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# REVIEW

**Australian Energy Market Commission**

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## **DISCUSSION PAPER**

### **Strategic Priorities for Energy Market Development**

10 September 2015

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## **About the AEMC**

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

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# 1 Introduction

Every two years, the AEMC considers the strategic priorities for Australia's electricity and natural gas markets. We are currently conducting our third strategic priorities review to determine how the existing priorities may need to evolve given advances in the COAG Energy Council's policy priorities as well as changes both within the energy markets but also in a range of external factors that influence the way those markets operate.

## 1.1 Purpose of the Strategic Priorities

The purpose of the strategic priorities is to frame key issues for consideration and dialogue amongst consumer groups, market participants and policy makers. To the extent that the AEMC has a degree of discretion over its work program, the priorities also assist with the prioritisation of resources and the development of new work streams, as well as directing stakeholder engagement priorities.

This year we have also had early engagement with the COAG Energy Council's Senior Committee of Officials (SCO), a range of consumer groups, industry participants, the Australian Energy Regulator (AER) and Australian Energy Market Operator (AEMO). A focussed set of market priorities that the COAG Energy Council and the AEMC could work on delivering in unison could potentially deliver future required reforms more quickly, without jeopardising current analytical and consultation standards.

All of the AEMC's work, including the development of these strategic priorities, is guided by the national electricity objective, the national gas objective, and the national energy retail objective. Each objective incorporates the achievement of economic efficiency in the long-term interests of consumers as the basis for the advice we provide to the COAG Energy Council (the Energy Council) and when we make decisions about rule change requests.

## 1.2 Current Strategic Priorities

Our current strategic priorities for energy market development were established in 2013 and developed in consultation with consumer groups, government and the energy industry. At the completion of the review in October 2013, we confirmed that our strategic priorities for energy market development were:<sup>1</sup>

- **Consumer priority:** Strengthening consumer participation and continuing to promote competitive retail markets.
- **Gas priority:** Promoting the development of efficient gas markets.
- **Market priority:** Market arrangements that encourage efficient investment and flexibility.

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<sup>1</sup> See: AEMC, Strategic Priorities for Energy Market Development, 2013.

These priorities are referred to as our "existing priorities" throughout this paper, and have helped guide the AEMC in the development of our 2014 and 2015 work program.

### **1.3 2015 Strategic Priorities**

As noted above, we seek to reconsider our strategic priorities every two years. This discussion paper provides the AEMC's preliminary views on priority areas for energy market development. This material will form the basis of a public forum where they will be tested with stakeholders to gain alignment on the priority areas.

We believe that the current priorities broadly have the right focus, particularly in relation to the consumer and gas priorities but would like to test this during the consultation process.

In chapters 3 to 5 of this paper, we set out why we consider each priority to still be relevant for the energy market. We then outline the areas that we consider should be a focus for each priority over the next two to three years.

### **1.4 Consultation**

We will hold a public forum on 30 September 2015 to receive feedback on the strategic priorities proposed in this discussion paper in Sydney. To register your interest in attending this forum, please use the form available on the AEMC website.<sup>2</sup>

We welcome written comments on this discussion paper, which are due **by no later than 5pm, Friday 9 October 2014**.

Submissions should refer to the AEMC project number "EMO0030" and be sent electronically through the AEMC's online lodgement facility at [www.aemc.gov.au](http://www.aemc.gov.au).

All submissions received during the course of this review will be published on the AEMC's website, subject to any claims for confidentiality.

In the submissions, the Commission would be particularly interested in views on the following:

- whether the priorities are appropriate or not, and, how the priorities should evolve;
- the areas of focus that the Commission has articulated for each of the priorities;
- whether some areas of focus are more important than other areas of focus;
- whether some areas of focus should not be a priority; and
- how the AEMC, governments and industry can help to address the issues identified in this paper.

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<sup>2</sup> See: <http://www.aemc.gov.au/Calendar/Public-forum-on-Strategic-Priorities-for-Energy-Ma>.

## **1.5 Structure of the discussion paper**

The remainder of this discussion paper comprises four sections:

- chapter 2 discusses the external context for the strategic priorities;
- chapter 3 discusses the consumer strategic priority;
- chapter 4 discusses the gas priority; and
- chapter 5 discusses the markets priority.

## 2 Context for the strategic priorities

Our strategic priorities relate to *energy* market development. The AEMC's role is to promote efficient, reliable and secure market frameworks for energy services, which serve the long-term interests of consumers.

