> ● Transparency of new projects ● Generator three year notice of closure ● Generator registration thresholds ● Primary frequency response requirement ● Removal of disincentives to primary frequency response ● Monitoring and reporting on frequency control framework ● Improving transparency and extending duration of MT PASA ● System restart services, standards and testing
Networks	<ul style="list-style-type: none"> ● Maximum reactive current during a fault ● Demand management incentive scheme and innovation allowance for TNSPs

4.3 Assessment of reforms

For each of the categories above, we have then performed Step 2 of our framework, performing assessments on each pair of reforms in order to assess their level of congruency. The results of the assessment for the four categories of reforms are shown in Figure 12 and Figure 13. A brief summary

of the reasoning behind each assessment is provided in Appendix B with some key results from the assessment provided below:

Rules and reforms assessed

- 23 rules and reforms were assessed, with 6 reforms being re-categorised during assessment and now falling under more than one category.
- Reforms classified under wholesale market and generation had the largest number of reforms assessed, with 10 each (including reforms under multiple categories).
- Only 7 reforms had no interaction with any other reform. All other 16 reforms had at least one overlap.

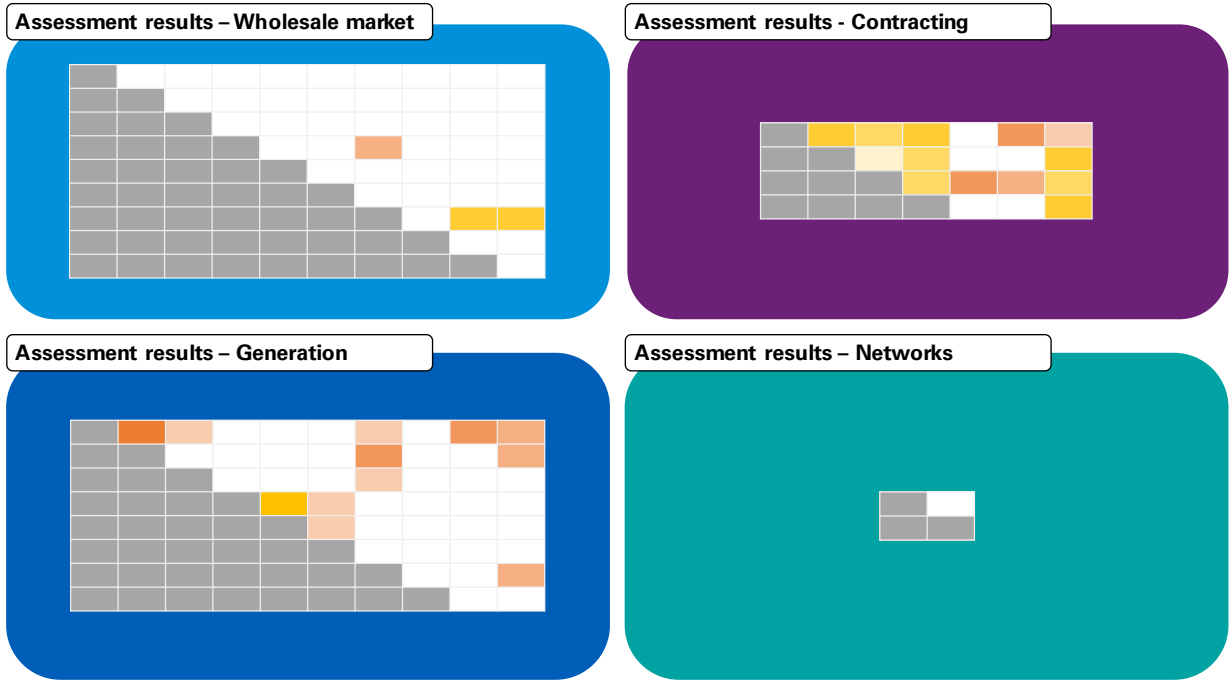
Assessment of reform pairs

- 108 pairs of reforms were assessed in total across the four categories, with 45 in Wholesale market, 44 in Generation, 18 in Contracting, and 1 in Networks.
- 80 pairs of reforms found no overlapping outcomes or objectives. This means 26% of the assessed pairs (28 in total) found an overlap of some magnitude.

Overlapping reforms

- Out of the 28 overlaps, 12 raised questions regarding congruency and were negatively scored, while 16 had a positive overlap.
- 16 overlaps were not acknowledged by the decision maker or proponent for the rule change, with 10 of these being negative overlaps.
- The lowest score was -5 (awarded to one pair of reforms), while the highest score was +5 (awarded to one pair of reforms).

Figure 12: Overview of assessment results for all categories



Score	Description
-5	Major overlaps in the long-term that raise issues with congruency and have not been acknowledged.
-4	Minor overlaps in the long-term that raise issues with congruency and have not been acknowledged.
-3	Major overlaps in the long-term that raise issues with congruency but have been acknowledged.
-2	Major overlaps in the short-term that raise issues with congruency but have been acknowledged.
-1	Minor overlaps in the short-term that raise issues with congruency but have been acknowledged.
0	
1	Minor overlaps in the short-term that are congruent but have not been acknowledged.
2	Major overlaps in the short-term that are congruent but have not been acknowledged.
3	Major overlaps in the long-term that are congruent but have not been acknowledged.
4	Minor overlaps in the long-term that are congruent and have been acknowledged.
5	Major overlaps in the long-term that are congruent and have been acknowledged.

Figure 13: Breakdown of reform assessments

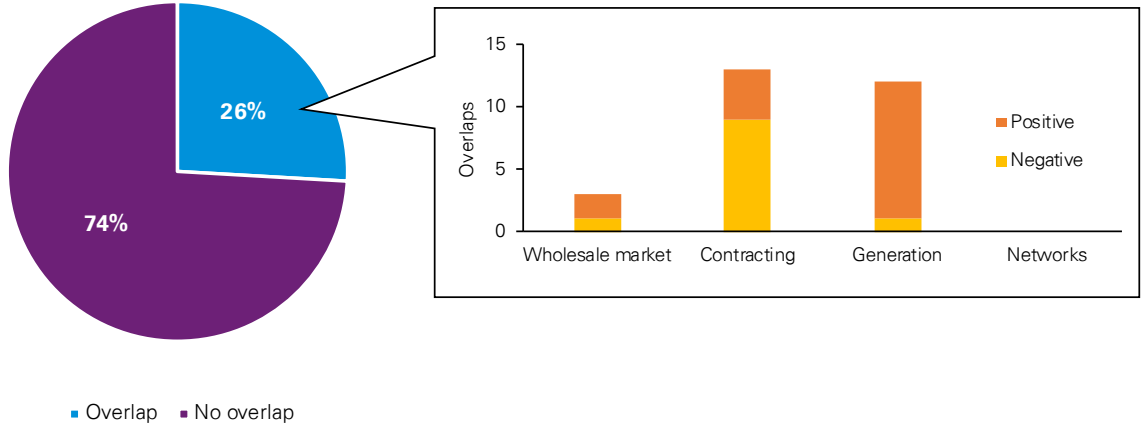
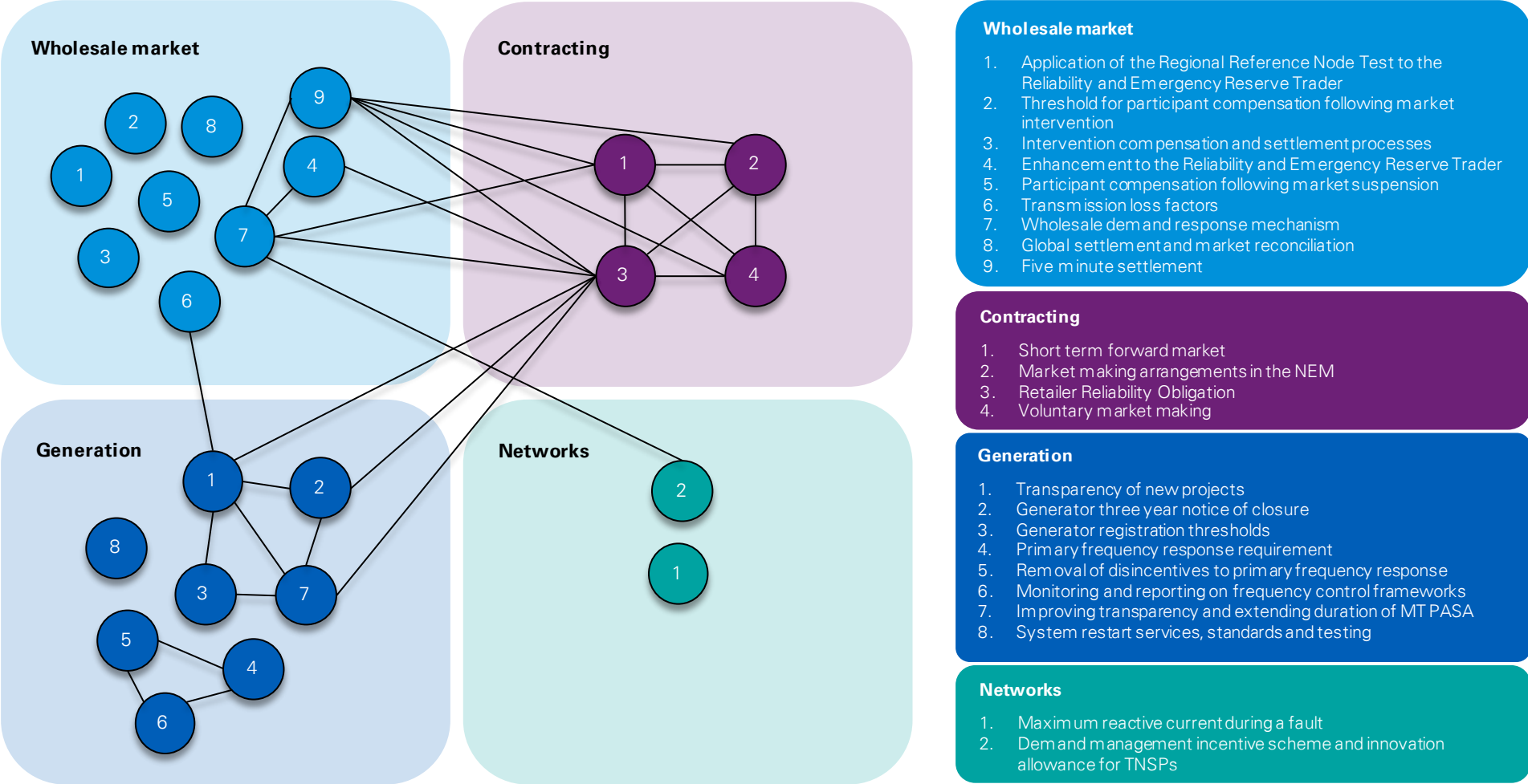


Figure 14 provides an overview of the interactions between the various reforms and categories, highlighting the cross-category overlaps for various reforms. As noted, the assessment found that 70% of rule changes had interactions in some way with one or more other reforms. 28 overlaps were found amongst these reforms, drawing into focus the complexity of the policy landscape and the importance of thorough evaluation of reforms prior to implementation.

Figure 14: Overview of overlapping reforms



4.4 Category analysis – Wholesale market

The results of the assessments for the wholesale market category are provided below in Figure 15. In addition to the original nine reforms classified under this category, another reform was added after the preliminary classification:

- **Demand management incentive scheme and innovation allowance for TNSPs:** Given the direct link between demand response incentivised under the Transmission Network Service Provider (TNSP) scheme compared to implementation under the wholesale demand response mechanism (DRM), there is likely to be an interaction between these reforms.

Figure 15: Assessment results – Wholesale market

	Application of the Regional Reference Node Test to the RERT	Threshold for participant compensation following market intervention	Intervention compensation and settlement processes	Enhancement to the Reliability and Emergency Reserve Trader	Participant compensation following market suspension	Transmission loss factors	Wholesale demand response mechanism	Global settlement and market reconciliation	Five minute settlement	Demand management incentive scheme and innovation allowance for TNSPs
Application of the Regional Reference Node Test to the RERT		0	0	0	0	0	0	0	0	0
Threshold for participant compensation following market intervention			0	0	0	0	0	0	0	0
Intervention compensation and settlement processes				0	0	0	0	0	0	0
Enhancement to the Reliability and Emergency Reserve Trader					0	0	3	0	0	0
Participant compensation following market suspension						0	0	0	0	0
Transmission loss factors							0	0	0	0
Wholesale demand response mechanism								0	-4	-4
Global settlement and market reconciliation									0	0
Five minute settlement										0

Score	Description
-5	Extensive congruency questions
-4	Major congruency questions
-3	Moderate congruency questions
-2	Minor congruency questions
-1	Limited congruency questions
0	No overlap
1	Limited reinforcement
2	Minor reinforcement
3	Moderate reinforcement
4	Major reinforcement
5	Extensive reinforcement

Decision maker
AEMC
ASX
ESB

Overview

While there were a range of reforms considered under the wholesale market category, many of these pairings were not deemed to have overlapping outcomes and objectives. This is due to the specific nature of each rule's objective and/or outcome which largely differed by target beneficiaries and targeted problems in the wholesale market.

