KPMG

Coordinating electricity market reform

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

Executive Summary

September 2019

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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.

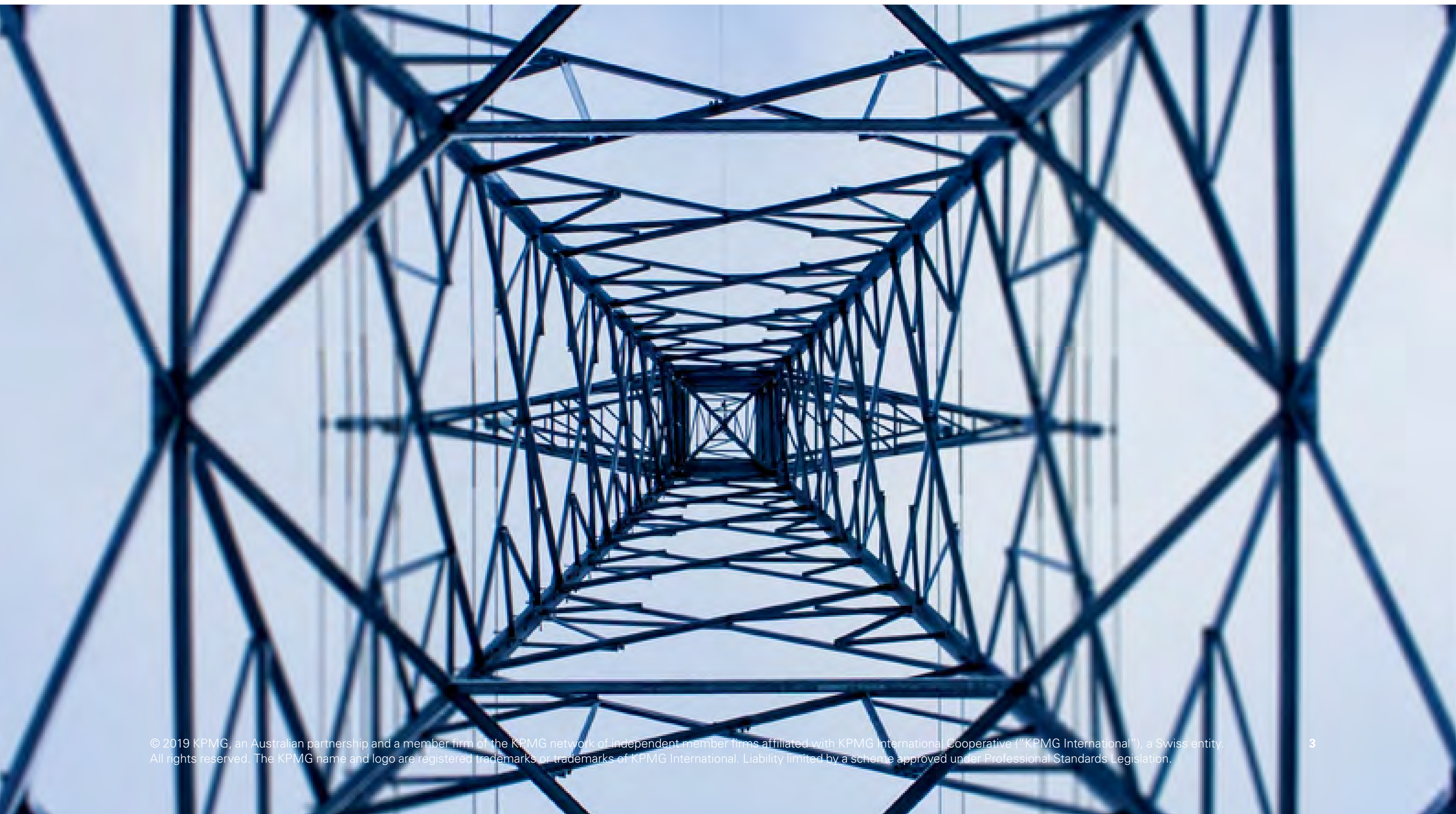
While the Australian Electricity Market Commission (AEMC) continue to progress changes to the National Electricity Rules (NER) and undertake reviews, the formation of the Energy Security Board (ESB) has resulted in a dispersion of market reform responsibility. There is also an increasing level of activity 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.

1 KPMG, *Electricity Market Design Principles* (2018)
2 For example: the Default Market Offer, Victorian Default Market Offer,



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.