However, energy prices and other outcomes that consumers see result not only from the rules applied to the energy sector, but also from external influences and policies that impact the energy sector. This chapter explores several key external areas that impact on the outcomes observed in the energy sector. These serve as important context for the development of the AEMC's strategic priorities.

### 2.1 Governance of the energy sector

Currently, an expert panel is reviewing the national energy market governance arrangements to assess the effectiveness of the governance models and whether they remain fit for purpose.<sup>3</sup> A draft report for this review was recently published for public consultation, with the final report due to be submitted to the Energy Council in September 2015.

Separating the roles of government, rule maker and market developer, regulator and market operator has resulted in independent decision makers with clear accountabilities and objectives. We understand that investors generally appreciate the value of these separate roles in promoting a transparent and predictable regulatory regime.

In coming years, as the priorities in this document reflect, energy markets in Australia will come under pressure from an increasingly diverse array of internal and external influences. The Energy Council and its institutions will need to focus on even greater collaboration and effective working arrangements to ensure that Australia's energy markets can evolve to meet these new challenges.

### 2.2 Environmental and social policies

Addressing environmental and social issues requires value judgements using a wide range of information about the economy as a whole, and about the welfare of the population. These issues clearly rest with governments given their broad impact.

Environmental and social policies can, however, directly influence outcomes in energy markets, including movements in wholesale and retail prices. They can also result in changes to investment incentives and risk allocation, as well as the level of consumer engagement with the market.

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<sup>3</sup> See: <http://www.scer.gov.au/workstreams/energy-market-reform/review-of-governance-arrangements/>.

## Environmental policies

While energy market and environmental policies have different objectives, they can be designed in such a way to ensure that the objectives of both are met, while the costs faced by consumers are minimised. An environmental policy that continues to meet its objective in the face of changing economic conditions, and minimises distortions on energy markets, will also have a better chance of being in place for the long term.

For energy and environmental policies to be mutually reinforcing, it is important that they are designed and implemented with regard to one another. Environmental policies can create distortions in energy markets that end up changing the risk allocation in those markets. Well-designed markets help to ensure that the risks associated with market investment are borne by businesses that make the investment decisions. When a policy external to the energy sector places investment risk onto consumers, this reduces the incentives for businesses to manage this prudently and exposes consumers to the costs of inefficient investment.

While policies like the Renewable Energy Target (RET) are within the government's potential environmental policy toolkit, the integration of that policy with the NEM was potentially not well understood. The RET set a fixed target for growth in renewable generation without regard to supply and demand conditions and wholesale prices in the market. Risks around whether the new investment would be profitable or efficient were effectively transferred to consumers through higher retail prices, as well as the equity owners of existing generators in the form of lower wholesale prices. Unlike the new capacity supported by the RET, existing generators are not shielded from lower wholesale prices through certificate payments funded by consumers.

Mechanisms to meet environmental objectives should be sufficiently flexible such that the way risks are allocated, as well as the effect on energy markets and overall efficiency of the scheme is not predicated on one particular view of market conditions into the future. Energy and environmental policies that are developed with regard to one another and that preserve the efficacy of the price discovery and risk allocation mechanisms in energy markets will result in the respective policy objectives being met and the costs faced by consumers minimised.

Setting environmental objectives is unambiguously the role of governments. The AEMC's interest is in the mechanism for achieving the objective and ensuring this is done in a way that supports energy market efficiency and the long term interests of consumers. In this respect, we consider mechanisms to achieve environmental objectives should:

- have the ability to meet the objectives whatever the future may bring in terms of demand growth, relative input prices and technological changes; and
- be compatible with the pricing mechanisms used to trade electricity and consistent with the allocation of risk between generation businesses and consumers that underpins the efficient operation of energy markets.

Energy policy and environmental policy can co-exist but consumers' interests will be better served if they are explicitly developed in a complementary and mutually reinforcing way.

### **Concession policies**

Similar to environmental policy, policies which provide support to specific groups of consumers also influence outcomes in the energy sector. We have observed that concession policies and mechanisms vary from jurisdiction to jurisdiction, increasing the compliance burden for retailers required to administer these programs across multiple jurisdictions. Often it is the smaller retailers without sophisticated systems and large compliance teams who are most affected, restricting their ability to compete. Greater consistency in the mechanism for delivering concessions (as distinct from the level of concessions) across jurisdictions would reduce this burden.