Five of the rule changes were specific to market intervention and suspension. These were made by AEMO following findings from the AEMC's Reliability Frameworks Review, which showed increased frequency and duration of interventions. This led to the identification of several anomalies and inefficiencies in the intervention pricing and compensation processes. All five rule change requests were submitted together following extensive stakeholder consultation.

Some of these initially appeared to be broadly overlapping in outcomes, however, given the specific objectives it was determined that they were each addressing separate parts of the overall issue. Many reforms dealt with intervention in the market under the Reliability and Emergency Reserve Trader (RERT) function. For example, the "Threshold for participant compensation" and "Application of the Regional Reference Node Test to the RERT" broadly aimed to ensure appropriate pricing was made during market intervention. However, the former rule's objective was to appropriately compensate participants following market intervention while the latter was to provide appropriate pricing during the market intervention itself.

Three interactions between reforms were identified within this category, all pertaining to the implementation of the wholesale DRM. Firstly, the DRM was seen to be congruent with the enhanced RERT. This is due to the cross-benefits in promoting the uptake of demand response (DR) in the NEM, as the extended RERT allows AEMO to potentially procure more DR as a reserve than was previously possible under a shorter timeframe. Growing DR through a wholesale DRM is likely to complement any RERT procurement.

When considered against the proposed Demand Management Incentive Scheme (DMIS) and five minute settlements, there are some initial questions regarding congruency of the wholesale DRM. While the DMIS and DRM both look to incentivise DR in the NEM, these are potentially procured through different means and could result in mixed signals to market participants as a result. Demand response aggregators would potentially have incentives offered from both TNSPs through the DMIS as well as retailers through the DRM. The DMIS and wholesale DRM are also at this stage proposed to be implemented and managed by two separate parties: AEMO and the Australian Energy Regulatory (AER).

When considered against five minute settlements, there remain questions around how to enable DR to respond effectively to five minute price signals. While the AEMC has taken steps to investigate this interaction in their determination on the five minute settlement rule change²⁰, there are still conflicting views from stakeholders and now there are new questions raised with how this interacts with the proposed DRM. While the implementation of a short-term forward market could alleviate these concerns²¹, this potential impact should be acknowledged in the design. The negative scoring reflects that these potential issues should be investigated further.

Impacts to consumers

Given the large costs that could be incurred through IT system upgrades for AEMO from both the five minute settlements and wholesale DRM, it is important that these upgrades are properly aligned in order to reduce costs to consumers. Although AEMO is responsible for both system upgrades, the potential overlap between the two reforms needs to be investigated further to understand the holistic costs and benefits of these upgrades. Given the costs of these upgrades are borne by consumers, alignment becomes particularly important.

The potential split in demand resources between procurement by TNSPs (through DMIS) and retailers (through the DRM) also warrants further investigation given the potential inefficiencies which may increase the overall cost of DR to the market. Given the impacts of the DMIS have not yet been modelled in conjunction with a DRM, it is unclear whether the benefits afforded by both are additive

²⁰ AEMC, *Rule Determination: National Electricity Amendment (Five Minute Settlement) Rule 2017* (2017)

²¹ AEMC, *Consultation Paper: National Electricity Amendment (Short term forward market) Rule 2019* (2019)

and have no redundancies. This analysis is important to understand the costs and benefits associated with the two reforms given they both incentivise the same type of resource.

Governance

Given all rule changes are being progressed by the AEMC, there are no immediate questions raised with regards to coordination, other than for the AEMC to consider the reforms as a holistic set of changes to the wholesale market rather than individual reforms.

During implementation however, it will be important that the wholesale DRM and DMIS are developed and implemented in a way that allows for harmonisation between the two schemes. If a TNSP procures demand management and demand response using different baselines compared to the wholesale DRM, this could lead to inefficient market signals to participants. As the AER is responsible for the DMIS and AEMO is responsible for setting baselines and implementing the wholesale DRM, any overlap between these functions needs to be carefully coordinated between the two market bodies.

4.5 Category analysis - Contracting

The results of the assessments for the contracting category are provided in Figure 16. Reforms that were added after the preliminary classification are highlighted. In addition to the original four reforms classified under this category, the assessment also identified three additional reforms which had secondary impacts in the contracting market and were included in the half-matrix. These were:

- **Enhancement to the Reliability and Emergency Reserve Trader:** Given the RRO sits within the RERT, there is an inherent overlap in objectives between the two reforms.
- **Wholesale demand response mechanism:** As well as the impact on wholesale markets, the wholesale DRM is likely to increase contracting levels within the market for DR. This may interact with other reforms looking to increase contracting levels in the market.
- **Five minute settlement:** A key outcome of five minute settlement and a concern raised by many stakeholders is its impact on the contract market and potential barriers to liquidity given the difficulty to cover cap contracts under five minute settlements for some generators. This was thought to have an impact on reforms looking to increase contract market liquidity.

Figure 16: Assessment results - Contracting

	Short term forward market	Market making arrangements in the NEM	Retailer Reliability Obligation	Voluntary market making	Enhancement to the Reliability and Emergency Reserve Trader	Wholesale demand response mechanism	Five minute settlement
Short term forward market		-4	-3	-4	0	4	2
Market making arrangements in the NEM			-1	-3	0	0	-4
Retailer Reliability Obligation				-3	4	3	-3
Voluntary market making					0	0	-4

Score	Description
-5	Extensive congruency questions
-4	Major congruency questions
-3	Moderate congruency questions
-2	Minor congruency questions
-1	Limited congruency questions
0	No overlap
1	Limited reinforcement
2	Minor reinforcement
3	Moderate reinforcement
4	Major reinforcement
5	Extensive reinforcement

Decision maker
AEMC
ASX
ESB

Overview

The contracting market allows participants to hedge financial risk in the spot market through a number of means, including OTC and standardised contracts on the ASX. This is a key part of reducing price uncertainty for any participant, and a healthy and liquid contract market ensures competition and efficient risk allocation within the market.

As noted in Figure 16, there are several instances where reforms have overlapping outcomes and objectives. Out of the 21 assessments made, 15 exhibited some form of overlap. Appendix B provides further detail on the reasoning behind these assessments.

In general terms, we find that the negatively scored overlaps observed are largely due to the number of reforms that are attempting to improve contract market liquidity through different or the same mechanisms. There also remain secondary outcomes of rule changes (such as the impact of five minute settlements on the contract market) that have not been acknowledged.

These all raise questions with regards to how the reforms would work together in practice, and whether there are redundant benefits being offered through implementation of all reforms under consideration. This is largely due to the redundancy that market making has when considered alongside a set of alternative reforms which also aim to increase contract market liquidity. Further, there are questions regarding governance and coordination of these reforms, given that the short-term forward market (STFM), market making arrangements, voluntary market making, and the RRO are all governed by separate parties. In addition, the timescales of each reform differ slightly, with the STFM boosting liquidity a week out, ASX products have a minimum tenor of a month, while the RRO requires liquidity over a year ahead of time and may not always (if ever) be triggered.

Impacts to consumers

Once contract market liquidity has been addressed, there may be diminishing returns on further reforms for consumers which should be investigated further. This is highlighted by the AEMC's draft determination on "Market making arrangements in the NEM"²², which contained a cost-benefit analysis on the various contract market liquidity mechanisms (with the exclusion of the STFM). The analysis underpinned the draft determination to not proceed with the reform based on the fact that it was not shown to provide additional benefit on top of the voluntary ASX market making services and the Market Liquidity Obligation (MLO) as part of the RRO. This demonstrates the inefficient costs consumers could face through implementation of several related reforms.

Another example is the impact on long-term consumer efficiency as a result of the five minute settlement rule change. Our assessment (see Appendix B) noted that there may be questions with regards to how five minute settlements impacts contracting liquidity in favour of more efficient wholesale market operation. While on balance this may improve consumer outcomes, understanding the true impact will require thorough evaluation once it is implemented.

Governance

We note that multiple bodies have decision-making responsibility or implementation responsibility for the contracting reforms. This could be contributing to the congruency questions raised by the assessment framework. Since the reforms have also been progressed at different times, there are also considerations which need to be made in terms of order of implementation. Given the RRO and ASX market making arrangements have been implemented as of mid-2019, evaluating the benefits of the other contract market reforms focusing on liquidity will need to use this as a baseline for comparison. However, the success of these current arrangements are unlikely to be known prior to decisions being made on rule changes considered by the AEMC. This means there could be a mismatch between the rules made and the rules required by the market, as decision makers will be required to make an assumption on the success of the ASX and RRO reforms.

Going forward it will be crucial for the decision maker to consider the impact on contract market liquidity as a result of all reforms underway. To some extent, this has been demonstrated with the draft determination for "Market Making Arrangements in the NEM", which recommended not to

²² AEMC, *Draft Rule Determination: National Electricity Amendment (Market Making Arrangements in the NEM) Rule 2019* (2019)

proceed in light of the alternative measures underway, and provided an analysis of costs and benefits of various contract market liquidity reforms. This line of investigation promotes congruency and efficient allocation of risk and costs to participants. However, there is room for further analysis on the proposed STFM and its potential impact on contracting in the NEM.

4.6 Category analysis – Generation

The results of the assessments for the generation category are provided below in Figure 17. In addition to the original seven reforms classified under this category, the assessment also identified two additional reforms that had secondary impacts on generators. These were:

- **Transmission loss factors:** As the transmission loss factor reform proposes to allow generators more visibility over their expected marginal loss factors (MLFs) and provide this information to new investors and projects, there is a clear impact on generators in the market.
- **Retailer Reliability Obligation:** The RRO was expected to overlap in outcomes with several of the reforms for generation given the benefits that increased visibility over generation has on reliability forecasting for AEMO and associated processes.

Figure 17: Assessment results - Generation

	Transparency of new projects	Generator three year notice of closure	Generator registration thresholds	Primary frequency response requirement	Removal of disincentives to primary frequency response	Monitoring and reporting on frequency control framework	Improving transparency and extending duration of MT PASA	System restart services, standards and testing	Transmission loss factors	Retailer Reliability Obligation
Transparency of new projects		5	2	0	0	0	2	0	4	3
Generator three year notice of closure			0	0	0	0	4	0	0	3
Generator registration thresholds				0	0	0	2	0	0	0
Primary frequency response requirement					-5	2	0	0	0	0
Removal of disincentives to primary frequency response						2	0	0	0	0
Monitoring and reporting on frequency control framework							0	0	0	0
Improving transparency and extending duration of MT PASA								0	0	3
System restart, standards and testing									0	0

Score	Description
-5	Extensive congruency questions
-4	Major congruency questions
-3	Moderate congruency questions
-2	Minor congruency questions
-1	Limited congruency questions
0	No overlap
1	Limited reinforcement
2	Minor reinforcement
3	Moderate reinforcement
4	Major reinforcement
5	Extensive reinforcement

Decision maker
AEMC
ASX
ESB

Overview

Efficient investment signals for generators in the NEM are essential for promoting competition and lowering costs for consumers. Barriers to entry such as regulatory risk, information asymmetry, and entrenched market power can stifle investment and create issues regarding supply and demand.

A range of reforms are currently underway which seek to improve the conditions under which investment is made in generation across the NEM. Our assessment has found that while there are a wide range of overlapping reforms in terms of their outcomes and objectives, there were no immediate questions around congruency, and as a result, nearly all of the assessed overlaps are scored as positive. Appendix B provides further information on these linked reforms shown in Figure 17.

The common theme between these reforms is the increase in information and transparency for new entrants into the market. However, while this is a common overarching objective, all rule changes proposed provide different pieces of information to prospective generators and to the market. Therefore, there is little redundancy, and each additional information category is expected to promote more efficient investment.

Another common theme across the category is the alignment of timeframes regarding forecasting data for generators provided by AEMO. The Medium Term Projected Assessment of System Adequacy (MT PASA), generator notice of closure, and RRO have all been designed with congruency in mind, aligning the timeframes to a three year forward window in order to boost transparency in that window. Acknowledgment by the decision maker on all three of these alignments demonstrates well-coordinated decision making.

Only one pair of reforms raised questions with regards to congruency – “Primary frequency response requirement” and “Removal of disincentives to primary frequency response”. As noted in Appendix B, these reforms have identical objectives and would be inefficient to implement independently. As both of these reforms are currently pending, the AEMC has not yet assessed their overlapping objectives. Given the clear overlap, it is likely that this will be assessed during the consultation phase.