While the definition is broad, Congruent reforms typically:

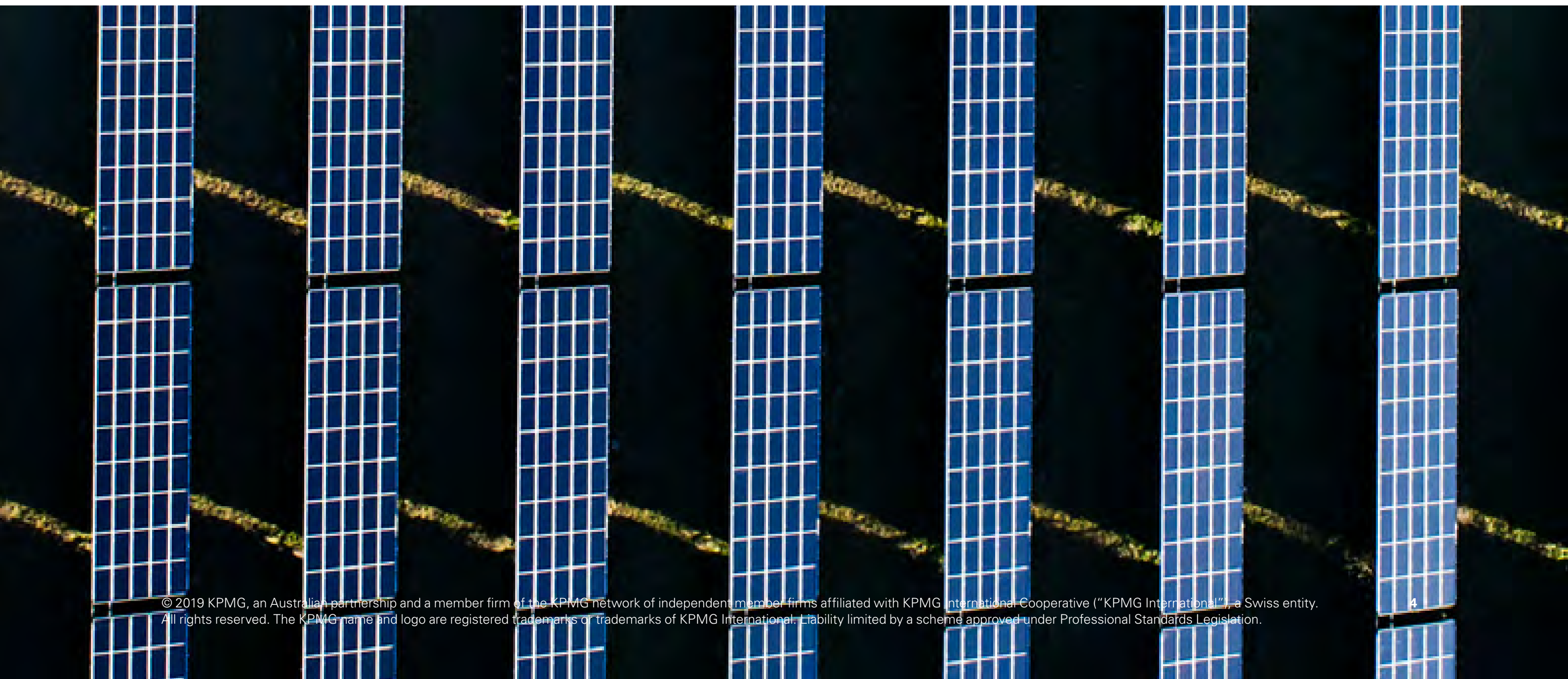
- reinforce market signals to participants;
- allocate risks efficiently and consistently to parties best placed to manage them; and
- deliver unique and complementary benefits to the market and its participants.

Congruent reforms require careful thought by decision-makers and a holistic view on the impacts on consumers. 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.

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]

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.



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

Step 1: Classify

Each rule and reform is placed into a mutually exclusive category according to its outcomes and objectives.

Step 2: Assess

Within each category, individual pairs of reforms are assessed in order to understand their congruency and how they work together.

Step 3: Analyse

The combined assessments in each category are holistically analysed in order to assess outcomes and identify questions regarding congruency and governance.

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 of the report), 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