Affordability is still a key issue for consumers, industry and governments. While the AEMC's work on price trends indicates that price growth may be moderating in coming years, the affordability of energy will continue to be an important issue, particularly for vulnerable consumers. The effectiveness of concessions and hardship policies is one of the key issues for consumer groups and may become an increasingly important issue as concerns about vulnerable groups "being left behind" as the level of technological innovation in the market increases.

### **Integrated policies**

Energy, environmental and social policies all have different objectives. Therefore, in order to deliver good outcomes for consumers, it is important that they are developed in a congruent manner. Policies that are mutually reinforcing and internally consistent will have a greater likelihood of minimising the costs faced by consumers in energy markets, maintaining appropriate price signals for energy market participants and promoting reliability of supply. Integrated policy outcomes are more likely to occur when decisions are taken in a transparent manner and after full consultation with all interested parties.

A greater focus on policy integration will become increasingly important as new market participants, possibly regulated through other sectors of the economy, or from different international markets, enter the energy space. Understanding the impact that decisions in other portfolios will have in the energy sector and proactively engaging on those issues will help progress the Energy Council's reform agenda more effectively.

## **2.3 Public perceptions about market frameworks**

Aspects of the energy market framework in Australia have received a lot of attention in recent years, particularly the impact of retail competition and the regulation of network businesses.

The effective operation of the energy sector in Australia depends on a number of elements including the rules that govern how energy businesses and consumers

participate in the sector, the application of those rules by the regulator and the corporate governance arrangements for those businesses. While the AEMC makes rules which govern the energy market, we cannot initiate rule changes. This is an important part of the market governance arrangements and underpins our independence. Rules are changed in response to requests brought to us by individuals, community groups, government and industry.

It is important that there is an understanding of the market framework in the public domain. Issues around network regulation, including the outcomes of regulation for consumers, and whether consumers face effective choice in retail markets, should be discussed based on this context. It is also important that there is alignment on these key areas of the market framework and the benefits that the reform program is delivering to consumers, and that these are effectively communicated.

## **2.4 Gas supply side issues**

Upstream policies that impact on the supply of gas, including exploration and drilling moratoriums, are outside of the AEMC's remit, but influence market outcomes and provide important context for gas market development.<sup>4</sup> Improving efficiency in the way that gas flows to those users who value it the most will have a limited effect on market outcomes if the supply side is not largely in balance with the demand side. When supply side imbalances persist, periods of high prices and consequent reductions in demand can be expected.

In this context, we welcome the Energy Council's broader Gas Market Development Plan<sup>5</sup> as well as various other initiatives that will generally complement the work the AEMC is undertaking in this area.

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<sup>4</sup> EnergyQuest, EnergyQuarterly August 2015 Report, p. 23.

<sup>5</sup> See: <http://www.scer.gov.au/workstreams/energy-market-reform/gas-market-development/>.

### 3 Consumer priority

The AEMC adopted *strengthening consumer participation and continuing to promote competitive retail markets* as one of its three strategic priorities for energy market development in 2013. This priority aimed to further enable consumers to participate confidently in all parts of the energy supply chain – the retail, generation and network sectors. At the time, much of the AEMC work program was focussed around work that would substantially progress this priority.

Empowered consumers can benefit from, and contribute to, the effective functioning of the energy sector. Therefore, this priority remains one of the strategic priorities for the 2015 review. A shift to greater consumer participation will put consumer decision-making more at the centre of the industry.

#### 3.1 Why are consumers still a priority?

The AEMC has undertaken extensive work aimed at improving consumer participation (both participation directly in retail markets, but also with regulatory processes) over the last two years; however, this remains an essential area of work to deliver long-term benefits for consumers.

It is important that energy markets service consumer needs. For this to happen, consumers must be able to make their needs heard, and also be well equipped to make decisions about energy use.

Effective consumer participation can contribute to more efficient markets and help consumers manage how much they spend on energy. Competitive retail markets promote choice and value for consumers, by providing incentives for retailers to minimise costs and prices, and to offer a range of products.

Consumer participation in the energy sector takes a number of forms, including:

- shopping around for energy plans;
- installing distributed generation;
- managing energy use, such as with supporting equipment, technology, third-party options or reducing consumption; and
- engaging with policy, regulatory and market processes.