It was noted during our assessment that the “Generator registration threshold” rule change has a broad-reaching impact upon all Generation reforms (and others) in the market. The rule change is proposed to lower the registration threshold from 30 MW to 5 MW for generators in the market, exposing a higher proportion of generators in the NEM to obligations under the NER. This interaction has not been included in our analysis given that for the most part there is no explicit overlapping outcome or objective. However, if progressed, this rule change will require detailed analysis with the majority of other rule changes underway given its far reaching impact.

Impacts on consumers

Improving transparency in the generation market typically has the impact of reducing information asymmetries and promoting more efficient plant entry and exit from the market, thereby promoting the long-term interests of consumers.

While the alignment of timeframes for various mechanisms such as generator closure periods, the RRO, and MT PASA promotes efficiency through improving information at an investment horizon timeframe, there are conflicting views on whether information at a longer timeframe would increase or decrease efficiency in the market. At a certain point, the inaccuracy of information that is too far in

advance could mislead investment decisions and provide proponents with a degree of confidence in outcomes that may not materialise in practice.

This issue was explored in-depth in the discussion by the AEMC²³, where stakeholders provided views on whether three years was an appropriate amount of time to provide useful information to the market. While there were arguments for extending the information provision, most stakeholders found three years as an appropriate balance between certainty and investment planning.

Regarding costs and benefits, the provision of additional information does not appear to have a significant and ongoing cost burden on proponents and AEMO (the parties predominately included within the reforms). With regards to transparency of information for new projects, much of this information is already captured by AEMO, only requiring an additional step of publication and updates.

Governance

All reforms proposed under the generation category are being progressed by the AEMC and are being implemented by a single market institution (AEMO). This may make coordination and alignment of various processes and mechanisms more straightforward and reduces the risk of conflicting signals or inefficient costs to consumers.

While our assessments in Appendix B noted that there was failure to acknowledge the harmonisation of certain pairs of reforms, this does not present a material issue given there are no initial questions that have been raised with regards to congruency. Furthermore, as most of the rule changes within this category are in early stages of submission (without consultation papers prepared by the AEMC), there is potential to better explore and build upon this congruency throughout the various rule change processes.

Going forward, it will be important that further rule changes surrounding the provision of information to generators is governed by the same rule change process and that responsibility and risk is allocated properly, in order to maintain this efficiency in the rule change process.

²³ AEMC, *Rule determination: National Electricity Amendment (Generator Three Year Notice of Closure) Rule 2019* (2019)

4.7 Category analysis – Networks

The results of the assessments for the networks category are provided below in Figure 18. No reforms were added after the preliminary classification. We note that the network reforms assessed in this paper are the ones currently being considered by the AEMC.

Figure 18: Assessment results - Networks

	Maximum reactive current during a fault	Demand management incentive scheme and innovation allowance for TNSPs
Maximum reactive current during a fault		0
Demand management incentive scheme and innovation allowance for TNSPs		

Score	Description
-5	Extensive congruency questions
-4	Major congruency questions
-3	Moderate congruency questions
-2	Minor congruency questions
-1	Limited congruency questions
0	No overlap
1	Limited reinforcement
2	Minor reinforcement
3	Moderate reinforcement
4	Major reinforcement
5	Extensive reinforcement

Decisionmaker
AEMC
ASX
ESB

Overview

In this category, the two rule changes, ‘Maximum reactive current during a fault’ and ‘Demand Management Incentive Scheme and Innovation Allowances for TNSPs’, were found to have no overlapping outcomes or objectives during our assessment. This is due to the highly-tailored objective of each rule change request. The first rule considers a technical calculation involving voltage control while the second rule considers financial incentives for investment into demand response. Broadly, they both relate to issues of network reliability and security, but through completely different means.

We note it may be relevant to consider these new rules within the context of existing rules. This has been outlined during the consultation paper for DMIS, which observed that the current incentive mechanisms available to TNSPs – Efficiency Benefit Sharing Scheme (EBSS), Capital Expenditure Sharing Scheme (CESS) and Service Target Performance Incentive Scheme (STPIS) – are insufficient for incentivising networks to invest in non-network solutions such as demand management.²⁴ In this regard, it would be more efficient to extend DMIS to TNSPs as it would not overlap with the existing

²⁴ AEMC, *Consultation paper: National Electricity Amendment (Demand management incentive scheme and innovation allowance for TNSPs) Rule* (2019)

network incentive schemes. Further analysis would be required if other TNSPs schemes were proposed to ensure congruency between network incentives.

Impacts on consumers

Both reforms have the potential to work together to promote efficiency in the long term interests of consumers. The DMIS could allow for more non-network solutions (demand management) to be developed by TNSPs, which could reduce the overall long term costs of supplying electricity to customers. The maximum reactive current rule is likely to benefit generators by improving voltage control, which improves reliability for customers. Under the proposed wording of the rule, the proponent has suggested there will be no additional costs incurred by any parties. This is still to be determined by the AEMC.

Governance

Moving forward, there is little need for the AEMC to coordinate the two rule changes given their minimal overlap. However, there is likely need to coordinate the individual rules to ensure they are congruent with other rules relevant to them. For the DMIS, the AER would be responsible for administering the scheme during the revenue reset process and should therefore be consulted with on how best to implement the scheme.

5 Interaction with external factors

There are a number of external factors outside of the NEM framework that influence outcomes in the market. While these are out of scope of this report, we have summarised the key external factors and their importance to outcomes to the NEM in this chapter.

We have considered five different categories of external factors to the wholesale electricity market, namely:

- gas markets;
- retail markets;
- funding of new transmission infrastructure upgrades;
- Federal Government policies and subsidies; and
- state-based policies and subsidies.

5.1 Gas market

The Australian east-coast gas market has undergone considerable change since the introduction of the liquefied natural gas (LNG) export industry in Queensland. Despite a large growth in gas supply across Australia, domestic gas prices have increased in response to significant demand from the LNG export sector.

The delivered gas price to power stations is linked to outcomes in the NEM. As a key generation technology across the electricity network, an increase in operating costs for gas generators can be reflected in higher wholesale prices. Policies such as the federal Australian Domestic Gas Security Mechanism (ADGSM) could alleviate these supply concerns, but also add uncertainty around the allocation of new supply and the business case for future gas development.²⁵ This is coupled with state government restrictions on gas exploration in states such as Victoria²⁶ and New South Wales²⁷, which reduces the supply of new gas into the market.

It is important to also consider rule changes to the gas trading markets, such as the changes to the Declared Wholesale Gas Market (DWGM) and Authorised Maximum Daily Quantity (AMDQ) regime, as these have potential to influence wholesale gas prices and therefore outcomes in the NEM.

As gas pricing and supply remains a pivotal issue in Australia, there needs to be continued assessment on how outcomes in the gas market impact upon the NEM and proposed future reforms.

²⁵ Australian Government, *Australian Domestic Gas Security Mechanism* (2019) "<https://www.industry.gov.au/regulations-and-standards/australian-domestic-gas-security-mechanism>"

²⁶ Victoria State Government, *Restrictions on onshore gas* (2019) "<https://earthresources.vic.gov.au/geology-exploration/oil-gas/restrictions-on-onshore-gas>"

²⁷ NSW Government, *Exploration and production in NSW* (2019) "<https://www.resourcesandgeoscience.nsw.gov.au/landholders-and-community/coal-seam-gas/the-facts/exploration-and-production>"

5.2 Retail market

Major changes and interventions into the retail market need to be considered against reforms underway in the NEM in order to understand any potential ramifications.

An example of major change in the retail market is the introduction of DMO pricing as of July 2019, as per a recommendation from the ACCC's Retail Pricing Inquiry. The intent of this change is to effectively introduce a benchmark for retail prices given to consumers in order to reduce margins taken by retail businesses and promote competitive outcomes for consumers.²⁸ The DMO would replace the current retailer-set standing offers, and would be set by the AER in accordance with a pricing methodology based on an efficient cost of operation in the region.

Major reforms to the retail market could result in congruency implications for current or potential rule changes or proposed reforms to wholesale, generation, contracting or network components of the electricity supply chain, and should be appropriately considered.

5.3 Transmission network upgrades

There have been a range of transmission network upgrades proposed through AEMO's Integrated System Plan (ISP), TNSPs and federal and state governments. These seek to plan for future supply and allow for future investment across the NEM. Key transmission upgrades include potential upgrades between Queensland and New South Wales, an interconnector between South Australia and New South Wales, the Marinus Link between Tasmania and Victoria, and various others.

While transmission upgrades can provide added reliability into the electricity market through better balancing of supply and demand across the NEM, it can also impact outcomes across the different regions of the NEM wholesale market. Further, the necessity of transmission upgrades needs to be carefully considered, given that costs are currently recovered directly through charges to consumers.

Increased transmission in the NEM has a significant impact upon internal factors within the NEM. A large amount of network investment will impact investment signals to generators and influence decisions on where new assets are built. This can materially impact the function of the wholesale market depending on outcomes regarding congestion and loss factors.

5.4 Government policies

Both federal and state government policies in Australia can have a material impact upon the function and efficiency of the NEM. It is therefore crucial that these government bodies consider the costs and benefits that a policy would incur upon the NEM, particularly in light of the current reforms underway. Optimally, running the assessment framework across federal and state schemes would result in a better understanding from these parties on how to best mitigate risks with regards to congruency in the market and how to encourage further investment into the electricity market.

Federal government

Subsidies and investment mechanisms can influence market signals for generation and impact upon outcomes from the wholesale market.

The incentives provided under UNGI as well as the funding of Snowy 2.0 will provide added dispatchable capacity into the network, which may interact with reforms underway in the market such

²⁸ Australian Energy Regulator, *Final Determination: Default Market Offer Prices 2019-20* (2019)

as the five minute settlement framework. Additionally, there was a proposal for asset divestiture of large market powers as a potential solution to competition concerns in the NEM.²⁹ While it is uncertain as to whether this will eventuate in practice, it is crucial to understand the impact that these types of policies will have on investment certainty in the NEM, as continued efficient and timely investment is required as the market transitions and new capacity is required.

State governments

State-level incentives and investments can influence outcomes across the NEM and within each specific region, and can reinforce or conflict with proposed rule changes and reforms.

The Queensland Renewable Energy Target (QRET)³⁰ and Victorian Renewable Energy Target (VRET)³¹ provide examples of state-based policies that are providing a market signal to increase the amount of renewable generation in the NEM. Conversely, other state-based policies such as the Emerging Energy Program (EEP) in New South Wales provide investment signals to dispatchable technologies such as battery storage and pumped hydro.³²

Direct incentives to certain types of generation can have an impact on competition, contracting, and overall function of the wholesale market in the NEM. While coordination of different state policies is difficult, it is important to have an understanding of the likely impact that the combination of state targets and programs will have on the overall outcomes in the NEM.

²⁹ Ludlow, M., "Energy retailers set to fight Morrison government's 'big stick' divestiture laws" (2018), <https://www.afr.com/news/politics/energy-retailers-prepare-to-fight-morrison-governments-big-stick-divestiture-laws-20181025-h172uy>

³⁰ Queensland Government Department of Energy and Water Supply, *Powering Queensland Plan* (2017)

³¹ Victoria State Government, "Victoria's renewable energy targets" (2019), <https://www.energy.vic.gov.au/renewable-energy/victorias-renewable-energy-targets>

³² NSW Government, "Emerging Energy Program" (2019), <https://energy.nsw.gov.au/renewables/clean-energy-initiatives/emerging-energy-program>

6 Extending the framework to COGATI

The assessment in this report has predominately focussed on rule changes and reforms that represent incremental changes to the market design. However, there are large-scale reforms currently underway that could supersede many of these changes. One of these reforms is COGATI, which is a broad reform to change the coordination of generation and transmission investment.

Through applying the framework we have developed to this large-scale reform, we can understand the impacts that COGATI is likely to have and its congruency when compared to the other reforms underway in the market. This can provide a starting point for further discussion on the reform and guide further thinking as the reform is progressed.

In this chapter we will introduce the reform's objectives, apply the three step framework, analyse COGATI against external factors, and provide some insight into its interaction with the other large-scale reform underway – NEM2025.

This analysis assumes that the model in the Directions Paper is implemented.³³

6.1 Overview of reform

In response to the large increase in generation capacity and transmission investment forecast to enter into the NEM over the next 10 years, the AEMC is undertaking a review of the current generation and transmission access framework known as COGATI.