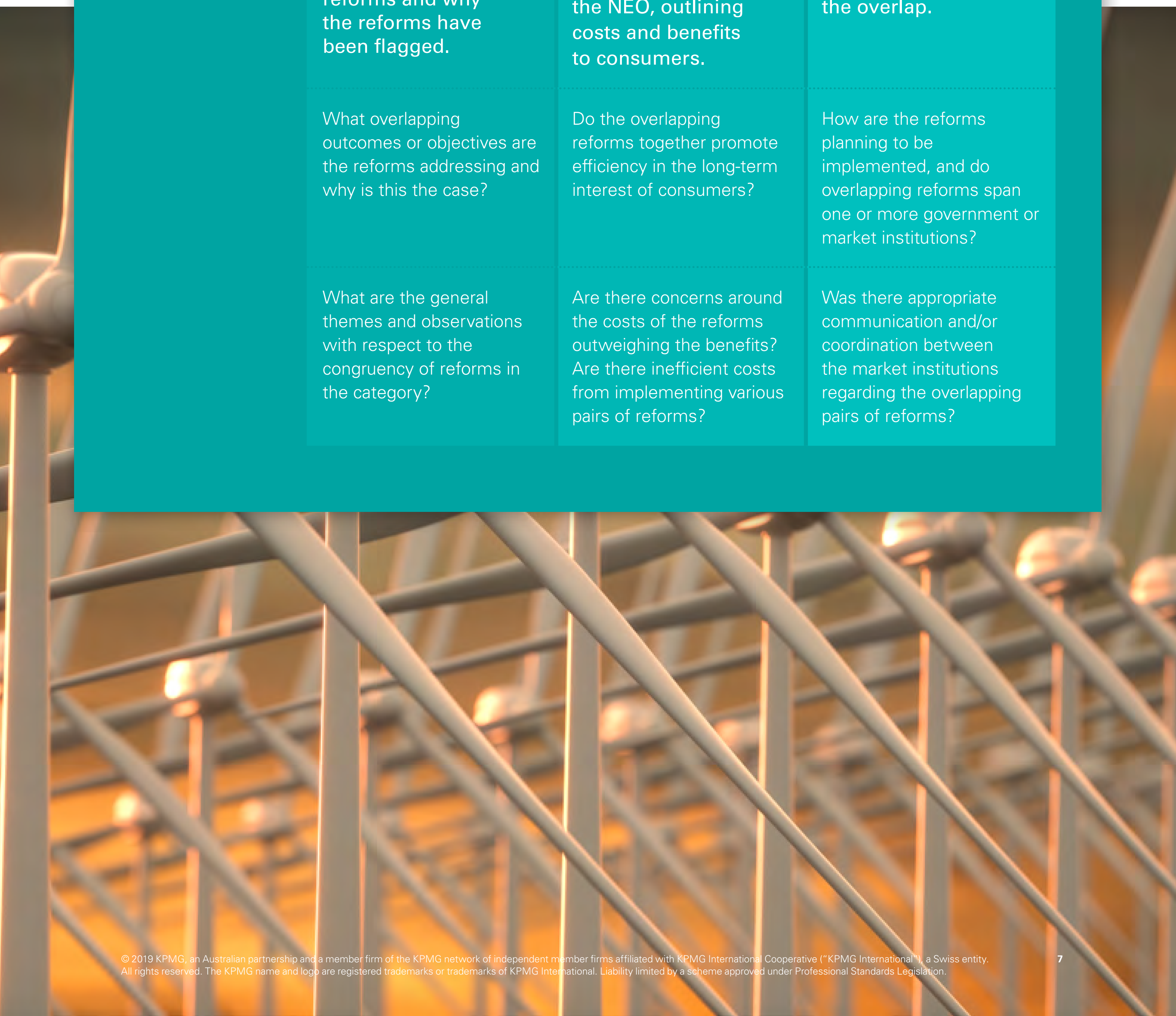
	Reform A	Reform B	Reform C	Reform D	Reform E	Reform F
Reform A		–4	–3	–4	0	0
Reform B			–2	0	4	0
Reform C				0	1	3
Reform D					2	0
Reform E						–1
Reform F						

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 This section covers the general findings between the two reforms and why the reforms have been flagged.	**Impacts to consumers** This section covers how well the pair of reforms reflect the NEO, outlining costs and benefits to consumers.	**Governance** This section covers potential governance reasons underpinning the overlap.
What overlapping outcomes or objectives are the reforms addressing and why is this the case?	Do the overlapping reforms together promote efficiency in the long-term interest of consumers?	How are the reforms planning to be implemented, and do overlapping reforms span one or more government or market institutions?
What are the general themes and observations with respect to the congruency of reforms in the category?	Are there concerns around the costs of the reforms outweighing the benefits? Are there inefficient costs from implementing various pairs of reforms?	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 of the report sets out our findings in detail and Appendix B contains details on individual assessment and scoring. Observations from our analysis are set out below:

1.

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.

2.

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.

3.