Consumers' choices can drive more efficient outcomes when the prices they pay for energy reflects the costs of supplying them, and the supply chain is flexible enough to respond to their choices. Transmission and distribution network assets are built to provide a reliable supply to all consumers in accordance with jurisdictional reliability standards, with these standards typically based on meeting peak demand. The assets built to meet peak demand tend to have low utilisation rates because they are only fully utilised a few times every year on the hottest days and coldest nights. Signalling the real cost of consumption at peak times to consumers can encourage other ways of

meeting demand, such as demand-side response,<sup>6</sup> conserving energy and energy efficiency measures. Demand-side options can help reduce the need for additional network infrastructure.

Consumers' choices of energy products and services can drive improvements in capital utilisation and productivity. For this to occur, service providers need to compete to offer not just energy, but the best combination of demand and supply-side options to meet consumers' needs. Further, consumers need to be as comfortable shopping for energy as they are for other services where choice and competition are the norm.

### **3.2 How have the 2013 priority areas evolved?**

In 2013 our consumer priority was focussed on strengthening consumer participation in all parts of the energy supply chain: both participation directly in the market as customers; and participation in policy development and regulatory processes. We identified that increasing innovation in technology and service offerings to consumers would provide enhanced opportunities for participation and choice. Consumers would need access to effective information and tools to support decision making in such an environment.

Below we set out how the five consumer priority areas identified in 2013 have evolved.

#### *Competitive retail markets*

A key issue in 2013 was to continue to develop competitive retail energy markets with strong consumer protections as a basis for innovation, consumer choice and competitive pricing. Such retail energy markets can lead to greater consumer participation, which in turn feeds competition, ultimately to the benefit of all consumers.

Since that time, retail energy markets have continued to develop and the range of products, services and interactions between consumers and the market has diversified significantly, particularly in those retail markets where competition is more established and effective.

Since 2013, more jurisdictions have deregulated retail energy prices. For example, the NSW Government removed price regulation from 1 July 2014. These decisions were informed by AEMC reviews that found competition was effective in these areas.

Further, the Queensland Government has announced that the Queensland Productivity Commission will undertake a review into electricity prices in the state. A decision about retail electricity price deregulation will be made at the end of this review.<sup>7</sup>

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<sup>6</sup> Where big and small consumers agree to shift their electricity use to another time, or use a different source of generation or simply not to use electricity at peak times.

<sup>7</sup> See:  
<http://statements.qld.gov.au/Statement/2015/4/28/deregulation-deferred-as-productivity-commission-conducts-power-price-probe>; and  
<http://www.qpc.qld.gov.au/inquiries/public-inquiry-into-electricity-pricing/>.

In 2015, the AEMC's second NEM-wide review of retail competition found that the state of competition varies across the NEM, reflecting the different pace and stage of market reform across jurisdictions. Retail competition in electricity has led to a greater choice of retailer and price plans in Victoria, South Australia, NSW, South East Queensland and the ACT.<sup>8</sup>

Consumer research for the 2015 review found that most consumers are satisfied with their current retailer experience; however, the quality of interaction with customers is important and may vary between retailers. Many customers are shopping around to save money. The research also showed that consumers want choices, but they find it difficult to compare energy deals. Consumers are seeking more transparent and meaningful information from retailers and governments to help them shop around with confidence. Very few customers surveyed were aware of the government-run websites available to make comparisons easier - including *Energy Made Easy*, *Your Choice* and *My PowerPlanner*.

#### *National Energy Customer Framework*

The National Energy Customer Framework (NECF) is the national customer protection framework for the retail sale of electricity and gas to residential and small business energy customers. The stated aim of the associated laws and rules is national consistency in the medium to long term for all stakeholders in the energy market.

The NECF has now been adopted in all jurisdictions aside from Victoria; however, there are a number of jurisdictional differences in how the framework has been applied. These modifications have effectively resulted in there being different versions of the NECF that apply in each jurisdiction, as well as adding costs to retailers of having to comply with the different frameworks. Victoria has deferred its transition to the NECF in order to put in place arrangements so that there is no reduction in key protections for Victorian consumers.<sup>9</sup>

The effect of this has made it more complex for consumers to understand how the NECF applies to them. There are also now concerns that the NECF may not be fit-for-purpose in the changing world of new products and services. For instance, not all new entrants to the energy sector are brought within the existing obligations.

In December 2014, the COAG Energy Council committed to "undertake an assessment of the differences in how jurisdictions have applied the [NECF] and examine whether there is a need to enhance frameworks in light of the ongoing change taking place in competitive energy markets, particularly as it regards the introduction of new technologies, products and services".<sup>10</sup> Officials are expected to report back on the outcomes of this at the December 2015 Energy Council meeting.<sup>11</sup>

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<sup>8</sup> See: AEMC, 2015 Retail Competitive Review, Final Report, 30 June 2015.