The AEMC has proposed a three-step approach to incentivise generators and networks to facilitate better planning and coordination:

- 1) Shifting from a single Regional Reference Price (RRP) for a region to dynamic local marginal prices at a set of nodes, in order to better reflect the value of congestion in the network. This would apply to generation, load, and storage for scheduled and semi-scheduled participants.
- 2) Introduce the ability for generators to purchase transmission hedges in exchange for contributing to the costs of new transmission infrastructure. This would hedge against price differences between different nodes in the network in order to reduce the risk introduced by dynamic local pricing.
- 3) Use the purchase of transmission hedges to guide future decisions on transmission investment, better reflecting where investment is most needed and allowing costs to be recovered partially through sale of transmission hedging products.

While these changes would alter the function of the NEM in both the wholesale market and in generation and network planning, it is intended that this would better allocate risks in the market and contribute towards an increase in generation and transmission efficiency.

³³ AEMC, *Directions paper: Coordination of Generation and Transmission Investment – Access reform* (2019)

6.2 Application of the framework

6.2.1 Classification of reform

The first step of the framework is to place the reform within one of the four categories – Wholesale market, Contracting, Generation, or Networks. While typically we are meant to place the reform in one category, perform the analysis, and then reevaluate whether it should be placed in another category, COGATI presents such a wide-scale reform to the market that it becomes quickly apparent that there are overlaps amongst all categories.

For example, dynamic nodal pricing rather than a RRP will impact the function of the wholesale spot market, the introduction of transmission hedges and settlement of contracts against nodal pricing will impact the contract market, and the investment incentives and signals for generation and networks will be altered.

We therefore conducted our analysis of COGATI within each of the four categories of reforms.

6.2.2 Assessment of reform

Using the assessment questions developed in the framework, a number of interactions have been identified between reforms currently underway and the proposed COGATI. While further detail is required on COGATI in order to better understand these, this is an unsurprising result for such a large-scale change to the function of the market.

As noted in Figure 19, our assessment found that COGATI had overlapping outcomes and objectives for 13 reforms (out of the 23 considered in this report). The majority of these overlaps raised questions with regards to congruency between the reforms. These should be investigated further as COGATI continues to be developed and highlights the importance of a holistic analysis of proposed reforms.

Figure 19: Assessment results for COGATI among each existing category of reform

Wholesale market		Contracting		Generation		Networks	
Application of the Regional Reference Node Test to the RERT	-3	Short term forward market	-4	Transparency of new projects	4	Maximum reactive current during a fault	0
Threshold for participant compensation following market intervention	0	Market making arrangements in the NEM	-4	Generator three year notice of closure	2	Demand management incentive scheme and innovation allowance for TNSPs	-4
Intervention compensation and settlement processes	0	Retailer Reliability Obligation	-3	Generator registration thresholds	0		
Enhancement to the Reliability and Emergency Reserve Trader	-3	Voluntary market making	-4	Primary frequency response requirement	-4		
Participant compensation following market suspension	0			Removal of disincentives to primary frequency response	-4		
Transmission loss factors	-2			Monitoring and reporting on frequency control framework	0		
Wholesale demand response mechanism	0			Improving transparency and extending duration of MT PASA	0		
Global settlement and market reconciliation	0			System restart services, standards and testing	0		
Five minute settlement	-4						

6.2.3 Detailed category analysis

In order to better understand the reasoning behind the identified overlaps, we look into the general themes and observations across the categories of reforms, as well as investigate the impacts on consumers and concerns around governance.

Wholesale market

The wholesale market for electricity will be impacted by the introduction of dynamic nodal pricing in place of a RRP. Although differences in the price will only eventuate in the presence of congestion in the network, it is a change in terms of implementation and the overall function of settlement and bidding practices in the market.

One of the intentions of COGATI is to remove disorderly bidding practices (whereby congestion spurs generators to bid at the market floor in order to prioritise dispatch). This represents a clear overlap in the objectives of five minute settlements in the market, which also aim to remove disorderly bidding through reducing perverse incentives to withhold capacity during dispatch intervals. Although the two disorderly practices are somewhat independent, there is potential for some redundancy in the benefits offered by both changes to the wholesale market. Implementation of one may result in an increase in efficient bidding practices that means the costs of the other reform are no longer justified.

There is a further interaction between COGATI and the proposed changes to loss factor frameworks. While the loss factor and intra-regional settlement residues rule change underway in the market is designed to modify the framework to increase transparency and certainty for generators, COGATI could lead to the introduction of real-time loss factor calculation. Although this could increase accuracy, it would likely reduce certainty on the revenue of generators in any given year. The linkages here have been meticulously acknowledged by the AEMC, along with the need for alignment between the two processes.³⁴

Other notable interactions with COGATI are predominately with reforms which rely on regional nodes, including the application of the regional reference node test to the RERT, and the function of the RERT itself. How these aspects will be treated under a nodal pricing system will need to be explored further in order to better understand potential flow-on impacts from COGATI.

While not captured in the analysis, there may be a potential interaction between COGATI and the wholesale demand response mechanism, given that load aggregators can set market spot prices and will need to be able to purchase transmission hedges in order to mitigate their exposure.

Contracting

There is likely to be a notable impact from COGATI on the contracting market, which has been briefly noted by the AEMC in their recent directions paper.³⁵ Introducing nodal pricing means that contracts will need to be settled at various nodes rather than at a central reference node. This has the risk of splitting liquidity in the contract market, as noted by the AEMC, and reducing overall liquidity of the market as a whole. While transmission hedges are designed to reduce uncertainty from generators due to the switch to nodal pricing, it is unknown whether or not this will sufficiently alleviate liquidity concerns and allow for competitive contracting that has currently underpinned the NEM. Further, nodes within the NEM that do not have large amounts of contracting activity could suffer from the exercise of market powers and lead to illiquid contracting.

This significant impact on contracting markets in the NEM counters the various reforms underway to increase liquidity in the market, such as the market making reforms, STFM, and the MLO under the RRO mechanism. While there is an opportunity for these liquidity reforms to counteract any impacts

³⁴ *ibid.*

³⁵ *ibid.*

brought about by COGATI, it is unclear at this stage whether this would be the case. Further work on COGATI requires a deeper look into the impacts on contract market liquidity as a result of nodal pricing, and a consideration of the costs and benefits of introducing these reforms as a package into the market. Failure to do so could create redundancies in reforms and inefficient costs to consumers, while increasing the overall risk and price for participants in the market.

Generation

The introduction of COGATI provides a new paradigm for generation investment, and will require a different approach by investors. Generators will now need to understand their risk from a nodal pricing perspective, with a much larger focus on congestion in the grid and how to mitigate volatility in price. Further, the introduction of transmission hedges provides a new risk management tool, which will allow generators to hedge against network congestion.

The predominant overlap in outcomes between generation reforms underway in the market and COGATI is with regards to the reforms targeting transparency. This includes both the increased transparency of new projects as well as the generator notice of closure period. Transparency reforms currently underway could support COGATI's aims of facilitating efficient investment in generation. This harmonisation has been acknowledged with regards to the "Transparency of new projects" reform, but not alongside the "Generator three year notice of closure" reform.

The overlap between the objectives of COGATI to deliver better system security in the NEM through coordinated investment should be considered in tandem with the reforms underway surrounding primary frequency response requirements, as well as the Finkel Review reforms recently completed regarding system strength. COGATI may reduce the need for these reforms in the market if its impact on system security is tangible. Progressing COGATI without considering benefits provided by the current system security reforms could risk redundant benefits in the market.

Networks

COGATI is set to have a large impact on the way that TNSPs invest and interact with generators. Given the shift in incentives for TNSPs, there is a degree of overlap with other incentive schemes currently in place as well as the Regulatory Investment Test for Transmission (RIT-T) determination process. Looking at reforms that are currently underway, the impact of COGATI on how the DMIS will function needs to be considered further by the AEMC, as there is little reference in the analysis other than to mention that COGATI will effectively replace the need for multiple incentive schemes.³⁶ Understanding how the DMIS could function under this new regime is important, as there could be concerns if investment signals for TNSPs are confused or conflicted under COGATI with existing incentive schemes in place.

6.3 External factors

It is also important to review the interactions that COGATI could have with the external market factors discussed previously.

While there is little overlap or conflict between the operation of the gas market and COGATI (as the incentives for generation are impacted regardless of the generation type), there is significant interaction with the retail market within the NEM. Contracting dynamics will change as generators hedge against congestion and nodal pricing, whereas load is potentially still settled on a regional reference price. As mentioned above, the impacts of COGATI on contract market liquidity could cause an increase in contract prices offered by generators.

³⁶ *ibid.*

Planned transmission upgrades should also be considered in the context of COGATI. AEMO's ISP provides a guideline for future investment in the transmission network which may or may not line up with the intention of COGATI to have investment guided by the purchase of transmission hedges. Ensuring that COGATI and the ISP have aligned views on the transmission network is necessary in order to ensure that the appropriate messages are being relayed to the market.

Regarding both federal and state government policies, the breadth of COGATI means that governments will need to be acutely aware of how their intended policy positions will impact on COGATI (or conversely, the AEMC needs to consider how COGATI can accommodate these positions). Similarly, projects being funded under government incentives or programs will need to confirm they remain commercially viable under the proposed changes.

6.4 Interaction with NEM2025

The NEM2025 review being undertaken by the ESB has the potential to fundamentally alter the market design of the NEM. Any potential market design arising from NEM2025 will require an extensive assessment across the electricity supply chain and an understanding of the impacts that this design will have on the long-term efficiency of the market and its flow-on effects to consumers.

While there have been no explicit market designs explored by NEM2025 at this stage of the review, the scope is far-reaching. This could include consideration of more centralised planning approaches, as well as increased regulatory oversight into the existing market. The ESB has flagged that careful consideration will need to be given to risk allocation in the market.³⁷

Simultaneous progression of COGATI by the AEMC and NEM2025 by the ESB raises questions regarding whether the two reforms can remain congruent. Continuing to develop these major reform packages separately could lead to a situation where market arrangements are introduced that are redundant or inconsistent with each other. This could result in consumers bearing inefficient costs.

As an example, if the NEM2025 process leads to the development of a capacity market, this could potentially reduce the need for a market-based mechanism (i.e. COGATI) to coordinate transmission investment depending on how centrally planned and controlled this new market would be. Capacity payments could introduce locational components in order to increase the efficiency of generation investment, and the changes to bidding behaviours under a capacity scheme could remove disorderly practices without the need for changes proposed under COGATI.

Aligning governance in large-scale reforms

Ultimately, the split in governance between the two reforms poses a question around boundaries of responsibility and accountability and how to best proceed with these large-scale reforms. As outlined previously, pursuing both COGATI and NEM2025 under separate processes may result in inefficient market designs that create added costs for participants and consumers. It will be vital for the AEMC and ESB to work closely together in order to align market designs under the two reforms. This situation highlights the growing complexity underpinning the policy landscape in the NEM and the important role of governance within this landscape. We understand AEMC staff are members of the NEM2025 working group and these organisations are aware of the need to work together closely.

While coordinating multiple electricity market reforms is a complex task, it is becoming increasingly important to understand the function of the NEM as a whole given the growing complexity of the market. Questions that underpin the introduction of new reforms, such as the presence of a market failure, and achievement of the NEO, need to be considered in tandem with questions of how a reform interacts within a larger policy space and its place amongst this landscape. In future,

³⁷ Energy Security Board, *Post 2025 Market Design for the National Electricity Market (NEM)* (2019)

congruency analysis will be an important tool towards ensuring the promotion of reform packages that work together in the long-term interests of consumers.

Appendix A: Selected rules and reforms

A.1 Selection criteria

As there are a large number of reforms and reviews completed or underway in the market, a set of rules must be unbiasedly selected to ensure the assessment is relevant and manageable. The following selection criteria was determined.

Rules and reforms must:

- primarily relate to the electricity market;
- relate to internal factors in the NEM that impact participant behaviour;
- have a status of pending, under consultation or 'open'; and
- if completed, must be pending implementation at a future date or completed since the start of this study (1 March 2019).

A.2 Selected rule changes and reforms

The following page shows an overview of the selected rule changes and reforms to be included in the assessment framework. In total there are 23 selected rules which have been categorised into wholesale market (9), contracting (4), generation (8) and network (2). The low number of network reforms considered is due to the AEMC only progressing two current reforms while the majority of other network reforms sit as external factors (e.g. RIT-T determinations) and have not been included.