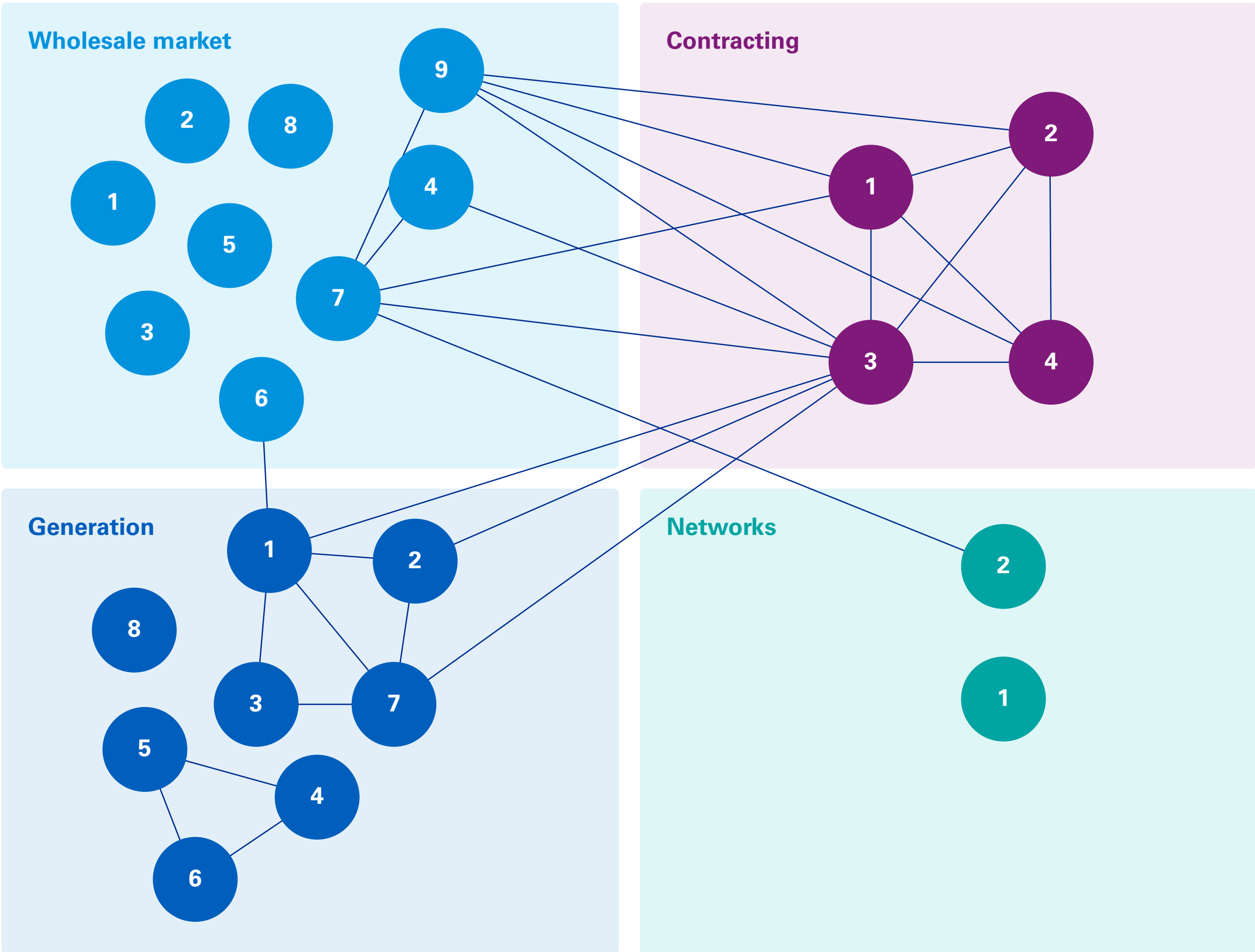
Changes to generator registration thresholds will have a broad impact that will require consideration of costs and benefits of reforms on newly obligated generators.

4.

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**



Wholesale market

1. Application of the Regional Reference Node Test to the Reliability and Emergency Reserve Trader
2. Threshold for participant compensation following market intervention
3. Intervention compensation and settlement processes
4. Enhancement to the Reliability and Emergency Reserve Trader
5. Participant compensation following market suspension
6. Transmission loss factors
7. Wholesale demand response mechanism
8. Global settlement and market reconciliation
9. Five minute settlement

Contracting

1. Short term forward market
2. Market making arrangements in the NEM
3. Retailer Reliability Obligation
4. Voluntary market making

Generation

1. Transparency of new projects
2. Generator three year notice of closure
3. Generator registration thresholds
4. Primary frequency response requirement
5. Removal of disincentives to primary frequency response
6. Monitoring and reporting on frequency control frameworks
7. Improving transparency and extending duration of MT PASA
8. System restart services, standards and testing

Networks

1. Maximum reactive current during a fault
2. Demand management incentive scheme and innovation allowance for TNSPs

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 of the report:

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 COGATI and NEM2025

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 of this report 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. 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.

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

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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