<sup>9</sup> See: <http://www.esc.vic.gov.au/Energy/Harmonisation-of-Energy-Retail-Codes-and-Guideline>.

<sup>10</sup> COAG Energy Council Communique, 11 December 2014.

<sup>11</sup> COAG Energy Council Communique, 23 July 2015.

## *Demand side participation and flexible pricing*

For consumers to manage their energy consumption and make informed decisions about electricity services they value, they need to be able to access the information that allows them to assess costs and benefits.

The AEMC's Power of Choice review, which concluded in November 2012, recommended a package of changes to provide households, businesses and industry with more opportunities to make informed choices about the way they use electricity and manage expenditure.<sup>12</sup> This review provided the Energy Council with an implementation plan to gradually phase in efficient and flexible pricing options.

Since 2013, a number of rule changes stemming from the Power of Choice review have been implemented or are currently underway. These include changes to the principles for distribution pricing,<sup>13</sup> new metering frameworks,<sup>14</sup> arrangements to allow multiple trading relationships at a customer's residence,<sup>15</sup> measures to address access to consumers' data,<sup>16</sup> improvements in demand side participation information provided to AEMO,<sup>17</sup> and demand management incentives.<sup>18</sup> In combination, these reforms are intended to give consumers greater information and an improved ability to manage their energy usage. They should also improve flexibility in the supply chain to enable businesses to be better able to respond to consumers' choice.

Our customer switching review also made several recommendations to the COAG Energy Council on how the consumer transfer process can be made more timely and accurate.<sup>19</sup> Having more timely and accurate transfers is likely to facilitate more positive customer experiences in the retail energy market, meaning that customers are more likely to continue to engage with the retail energy market in the long term.

Together these reforms will put consumers in the best position to decide what works for them in terms of electricity supply services, and so can signal their preferences.

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<sup>12</sup> See: AEMC, Power of choice review - giving consumers options in the way they use electricity, Final Report, 30 November 2012.

<sup>13</sup> See: AEMC, Distribution Network Pricing Arrangements, Rule Determination, 27 November 2014.

<sup>14</sup> See:  
<http://www.aemc.gov.au/Rule-Changes/Expanding-competition-in-metering-and-related-serv>.

<sup>15</sup> See: <http://www.aemc.gov.au/Rule-Changes/Multiple-Trading-Relationships>.

<sup>16</sup> See: AEMC, Customer access to information about their energy consumption, Rule Determination, 6 November 2014.

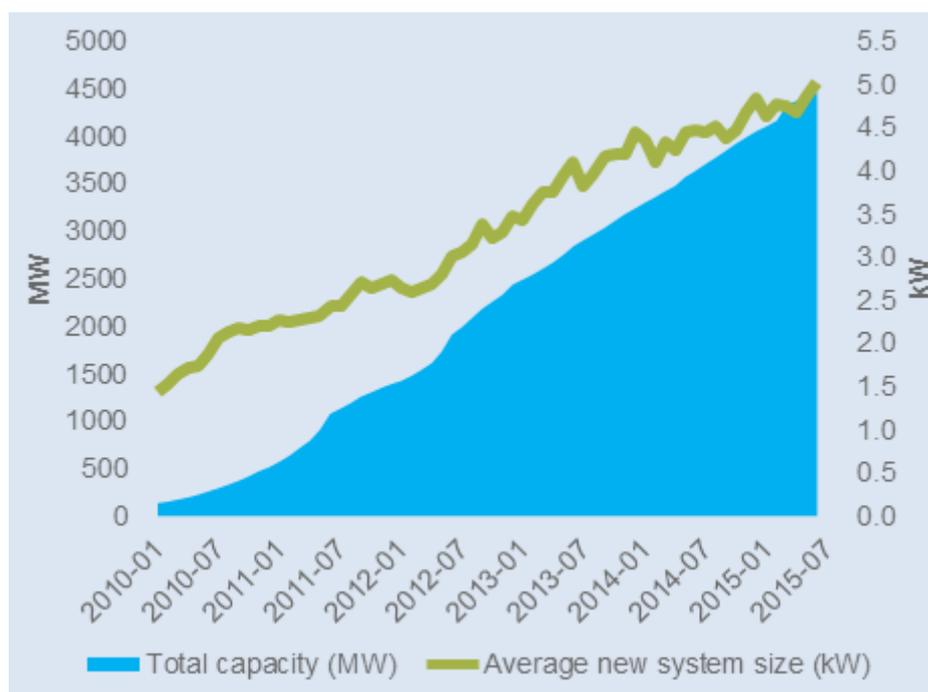
<sup>17</sup> See:  
<http://www.aemc.gov.au/Rule-Changes/Improving-Demand-Side-Participation-information-pr>.