Table 6: Selected rules and reforms for analysis

Category	Title	Proponent	Rule status	Phase	Initiated	Determination	Commenced
Wholesale market	Application of the Regional Reference Node Test to the RERT	AEMO	Under consideration	Consultation paper	4/04/2019	(10/10/2019)	
	Threshold for participant compensation following market intervention	AEMO	Under consideration	Consultation paper	4/04/2019	(10/10/2019)	
	Intervention compensation and settlement processes	AEMO	Completed		4/04/2019	30/05/2019	2019-05-30, 01/07/2021
	Enhancement to the Reliability and Emergency Reserve Trader	AEMO	Completed		21/06/2018	2/05/2019	2019-10-31, 26-Mar-2020
	Participant compensation following market suspension	AEMO	Completed		17/05/2018	15/11/2018	2018-11-22, 20/12/18, 1/07/21
	Transmission loss factors	Adani Renewables	Under consideration	Consultation paper	6/06/2019	19/12/2019	
	Wholesale demand response mechanism	Various	Under consideration	Draft determination	15/11/2018	(30/11/2019)	
	Global settlement and market reconciliation	AEMO	Completed		7/06/2018	6/12/2018	
Contracting	Five Minute Settlement	Sun Metals Corporation	Completed		19/05/2016	28/11/2017	1/07/2021
	Short term forward market	AEMO	Under consideration	Consultation paper	11/04/2019		
	Market making arrangements in the NEM	ENGIE	Under consideration	Draft determination	20/12/2018	(16/09/2019)	
	Retailer Reliability Obligation	ESB	Completed		30/10/2017	01/06/2019	1/06/2019
Generation	Voluntary market making	ASX	Completed		30/06/2018	27/06/2019	1/07/2019
	Transparency of new projects	AEC	Under consideration	Draft determination	18/04/2019	(24/10/2019)	
	Generator three year notice of closure	Dr Kerry Schott AO	Completed		10/05/2018	8/11/2018	
	Generator registration thresholds	AEC	Pending				
	Primary frequency response requirement	Dr Peter Sokolowski	Pending				
	Removal of disincentives to primary frequency response	AEMO	Pending				
	Monitoring and reporting on frequency control framework	AEMO	Completed		30/05/2019	(25/07/2019)	
Networks	Improving transparency and extending duration of MT PASA	ERM Power	Under consideration	Consultation paper	18/07/2019		
	System restart services, standards and testing	AEMO	Pending				
Networks	Maximum reactive current during a fault	Renewable Energy Revolution	Pending				
	Demand management incentive scheme and innovation allowance for TNSPs	Energy Networks Australia	Under Consideration	Consultation paper	1/03/2019	(30/12/2019)	

A.3 Summary of selected rules

A.3.1 Wholesale market

Application of the Regional Reference Node Test to the Reliability and Emergency Reserve Trader

Objective

More precise application of intervention pricing, while increasing certainty for market participants.

Background

The regional reference node (RRN) test is used by AEMO to determine whether to apply intervention pricing when it issues a direction (a form of market intervention). Intervention pricing is used to minimise market distortion arising from intervention events. It does this by preserving the price signals that would have been seen by the market if not for the intervention.

The RRN test is not met if the direction relates to a localised issue only and therefore intervention pricing would not apply.

Proposed rule change

Currently the RRN test only applies to directions, however, AEMO has proposed that the RRN should apply for all AEMO intervention events, including the RERT (where intervention pricing is automatically applied). This would require AEMO, when activating the RERT, to apply the test and determine whether intervention pricing should be applied. For example, if the RERT were activated in order to address a localised rather than a region-wide issue, intervention pricing may not apply.

Potential outcome

- The proposed rule would prevent the application of higher intervention prices for all intervention events where there is no value in a scarcity price signal at the RRN. This has the potential to reduce costs for consumers.
- It would also remove uncertainty over the appropriate AEMO approach where different options (direction or RERT) have different market price outcomes.

Threshold for participant compensation following market intervention

Objective

Ensuring participants are appropriately compensated for market intervention, which will provide market participants with certainty.

Background

Following a market intervention event by AEMO (through either a direction or the activation of the RERT), a participant is entitled to claim monetary compensation from AEMO for the amount that puts it in the position that it would have been had the intervention not occurred. Directed participants may claim additional compensation if that amount was insufficient to cover its direct net costs and lost revenue.

This compensation is determined on a 'per trading interval' basis and has a minimum threshold of \$5,000. Market intervention events can occur for more than 12 hours and thus would be considered over several consecutive trading intervals. For example, if the assessed compensation is \$4,000 per trading interval over 12 hours, the cost accumulated would be nearly \$100,000 but the compensation payable would be zero.

Proposed rule change

AEMO has proposed to change the 'per trading interval' to 'per market intervention event' to ensure participants are not under-compensated. This would also make the \$5,000 threshold irrelevant.

Potential outcome

- Efficiently incentivise participants to work collaboratively with AEMO without having to weigh this against the risk of financial losses from an intervention event.
- Increased certainty for participants that they will be fairly compensated for actions that support the reliability and security of the power system.
- Removal of any incentive for participants to avoid or minimise financial losses that may accrue due to interventions, potentially in ways that compromise AEMO's ability to manage the power system.

Intervention compensation and settlement processes

Objective

Streamline administrative process, increase transparency and consistency of the intervention compensation and settlements process.

Background

The AEMC recently introduced a new rule for participant compensation following market suspension. AEMO's proposed drafting in its rule change request did not incorporate this new compensation framework, which was not yet in place at the time. This new compensation framework forms part of the broader intervention compensation framework.

Proposed rule change

The final rule provides a 15 day deadline for additional compensation claims for both directed participants, affected participants and market customers. Secondly, this reform changes the settlement timetables from 100, 150 and 200 business days to 20 and 30 week settlement periods.

Potential outcome

- The best available metering data is now used in the calculation of compensation quantities, through the alignment of compensation determinations with the settlement revision timetable;
- The practicality of the timetable for AEMO and participants is improved, and compliance risk for AEMO is mitigated by aligning intervention compensation payments with the settlement revision timeline for each billing week in which an AEMO intervention event occurred.
- Consistency and certainty is provided in the application of the compensation rules to all AEMO intervention events, irrespective of category and duration.

Enhancement to the Reliability and Emergency Reserve Trader

Objective

Increase transparency of the RERT process and enable AEMO to more efficiently procure resources while minimising costs for consumers.

Background

The RERT is a last resort mechanism that allows AEMO to pay a premium for additional capacity to be on stand-by in case of emergencies when the demand and supply balance is tight. When sourcing capacity, AEMO typically sets up RERT panels of providers for both the medium-notice and short-notice RERT to pre-negotiate complicated aspects of the contracts. However, AEMO can only enter into an emergency reserve contract when it has identified a projected shortfall. It can then seek offers from RERT panel members.

Consumers have expressed concerns with the lack of transparency about the procurement and use of emergency reserves and its impact on electricity bills. Therefore, the AEMC considers that there is a need to enhance the emergency reserve framework to provide AEMO with the flexibility it needs to meet the operational challenges arising from the transition, while containing the costs of doing so.

The AEMC has been working with the ESB on the development of the rules to give effect to the RRO.

Proposed rule change

The AEMC introduced a range of new features to the RERT to improve efficiency. These include:

- Clarifying the RERT trigger, such that it is now linked to the reliability standard.
- Increasing the procurement lead time from nine to 12 months.
- Clarifying the out-of-market provisions - so that reliability is delivered at lowest cost to consumers, including by minimising the risk of gaming by reserve providers.
- Costs of emergency reserves will be recovered, where possible, from customers who caused the need for the RERT.
- AEMO will provide regular updates on how the RERT is procured and used, and how much it costs.

Potential outcome

- Provide transparency to market participants of when and how RERT will be used, as well as providing flexibility to AEMO as to how many reserves it can procure.
- Broaden the pool of RERT providers, allowing emergency reserves to be procured at lower cost for consumers, and provide an incentive for demand response.
- Assist market participants and consumers in planning for RERT costs.

Participant compensation following market suspension

Objective

Minimise the potential for perverse incentives that could lead to inefficient outcomes through ensuring participants are fairly compensated during market suspension.

Background

During market suspension, AEMO can set prices as normal or, if this is not possible, set spot and ancillary service prices in accordance with the market suspension pricing schedule (MSPS) which is based on average prices over the preceding four weeks.

During the South Australian market suspension, some participants were incentivised to minimise financial losses due to the low priced MSPS by withdrawing or reducing their availability for dispatch. As a result, AEMO was reliant on participant goodwill or issuing directions to manage system restoration and operation. This goes against the NER principle which states AEMO decision-making should be minimised to allow market participants the greatest amount of commercial freedom to decide how they will operate in the market

Proposed rule change

The compensation framework will apply if, during a market suspension, prices are set by the MSPS rather than by the normal central dispatch and pricing process.

The aim of the framework is to ensure that, when prices in the MSPS are too low to cover generators' short run costs, compensation is available so that generators do not incur a loss. This is designed to remove the current incentive for generators to withdraw from the market and await direction by AEMO when MSPS prices are low.

Potential outcome

- Provide AEMO with more certainty of generation during market suspension, having removed the disincentives for market participants to minimise financial losses.

Transmission loss factors

Objective

Ensuring efficient allocation of intra-regional settlement residues (IRSRs), and improving the accuracy and transparency of loss factors in order to reduce inefficient market design.

Background

MLFs are used to adjust electricity spot prices set at a Regional Reference Node (RRN) to reflect electrical losses between the RRN and a relevant connection point. The MLF values are applied to the market settlements in the NEM which correlate with a generator's revenue. AEMO is required to calculate and publish MLFs by 1 April each year. The MLF is applied to each generator for the next 12 months from 1 July until 30 June.

Currently intra-regional residue settlements are only given back to TNSPs in order to reduce TUOS charges. However, this means that only market customers benefit from these residues and not generators.

Proposed rule change

The rule change proposed has two main components:

- Allocate IRSRs equally to both generators and network users who are subject to non-locational prescribed TOUS charges.
- Update the MLF methodology to an average loss factor methodology order to reduce these inaccuracies. The inaccuracy in forecasting MLF for the following year/s results in generators assuming an artificially increased bid price as a result of an incorrect MLF. Hence generators are subject to an increased risk of not being dispatched, resulting in an increased cost of generation to all market customers.

Proposed outcomes

- Costs on generators as a result of inaccurate MLFs are reduced through reallocation of IRSRs, leading to more competitive outcomes and lower bidding prices.
- Generators have more transparency over their expected loss factors, leading to increased investment certainty and price signals in the market.
- TUOS charges may increase as a result of the redistribution of settlement residues, however this should be balanced in the long-term through more competitive bidding and a reduction in inaccurate loss factor calculation.

Wholesale demand response mechanism

Objective

Facilitate the uptake and efficient trading of demand response in the NEM through the introduction of a wholesale demand response mechanism into the market.

Background

One recommendation made in the Reliability Frameworks Review was to enable demand response aggregators and providers to be recognised on equal footing with generators in the wholesale market and so offer wholesale demand response transparently into the market. Current issues include:

- The interaction between most consumers and the wholesale market is managed directly by a retailer, and so if the retailer doesn't offer a demand response product then consumers have no incentive to change their consumption.
- There are difficulties for third party demand response providers to provide demand response products to consumers, either because of commercial barriers to enter the retail market, or difficulties gaining and maintaining the value of wholesale demand response.
- There are challenges associated with third party demand response providers needing to be either registered as a retailer or have a commercial relationship with a retailer to provide wholesale demand response as it does not facilitate integration of demand response in the NEM.

Proposed rule change

There are three rule change requests that have yet to be consolidated, these are:

- Introduce a wholesale demand response mechanism in the NEM and create a new category of market participant in the NEM: the demand response service provider (DRSP).
- Requiring AEMO to maintain a register of the demand-side capabilities of registered DRSPs
- Introduce a separate, transitory market for wholesale demand response.

Potential outcome

- Providing consumers with greater opportunities to participate in wholesale demand response.
- Providing greater transparency of demand side participation to other market participants which will help market participants to make more efficient decisions in both operational and investment time frames on both the supply and demand side of the market.
- Improving the reliability of the power system through a reduction in demand and lowered need for interventions in the market.
- Increased transparency of demand response for AEMO to assist with forecasting and operation of the grid.

Global settlement and market reconciliation

Objective

Reallocate losses caused in the distribution network to better align incentives and promote competition between retailers.

Background

The current settlement framework, 'settlement by difference' was designed at a time when local retailers supplied electricity to all small customers. This approach means that the 'local retailer' for a distribution area bears the risk for all unaccounted for energy (UFE) in its area. UFE includes unaccounted for technical losses, estimation errors and commercial losses. Of these contributors to UFE, local retailers are only able to manage their own commercial losses.

Proposed rule change

The final rule moves settlements of the demand side of the wholesale electricity market from the current 'settlements by difference' framework to a 'global settlements' framework. The final rule:

- Places a reporting requirement on AEMO to analyse and make recommendations on how to reduce unaccounted for energy.
- Incentivises retailers to minimise unaccounted for energy, such as electricity theft.
- Creates a more equal platform for competition in the retail electricity market by allocating unaccounted for energy to all retailers within each local area based on their customers' consumption within the area.

Potential outcome

- Improved transparency, leading to fewer settlement disputes and lower levels of UFE over time
- Better facilitation of competition through sharing of market inefficiencies and more efficient allocation of UFE risk, leading to better outcomes for consumers.
- Since all retailers will be responsible for UFE, there is a greater incentive to reduce UFE. Therefore, there is an expectation that UFE will drop under the global settlement framework

Five minute settlement

Objective

Reduce distortions and inefficiencies in wholesale market bidding through shifting settlements to a five minute basis in line with spot price determination in the NEM.

Background

A physical requirement of power systems is that demand and supply must always be instantaneously balanced. Ideally, as demand and supply vary continuously, the price signal would also vary continuously. A market where the price signals provide incentives to respond to supply and demand changes over the shortest timeframe practicable, will provide more efficient wholesale market outcomes.

At the inception of the NEM, the data processing and metering limitations did not facilitate a 5 minute settlement period and so the 30 minute settlement period was chosen instead. These technical limitations no longer apply.

Proposed rule change

Under this rule change the time interval for financial settlement in the NEM will be reduced to five minutes so as to align financial settlement with operational dispatch.

Wholesale prices directly influence the type, scale and location of technology installed, in response to changing power system conditions. They also provide a signal for the efficient consumption of electricity and efficient investment in generation and demand side technologies.

Potential outcome

- Improved price signals for generation more able to respond to five minute price signals, such as batteries and pumped hydro.
- Potential decrease in contract market liquidity through reduced ability for certain forms of dispatchable technologies to cover five minute cap contracts.
- Increase in demand response uptake in conjunction with a short-term forward market to allow for risk hedging.
- Reduced distortion in market bidding through removing perverse incentives to withhold capacity to artificially raise the settlement price.

A.3.2 Contracting

Short term forward market

Objective

Introduction of a short-term forward market in order to provide further risk management options for generators and increase contract market liquidity.

Background

AEMC's Reliability Frameworks Review investigated the appropriateness of a short-term forward market for the NEM based on recommendations from the Finkel Review. This found potential for implementation of a European-style STFM to increase contract market liquidity and improve price certainty and transparency. AEMO were recommended by the AEMC to undertake work prior to a rule change request on development of this market.

Proposed rule change

The proposed rule change would introduce a STFM to be run by AEMO to allow generators and market customers to hedge risk on a short-term basis through a set of anonymised standard forward contracts. Participation would be voluntary and trade on a daily rolling basis up to a week in advance.

Potential outcome

- The introduction of the STFM is expected to provide intermittent renewable generators with an option to sell more valuable financial derivatives on a short-term basis given the increase in generation certainty at these time intervals.
- The STFM can also provide gas generators with more certainty in pricing through coordinating gas supply contracts with STFM contracts.
- Demand response can be encouraged through the introduction of an STFM as it provides demand response providers with an options to on-sell hedges in response to high price expectations.
- The STFM should increase the contract market liquidity through providing another means to hedge risk in the market, therefore improving competition and lowering pricing for contracts in the market.

Market making arrangements in the NEM

Objective

Introduce a centralised tender process for voluntary market making services in the NEM in order to improve contract market liquidity.

Background

Contract market liquidity is defined through metrics such as the number of days of contract trading, the number of trades, contract turnover and churn, and bid-ask spreads for contracts. Market making arrangements are where allocated market makers offer standardised contracts into the market with fixed bid-ask spreads in order to encourage more trading of contracts and increase liquidity. The rule change from ENGIE is primarily in response to low contract market liquidity in South Australia.

Proposed rule change

The market making arrangements proposed would use a centralised tender process run every three to five years by AER to identify market makers. Participation in the tender would be voluntary, and successful parties would then provide a range of contracts in the market with fixed spreads and periods of offer. The costs of the tender process would be recovered through customers, and the proposal is thought to make compulsory market making triggered under the RRO as unnecessary.

Potential outcome

- The market making arrangements are designed to increase contract market liquidity, particularly in states such as South Australia where there is a low number of contracts being offered.
- Through allowing financial intermediaries to participate in the scheme, risk allocation in the contract market would be altered.
- Increased contract market liquidity would lower the barriers to entry for new participants in the retail market.

Retailer Reliability Obligation

Objective

Improve reliability in the electricity market through requiring retailers to demonstrate firm contract positions during times of forecast shortfalls.

Background

The RRO is an offshoot of the originally proposed NEG, which consisted of two components – an emissions guarantee and reliability guarantee. While the emissions guarantee was not progressed, the reliability guarantee component was relabelled as the RRO and progressed through COAG. This was implemented by the ESB.

Proposed rule change

The RRO is a trigger mechanism that comes into effect when AEMO identifies a capacity shortfall in the market that is three years (or less) out. When triggered, retailers in the region will have until T-1 year to secure firm contracts that cover their contracted load during that shortfall period. If this has not adequately occurred by T-1 year, AEMO can enact the RERT process to procure its own capacity. The costs of this RERT process would be recovered according to the retailers who failed to demonstrate sufficient contract coverage. The RRO also features a MLO from T-3 to T-1 year, where sufficiently large retailers are mandated to offer fixed bid-ask spreads in the market for contracts relevant to the shortfall period.

Potential outcome

- The RRO is expected to increase transparency of shortfalls forecast by AEMO in the market and ensure that reliability is maintained in the NEM.
- Contract market liquidity is improved through the MLO mechanism, coming at a cost to the mandated retailers in the region in order to offer these products.
- Retailers are expected to hold more long-term contracting positions in the market in order to cover expected shortfalls and avoid liability under the RRO.
- Demand response is encouraged through longer-term contracting and eligibility as a covering contract under the RRO guidelines.

Voluntary market making

Objective

Voluntary market makers provide fixed bid-ask spreads to the market in order to increase contract market liquidity in exchange for discounted exchange fees and a share of value from increased trade.

Background

In order to increase liquidity in the market for electricity futures and derivatives, the ASX commenced a process to introduce voluntary market making services. This would reduce the need for compulsory market making to be introduced at a future date, which would come at a much higher cost to participants. The scheme was introduced in July 2019.

Proposed rule change

Selected market makers (through a voluntary process) offer fixed bid-spread quotes for standardised futures products (e.g. caps, swaps) into the ASX24 platform. In exchange for offering these services, market makers are incentivised with discounted exchange fees and a share of value from increased trade in the market. Compliance with a market making agreement with the ASX is measured annually, and there is an initial period of 2 years before further market makers can be appointed after the initial appointment in the scheme. Market making can be suspended during times of high volatility or extraneous times in the market in order to reduce the cost of market making.

Potential outcome

- The voluntary market making scheme is expected to increase contract market liquidity across the NEM, particularly in regions such as South Australia which have low levels of liquidity.
- Increased contract market liquidity would lower barriers to entry for new entrants in the retail market through higher transparency and better bid-ask spreads available for hedging purposes.

A.3.3 Generation

Transparency of new projects

Objective

Increase the transparency of information surrounding new projects entering the NEM in order to assist new entrants by lowering barriers to entry and development costs, as well as improving overall efficiency of AEMO in managing forecasts.

Background

New projects must submit a range of important information publically once a connection agreement has been signed. However, prior to this, there is little transparency around information prior to this time. This information is crucial to power system forecasts, development studies for new projects, and network studies. Three rule changes were submitted to the AEMC regarding the increase of transparency for new projects, which have been consolidated into a single consultation.

Proposed rule change

The rule change is made up of three parts according to the originally separate requests. Firstly, the definition of Intending Participant is altered in order to allow information to be published by project developers who may not fall under the current definition by not intending to be the eventual owner of the asset. The second part of the rule change intends to codify AEMO's generation information page and expand AEMO's responsibility for keeping project information up to date through notification by developers on changes in projects and publically available information. The final part of the rule change is to allow TNSPs to public basic and non-commercially sensitive information about projects with a connection enquiry application.

Potential outcome

- Increased transparency around new prospective projects will lower the barrier to entry for new entrants and increase efficiency in development and investment into the NEM.
- Transparency will also improve AEMO's forecasting ability and operational processes.
- Existing generators will have heightened visibility over new entrants into the market, which can improve the efficiency of decision-making around operational processes or decommissioning.
- Improved connection application information will create a more efficient connection process and result in more efficient investment into various regions of the NEM (including renewable energy zones).

Generator three year notice of closure

Objective

Improve transparency, investment signals, and operational efficiency in the NEM by mandating generators to provide at least three years notice before closure of a plant.

Background

A recommendation was made during the Finkel Review for there to be more visibility over the retirement of large assets in the market in order to prevent unexpected exits (e.g. Hazelwood) with insufficient time for replacement capacity to come online. Currently there is no expectation for prior notice before closure of a generating asset, which has led to reliability concerns particularly for coal-fired generators.

Proposed rule change

Scheduled and semi-scheduled generators need to inform AEMO of their expected closure year, with at least three years notice unless granted an exemption by AER. AEMO will then maintain and publish the expected closure dates for generating units and incorporate into its forecasts.

Potential outcome

- Improved certainty for market participants around their operational processes in the face of potential closures.
- Improved price signals for new entry generation into the market, and better investment certainty for new entrants.
- Better ability for AEMO to forecast potential reliability concerns in the market due to closures.

Generator registration thresholds

Objective

Lower the size threshold for scheduled and semi-scheduled generation registration from 30 MW (nameplate capacity) to 5 MW, and improve transparency surrounding changes in generator classification.

Background

Currently, only generators above 30 MW must be classified as scheduled or semi-scheduled. Generators below 5 MW are exempted from registration, and those above 5 MW can have discretionary exemptions. In response to the reclassification of two generating systems (combined capacity of 277 MW) from scheduled to non-scheduled, the AEC submitted a rule change to lower the threshold for registration and make clearer the reasoning behind reclassifications.

Proposed rule change

The rule change reduces the threshold for scheduled and semi-scheduled generation registration to 5 MW. Exemptions to classification will still be allowed, but AEMO is obligated to publish the reasoning for doing so. Further, generators must be considered on a system basis for the classification rather than a per unit basis.

Potential outcome

- Increased efficiency in AEMO's dispatch process given the increase in generating units below the current 30 MW threshold.
- More accurate forecasting information provided to the market.
- More transparency over AEMO's decision-making processes with regards to classification of generators and exemptions granted.
- Better management of network congestion through the dispatch process given the increased visibility of smaller generating units in a given area.

Primary frequency response requirement

Objective

Improve power system security and frequency control in the NEM by mandating primary frequency control to be implemented by generators.

Background

Currently, governor frequency response in generators provides frequency support to the system through responding to changes in frequency when they arise. However, these governor systems are able to be detuned or switched off in order to allow the generator to more easily respond to dispatch signals and increase operational efficiency without the need to respond to frequency changes. This has led to a deterioration of system frequency in the NEM leading to security concerns.

Proposed rule change

The proposed rule change would mandate generators to have their governor frequency response active, effectively mandating primary frequency control across the system. This would remove any incentive for generators to be non-responsive to frequency changes in the system. The rule change also introduces recognition for fast frequency response services as equivalent to inertia support for inverter connected plants.

Potential outcome

- Reduce the amount of load shedding during contingency events caused by under-reliance on governor control in the system.
- Improve overall system security through more active frequency response by generators.
- Decrease the size and payments from the FCAS market through mandating a certain level of frequency response from all generators.
- Improve the operational efficiency of all assets through lowering the amount of frequency deviations in the system.

Removal of disincentives to primary frequency response

Objective

Prevent further decline in system strength through removing perverse incentives causing generators to limit their provision of primary frequency response.

Background

Primary frequency response provides automatic support from generators in response to minor system frequency deviations during operation of the NEM. However, increasing deviations can cause higher operating costs for generators, and it becomes more difficult to meet dispatch targets when there is significant deviation in the system. As a result, generators are increasingly limiting or reducing the provision of primary frequency response, leading to a decline in frequency support in the grid.

Proposed rule change

AEMO propose to remove the disincentives in the market through a change to the NER specifying that dispatch targets which are not met as a result of providing primary frequency response are permissible. Further, AEMO propose to implement provisions that ensure that liability for FCAS costs is removed when a generator is providing primary frequency response.

Potential outcome

- Increase the overall system security of the NEM through encouraging more provision of primary frequency response in the market.
- Decrease the size and payments from the FCAS market through mandating a certain level of frequency response from all generators.
- Improve the operational efficiency of all assets through lowering the amount of frequency deviations in the system.

Monitoring and reporting on frequency control framework

Objective

Improve transparency around frequency performance and FCAS market information through ongoing reporting requirements by AEMO and AER.

Background

In AEMC's Frequency Control Framework Review, there was a conclusion that there was a lack of transparency regarding the general performance of FCAS markets and the frequency performance of the power system under normal operating conditions. In response, the AER submitted a rule change request surrounding reporting on FCAS markets. AEMO also submitted a rule change request in relation to reporting on frequency performance in the system. These rule changes were consolidated into a single request given the similarity of topics. Currently, reporting on these two topics is only required for extenuating circumstances or incidents or high price events in the FCAS market.

Proposed rule change

The rule change request has two primary components. Firstly, the AER would need to publish quarterly reporting on the total costs of FCAS, volumes, prices, and participants, and commentary on key trends in the FCAS market. Secondly, AEMO would need to publish weekly reports on the frequency performance of the grid against a series of metrics and FCAS dispatch information. AEMO would also need to produce quarterly reports on intervention for frequency control, rates of change of frequency during contingency events, automatic governor control estimates of power to correct deviations, and operating incidents.

Potential outcome

- Increased access to FCAS market information and visibility on costs to meet frequency requirements.
- Clearer price signals for investment and operational decisions regarding participation in the FCAS market.
- More certainty to stakeholders surrounding the accessibility of FCAS and frequency control information on an ongoing basis.

Improving transparency and extending duration of MT PASA

Objective

Increase the transparency around data contained within MT PASA forecasts and alter calculation methodologies in order to improve the quality of information given to participants, as well as extend the forecast period from 24 to 36 months.

Background

MTPASA provides aggregated forecasts to the market regarding generator availability, allowing participants to better understand the supply-demand balance with a forward looking period of 2 years. This rule change was introduced in response to perceived deficiencies remaining in the MT PASA process that reduce the overall transparency and accuracy of the forecasts. The rule change was consolidated with another proposed change to extend the forecast period to 36 months in order to align with other reforms which have the same lead time (including RRO and notice of closure).

Proposed rule change

The proposed rule change seeks to implement a series of changes to the MT PASA process. Firstly, rather than an aggregated forecast of availability, it is proposed that individual unit availability is published by AEMO (previously not done due to commercial sensitivity reasons). Secondly, changes to the probabilistic results (P10 and P50) published by AEMO are requested, by adding a requirement to publish the P90 data as well in order to reduce bias. Data supplied by generators also should be altered to account for auxiliary generator load. The MT PASA data is proposed to include committed (but not yet operational) generation units in the forecast in order to improve the accuracy of forecasts in the medium-term. Finally, the rule change would seek to change the 24 months MT PASA period to a 36 month period. This would mean that AEMO must forecast an additional 12 months of generator availability in their MT PASA calculation which is published to the market.

Potential outcome

- Increased transparency around individual generator outages, leading to improved operational efficiency for existing generators (particularly in planning for outages) and better investment signals to the market.
- Improved reliability in the system through better quality of information supplied through the MT PASA process.
- Increased contracting liquidity in the third year of forecasting as a result of improved visibility over availability of generators.
- Alignment with existing processes such as the RRO and the generator three year notice of closure, improving the overall visibility and accessibility of data at this three year forward period.

System restart services, standards and testing

Objective

Increase the amount of generation in the market able to offer system restart services and put provision in place for better testing of processes in order to lower costs in the event of a system restart.

Background

System Restart Ancillary Services (SRAS) are procured by AEMO in order to provide system support in the event of a blackout. Previously, this service has been predominately supplied by large synchronous generators such as coal generation. As these generators begin to retire, there has been a decline in the amount of resources able to be procured by AEMO for SRAS purposes, leading to an increase in procurement costs.

Proposed rule change

In order to incentivise more generation that is able to provide SRAS to the market, AEMO have proposed a rule change to modify the definition of black start capability in order to allow new types of services, loosen the procurement objective in order to provide more efficient outcomes, adding the provision of SRAS into the generator performance standards, and extend testing of SRAS by network service providers.

Potential outcome

- Incentivise more generation able to provide SRAS into the market through mandating SRAS to be provided as a condition of access through the generator performance standards.
- Increase overall system security and reliability at efficient costs to consumers through a more efficient SRAS procurement process.
- Development of new services able to provide SRAS capabilities to the market.

A.3.4 Networks

Maximum reactive current during a fault

Objective

Improving voltage control and allowing for greater performance of network lines in response to an increase in intermittent technologies on the grid.

Background

Without the construction of additional transmission line infrastructure, the transition to a cheaper electricity price in Australia requires a large number of generators to be constructed on the 132kV and 66kV networks. This is so that the generators are distributed in harvesting energy, while not too concentrated to overload the existing network.

Proposed rule change

This rule change seeks to change the maximum reactive current value to correctly align the frame of voltage control (voltage support) in remote / weak grids.

The current rule, by demanding 100% 'maximum reactive current', forces the alignment of the voltage support mechanism entirely with the Q-axis. Further, it allows no concession to reduce this value. Note that where the control is incorrectly aligned, generally, the inverters achievable performance will be degraded.

In a weak grid there is the need to compensate for the considerable voltage drop across the resistive network impedance. This can be achieved by limiting the maximum reactive current, and thus supplying active current, in a Q priority inverter. Q priority is used in most inverters installed in Registered Generating systems in the Australian Grid.

Potential outcome

This rule change facilitates the construction of generators by:

- Correctly aligning the voltage support mechanism during faults.
- Allowing improved control performance.
- Improved control action may increase the allowable MW per point of connection (density of power), considering currently observed dynamic limitations.
- Solar and (full converter) wind generators are expected to be affected, and to see improved control in low X/R ratio grids. No additional cost will be incurred, by any parties, under the proposed wording.

Demand management incentive scheme and innovation mechanism for TNSPs

Objective

Extending positive incentives to TNSPs to invest in demand management innovation and reduce the need for physical investment in transmission infrastructure.

Background

A DMIS and a Demand Management Innovation Allowance (DMIA) currently exists for Distribution Network Service Providers (DNSPs) but not for TNSPs. While TNSPs do have some incentive mechanisms such as the Efficiency Benefit Sharing Scheme (EBSS), Capital Expenditure Sharing Scheme (CESS) and Service Target Performance Incentive Scheme (STPIS), these do not allow for demand management.

Proposed rule change

This rule change proposes to introduce a DMIA and DMIS to Transmission Network Service Providers (TNSPs). Energy Networks Australia (ENA) states that a key difference in the regulatory framework applying to TNSPs compared to DNSPs is that TNSPs have a network support pass through codified as part of the NER. While this assists TNSPs to manage risks associated with network support payments that are outside of their control, ENA considers it insufficient by itself since it does not provide a positive incentive to adopt efficient non-network solutions. Further, ENA states the current regulatory framework provides a disincentive to incur expenditure on research and development into new and more innovative techniques for utilising non-network technologies.

Potential outcome

- The DMIS would provide TNSPs with a financial incentive to implement efficient non-network options, which are expected to lower costs to consumers
- The DMIA would provide TNSPs with funding to research and develop innovative non-network arrangements in connection with the operation of their transmission networks, with the prospect of lowering costs to consumers in the longer term

Appendix B: Summary of assessments

A summary of the assessments made (see Step 2 of the coordination framework) is found in the tables below for each category of reform. This describes a brief rationale for the scoring as well as the score given to the pairing.

B.1 Wholesale market

Table 7: Summary of assessments - Wholesale market

Rule #1	Rule #2	Determination	Score
Application of the Regional Reference Node Test to the Reliability and Emergency Reserve Trader	Threshold for participant compensation	While both reforms ensure appropriate pricing is made during market intervention, they deal with separate functions of market interventions with no overlap.	0
	Intervention compensation and settlement processes	This rule is specifically focused on streamlining administrative processes for market intervention. No similar outcomes or objectives.	0
	Enhancement to the Reliability and Emergency Reserve Trader	This rule provides specific provisions for the RERT, none of which involve market intervention pricing. No similar outcomes or objectives.	0
	Participant compensation following market suspension	This rule occurs at a different stage to market intervention and is concerned with compensation rather than pricing, therefore do not share the same scope.	0
	Transmission loss factors	There are no perceived overlaps between the two reforms.	0
	Wholesale demand response mechanism	This rule concerns transparency and accessibility for a type of energy supply 'demand response', while the opposing rule focuses on market intervention pricing applicability.	0
	Global settlement and market reconciliation	There are no perceived overlaps between the RRN test and global settlements.	0
	Five minute settlement	There are no perceived overlaps between the two reforms.	0
Threshold for participant compensation	Demand management incentive scheme for TNSPs	There are no perceived overlaps between the two reforms.	0
	Intervention compensation and settlement processes	This rule is specifically focused on streamlining administrative processes for market intervention.	0
	Enhancement to the Reliability and Emergency Reserve Trader	Both rules relate to the RERT, however they deal with separate aspects and do not have any overlapping outcomes or objectives.	0
	Participant compensation following market suspension	This rule occurs at a different stage to market intervention and is concerned with compensation rather than pricing, therefore do not share the same scope.	0
	Transmission loss factors	This rule concerns ensuring generators are appropriately compensated for electrical losses, while the opposing rule only refers to market intervention.	0

	Wholesale demand response mechanism	This rule concerns transparency and accessibility for a type of energy supply 'demand response', while the opposing rule is concerned with market intervention compensation.	0
	Global settlement and market reconciliation	There is no perceived overlap between the two reforms.	0
	Five minute settlement	Settlements in the wholesale market are not overlapping with the RERT compensation mechanism.	0
	Demand management incentive scheme for TNSPs	There is no perceived overlap between the two reforms.	0
Intervention compensation and settlement processes	Enhancement to the Reliability and Emergency Reserve Trader	There is no perceived overlap between the two reforms.	0
	Participant compensation following market suspension	There is no perceived overlap between the two reforms.	0
	Transmission loss factors	There is no perceived overlap between the two reforms.	0
	Wholesale demand response mechanism	There is no perceived overlap between the two reforms.	0
	Global settlement and market reconciliation	There is no perceived overlap between the two reforms.	0
	Five minute settlement	There is no perceived overlap between the two reforms.	0
	Demand management incentive scheme for TNSPs	There is no perceived overlap between the two reforms.	0
Enhancement to the Reliability and Emergency Reserve Trader	Participant compensation following market suspension	This rule occurs at a different stage to market intervention and is concerned with compensation rather than specific RERT provisions, therefore do not share the same scope.	0
	Transmission loss factors	This rule relates to proper allocation and calculation of IRSR. No similar outcomes or objectives.	0
	Wholesale demand response mechanism	The enhanced RERT is intended to allow DR to be procured by AEMO under the RERT, giving a minor overlap with the introduction of a DRM. This is in the short-term given the RERT is only periodically triggered, and has been acknowledged by the AEMC as a potential positive harmonisation. There are no perceived issues with congruency.	3
	Global settlement and market reconciliation	Involves different sections of the market. No similar outcomes or objectives.	0
	Five minute settlement	Involves different sections of the market. No similar outcomes or objectives.	0
	Demand management incentive scheme for TNSPs	No similar objectives, market or target beneficiaries.	0
	Transmission loss factors	This rule does not relate to market suspension. No similar outcomes or objectives.	0

Participant compensation following market suspension	Wholesale demand response mechanism	This rule does not relate to market suspension. No similar outcomes or objectives.	0
	Global settlement and market reconciliation	This rule does not relate to market suspension. No similar outcomes or objectives.	0
	Five minute settlement	This rule does not relate to market suspension. No similar outcomes or objectives.	0
	Demand management incentive scheme for TNSPs	This rule change concerns compensation rather than investment incentives.	0
Transmission loss factors	Wholesale demand response mechanism	The opposing reform relates to proper allocation and calculation of IRSR. This rule concerns increasing accessibility and transparency of a type of energy supply.	0
	Global settlement and market reconciliation	There is similarities in allocation of electricity losses, however, this rule is relevant to reallocation of risk to retailers while the opposing rule relate to generators and NSPs.	0
	Five minute settlement	This rule concerns more efficient pricing signals. No similar outcomes or objectives.	0
	Demand management incentive scheme for TNSPs	This concerns ensuring generators are appropriately compensated for electrical losses, while the opposing rule addresses investment incentives for TNSPs. No similar outcomes or objectives.	0
Wholesale demand response mechanism	Global settlement and market reconciliation	This reform is concerned with proper allocation of a universal cost to retailers, while the main reform is concerned with accessibility and transparency on a type of energy supply. Both should increase competition in the retail markets.	0
	Five minute settlement	While the DRM seeks to encourage higher levels of demand response in the market, there are questions regarding the impact of five minute settlements on the prevalence of DR. This represents a minor overlap in the long-term with potentially conflicting signals to participants. There has been acknowledgement on the impact on DR at a high-level, but not with reference to the proposed mechanism.	-4
	Demand management incentive scheme for TNSPs	Both reforms seek to incentivise DR in the NEM through differing mechanisms. This is deemed to be a minor overlap in the long-term. There is a question regarding congruency given the lack of clarity on how baselines are determined under the DMIS and whether this will align with the wholesale DRM. Further, this provides two potentially different price signals for DR in the marketplace for providers. This has not been acknowledged.	-4
Global settlement and market reconciliation	Five minute settlement	The main reform is concerned with fair allocation of unserved energy, a universal retail risk, while this reform is concerned with improving the efficiency of price signals.	0
	Demand management incentive scheme for TNSPs	This reform is concerned with proper allocation of a universal cost to retailers, while the opposing rule is concerned with incentivising TNSPs to invest in demand management.	0
Five minute settlement	Demand management incentive scheme for TNSPs	This rule improves price signals for more efficient investment in capacity and demand response technologies to balance supply and demand. However, the opposing rule is focused on TNSPs investment rather than the free market.	0

B.2 Contracting

Table 8: Summary of assessments - Contracting

Rule #1	Rule #2	Determination	Score
Short term forward market	Market making arrangements in the NEM	Both rules have overlapping outcomes in improving contract market liquidity and contracting levels in the NEM. The mechanisms are different and not a major overlap, but do persist in the long-term. There are questions around accountability given AEMO would run the STFM and AER would run the market making, and there is potential for redundant benefits in market liquidity from implementing both reforms. The overlap has not been acknowledged.	-4
	Retailer Reliability Obligation	The MLO component of the RRO improves market liquidity alongside the STFM, although this is a minor overlap and in the short-term. Given the two reforms encourage liquidity at different timescales (year ahead and week ahead), there is potential for conflicting market signals. The overlap has not been acknowledged.	-3
	Voluntary market making	The determination is similar to “Market making arrangements in the NEM”, although responsibility for contract market liquidity falls with ASX rather than AER (compared to AEMO for the STFM).	-4
	Enhancement to the Reliability and Emergency Reserve Trader	Both reforms deal with improving contracting, but STFM is with wholesale participants and the RERT is with out-of-market participants. No overlap of outcomes was deemed.	0
	Wholesale demand response mechanism	The STFM has a direct outcome of encouraging higher demand response in the market through better ability for DR participants to hedge risk. The overlap is not considered major since encouraging DR is a secondary outcome of the STFM, but does persist in long-term. The two reforms do not raise any immediate questions regarding congruency, and the potential for harmonisation has been acknowledged.	4
	Five minute settlement	Both reforms have outcomes relating to the contract market in the NEM, although these are secondary effects and not major (although persisting in the long-term). While five minute settlements may reduce contract market liquidity, the STFM can allow impacted parties to hedge risk on a short-term basis without sending conflicting signals to participants. There are no immediate congruency questions, although the overlap has not been acknowledged.	2
	Market making arrangements in the NEM	Retailer Reliability Obligation	The MLO component of the RRO and market making arrangements overlap in their objective to increase contract market liquidity through two separate mechanisms. While this is not major or long-term, there is a redundant benefit of the MLO given a continuous market making arrangement. This has been acknowledged by the AEMC.

	Voluntary market making	There is a major overlap between the two market making arrangements, as they seek to implement the same mechanism for the same objective. There are questions raised regarding risk allocation (AER versus ASX), and there may be no additional benefit from the two reforms. This major overlap has been acknowledged by the AEMC.	-3
	Enhancement to the Reliability and Emergency Reserve Trader	The market making arrangements seek to increase contract liquidity, while the RERT enhances AEMO's ability to procure resources. There is no perceived overlap.	0
	Wholesale demand response mechanism	Market making arrangements do not overlap in outcomes from wholesale demand response, which would only increase the ability to contract DR in the market.	0
	Five minute settlement	While five minute settlements may negatively impact contract liquidity and lower the ability for generators to sell contracts, this may send a conflicting signal to market making, which requires higher levels of contracting. While the overlap is not major (a secondary effect of five minute settlements), it persists in the long-term and has not been acknowledged.	-4
Retailer Reliability Obligation	Voluntary market making	The determination is similar to between Retailer Reliability Obligation and "Market making arrangements in the NEM". However, there has been no acknowledgement of the potential overlap.	-3
	Enhancement to the Reliability and Emergency Reserve Trader	The Retailer Reliability Obligation works hand-in-hand with the enhanced RERT to allow AEMO to procure resources a year out from a shortfall. This is a major overlap in outcomes, although only in the short-term given it is only triggered periodically. There is no perceived problems with congruency and this has been acknowledged.	4
	Wholesale demand response mechanism	A secondary impact from the RRO is to encourage more DR as an eligible contract for retailers, overlapping outcomes with a DRM. While this is a minor overlap in the short-term, there is no perceived problems with congruency and the overlap has been acknowledged	3
	Five minute settlement	The overlap is similar to the market making arrangements given the MLO in the RRO and the conflicting market signals regarding contract availability. This only persists in the short-term however.	-3
Voluntary market making	Enhancement to the Reliability and Emergency Reserve Trader	The market making arrangements seek to increase contract liquidity, while the RERT enhances AEMO's ability to procure resources. There is no perceived overlap.	0
	Wholesale demand response mechanism	Market making arrangements do not overlap in outcomes from wholesale demand response, which would only increase the ability to contract DR in the market.	0
	Five minute settlement	This determination is similar to "Market making arrangements in the NEM" regarding the conflicting signals for contract availability in the market.	-4

B.3 Generation

Table 9: Summary of assessments - Generation

Rule #1	Rule #2	Determination	Score
Transparency of new projects	Generator three year notice of closure	Both reforms deal with improving investment signals for new generation through increased transparency measures, and are a major overlap in the long-term. There are immediate questions regarding their ability to work together, and the decision maker has acknowledged their congruency moving forward.	5
	Generator registration thresholds	Both reforms deal with transparency around generators in the market and both improve AEMO's ability to forecast generation in future. This is a minor overlap in the long-term. There are no issues around congruency identified, and no acknowledgement.	2
	Primary frequency response requirement	Primary frequency response seeks to improve system security, which has no overlapping outcomes with transparency of new projects.	0
	Removal of disincentives to primary frequency response	There are no overlapping outcomes between removing disincentives for primary frequency response and the provision of information on new projects.	0
	Monitoring and reporting on frequency control framework	The reporting requirements by AEMO and AER on frequency and FCAS have no overlapping outcomes with more transparency on new entry projects other than a broad increase in information in the market.	0
	Improving transparency and extending duration of MT PASA	The transparency around new projects overlaps in outcomes with the increased transparency around MT PASA, particularly considering the proposal to include committed projects in the projection. There are no immediate questions on congruency, and this is a minor overlap which has not been acknowledged.	2
	System restart services, standards and testing	The transparency requirements on new projects has no overlapping outcomes with the requirement for generators to offer SRAS services to the market.	0
	Transmission loss factors	The increased transparency around MLFs provides better investment signals to proponents, which overlaps with transparency of new projects. This is a minor overlap, but it has been acknowledged by the decision maker with no perceived issues.	4
	Retailer Reliability Obligation	The improved transparency on new projects provides AEMO with further visibility over the initiation of the RRO process. This is a minor overlap in the short-term, and has been acknowledged. There are no perceived issues with the ability for the two reforms to work together.	3

Generator three year notice of closure	Generator registration thresholds	The requirement for extended notice of closure for generators has no overlapping outcome with lowering the threshold for generation registration.	0
	Primary frequency response requirement	Mandating primary frequency response has no perceived overlap with the notice of closure period for generators.	0
	Removal of disincentives to primary frequency response	There is no perceived overlap in outcomes between the two reforms.	0
	Monitoring and reporting on frequency control framework	The requirement on reporting FCAS and frequency outcomes has no overlap in outcomes with the notice of closure period for generators.	0
	Improving transparency and extending duration of MT PASA	There is an overlapping objective for transparency of generation availability at the three year mark between the two reforms, which has been explicitly acknowledged by the proponent. This is a minor overlap given it is only to align the timeframes. There are no perceived issues with congruency.	4
	System restart services, standards and testing	There are no perceived overlaps between the notice period of closure and the incentives for new SRAS in the market.	0
	Transmission loss factors	There is no perceived overlap between accuracy and transparency of MLFs and generator closures.	0
	Retailer Reliability Obligation	The three year forecasting period for AEMO under the RRO aligns with the notice of closure period for generators, as has been acknowledged by the proponent. This is similar to the extension of MT PASA, although only exists in the short-term when the RRO is triggered.	3
Generator registration thresholds	Primary frequency response requirement	While both reforms impact scheduled and semi-scheduled generators, the threshold relates to their definition, while primary frequency response is a separate requirement. There are no overlapping outcomes.	0
	Removal of disincentives to primary frequency response	There are no overlapping outcomes or objectives between the two reforms.	0
	Monitoring and reporting on frequency control framework	There is no overlap between reporting of FCAS and frequency operation and the generator registration thresholds.	0
	Improving transparency and extending duration of MT PASA	Lowering generator registration thresholds improves AEMO's forecasting ability, which contributes to the accuracy of MT PASA forecasts. This is a minor overlap as it is a secondary effect of generator thresholds, and persists in the long-term. There has been no acknowledgement by the proponent.	2
	System restart services, standards and testing	There are no overlapping outcomes between the generator thresholds and the incentives and changes to the SRAS regime.	0

	Transmission loss factors	Changes to MLF forecasting and transparency do not have overlapping outcomes with generator registration thresholds.	0
	Retailer Reliability Obligation	There is no perceived overlap between the function of the RRO and generator registration thresholds.	0
Primary frequency response requirement	Removal of disincentives to primary frequency response	The two reforms are attempting to solve identical issues in the NEM, which is a loss of primary frequency response from generators due to perverse incentives. This is a major overlap in the long-term. There are clear redundant benefits, but the overlap has not yet been acknowledged.	-5
	Monitoring and reporting on frequency control framework	There is a minor overlap in objectives between mandating primary frequency response and reporting on system frequency outcomes, as both seek to improve overall system security. This persists in the long-term but has not been acknowledged. There is no perceived issues with congruency.	2
	Improving transparency and extending duration of MT PASA	There is no perceived overlap between the provision of primary frequency response and the MT PASA process.	0
	System restart services, standards and testing	There is no overlap in outcomes between the provision of primary frequency response and SRAS provision in the market.	0
	Transmission loss factors	MLF methodology and transparency does not overlap in outcomes with primary frequency response provision.	0
	Retailer Reliability Obligation	The RRO seeks to improve reliability, whereas the primary frequency response improves system security. There is no perceived overlap.	0
	Removal of disincentives to primary frequency response	Monitoring and reporting on frequency control framework	Similarly to the primary frequency response requirement, there is a minor overlap in objectives between mandating primary frequency response and reporting on system frequency outcomes, as both seek to improve overall system security. This persists in the long-term but has not been acknowledged. There is no perceived issues with congruency.
Improving transparency and extending duration of MT PASA		There is no perceived overlap between the provision of primary frequency response and the MT PASA process.	0
System restart services, standards and testing		There is no overlap in outcomes between the provision of primary frequency response and SRAS provision in the market.	0
Transmission loss factors		MLF methodology and transparency does not overlap in outcomes with primary frequency response provision.	0
Retailer Reliability Obligation		The RRO seeks to improve reliability, whereas the primary frequency response improves system security. There is no perceived overlap.	0

Monitoring and reporting on frequency control framework	Improving transparency and extending duration of MT PASA	There is no overlap between reporting on frequency and FCAS and the MT PASA process.	0
	System restart services, standards and testing	There is no overlap between the reporting standards for FCAS and frequency and the changes to the SRAS mechanism proposed by AEMO.	0
	Transmission loss factors	The proposed changes to MLF do not have any overlapping outcomes with reporting standards for FCAS and frequency outcomes.	0
	Retailer Reliability Obligation	The RRO does not have any perceived overlap with reporting standards for FCAS and frequency outcomes.	0
Improving transparency and extending duration of MT PASA	System restart services, standards and testing	There is no perceived overlap between the system restart incentives and the MT PASA process.	0
	Transmission loss factors	The MLF methodology and transparency has no overlapping outcomes with the MT PASA changes, which only deal with transparency around generator availability.	0
	Retailer Reliability Obligation	The alignment between the three year period for the RRO trigger and the 3 year timeline for MT PASA projections is a minor overlap which works congruently together in the market. This has been acknowledged by the proponent, although only exists in the short-term (when triggered).	3
System restart services, standards and testing	Transmission loss factors	There is no overlap between the SRAS mechanism and the MLF methodology or changes proposed to it.	0
	Retailer Reliability Obligation	There is no overlap between the system restart incentives proposed by AEMO and the function of the RRO.	0

B.4 Networks

Table 10: Summary of assessments - Networks

Rule #1	Rule #2	Determination	Score
Maximum reactive current during a fault	Demand management incentive scheme for TNSPs	This scheme and mechanism is largely focused on providing TNSPs with incentives to invest in efficient non-network solution, while the opposing rule is concerns voltage control calculations. There is no perceived overlap.	0



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