<sup>18</sup> See:  
<http://www.aemc.gov.au/Rule-Changes/Demand-Management-Embedded-Generation-Connecti-on-I>.

<sup>19</sup> See: AEMC, Review of Electricity Customer Switching, Final Report, 10 April 2014.

Changes in technology have been a key driver of changing electricity consumption patterns. There has been a significant penetration of air-conditioning across the NEM that has driven large increases in peak demand. More recently, the market has seen the rising uptake of solar PV panels by residential consumers (Figure 3.1). The uptake of solar PV has contributed to falling energy consumption from the residential sector, but has not had as significant impact on peak demand, resulting in a much larger gap between average and peak demand.

**Figure 3.1 Domestic solar PV is growing strongly**



Source: Clean Energy Regulator, Australian PV Institute.

Energy efficiency awareness and standards have also been contributing to decreases in overall energy consumption.

The Power of Choice review noted that most consumers (with or without distributed generation) were not paying prices that reflect the underlying costs and benefits of supply. This was due to current network tariffs and retail offers and the limited availability of real-time metering data.

The AEMC has made a rule that establishes a new pricing objective and new pricing principles for distribution businesses that will require that network prices reflect the efficient costs of providing network services.<sup>20</sup> Network prices based on the new pricing objective and pricing principles will be gradually phased in from 2017. This rule will go some way to removing cross-subsidies between different network users, including those with and without solar PV. However, there is little that can (or should)

<sup>20</sup> See: AEMC, Distribution Network Pricing Arrangements, Rule Determination, 27 November 2014.

be done about the sunk investments made by consumers on the basis of previous feed in tariffs and distribution price signals.

#### *Enhancing consumer representation in policy and regulatory processes*

Enabling consumers to participate in energy markets also involves their representation in policy and regulatory processes.

The AEMC has been active in seeking to engage with consumer representative groups. Since 2013, we have held a number of Consumer Priorities Forums to understand key issues for consumer representative groups which have helped our understanding of consumer's experiences in energy markets. We have received positive feedback on this from consumer representatives.

The AEMC participates in the AER's Customer Consultative Group and is a regular invitee to the National Consumer Roundtable on Energy. Further, a number of opportunities for consumer participation in policy and regulatory processes, which were identified in 2013, have now been implemented:

- On 1 July 2013, the AER had established the Consumer Challenge Panel to help incorporate the interests of consumers into decisions on network costs.
- On 30 January 2015, Energy Consumers Australia (ECA) assumed the consumer advocacy grant functions of the Consumer Advocacy Panel (CAP) and CAP ceased operations. The ECA focuses on national energy market matters of strategic importance for energy consumers.
- The AEMC's Review of Frameworks for Transmission and Distribution Reliability examined ways to better reflect the value consumers place on reliability in planning transmission and distribution investment.<sup>21</sup> The recommended framework would promote greater efficiency, transparency, and community consultation in how reliability levels are set and provided across the NEM. In December 2014 the COAG Energy Council agreed that a set of high level principles to guide a high level national approach to reliability will be implemented on a jurisdictional basis.<sup>22</sup>

### **3.3 What are the areas of focus for the 2015 priority?**

The AEMC proposes that the consumer priority remains in place: Strengthening consumer participation and continuing to promote competitive retail markets.

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<sup>21</sup> See: AEMC, Review of the national framework for transmission reliability, Final Report, 1 November 2013; AEMC, Review of the national framework for distribution reliability, Final Report, 27 September 2013.

<sup>22</sup> See:  
<https://scer.govspace.gov.au/files/2014/12/Response-to-AEMCs-review-of-National-Reliability-Framework.pdf>.

We propose that this priority should have the following three areas of focus:

1. **Engagement:** Do consumers have enough useful information to shop around? How do consumers, with divergent interests, engage with the regulatory process?
2. **Participation:** Do the prices consumers pay for energy reflect the costs of supplying them? Do consumers have the ability to respond to these price signals, particularly through access to new technologies? Is supply responsive to changing consumer preferences and choices?
3. **Protection:** What consumer protections are required in response to technology and new business models? How should the NECF evolve?

### Engagement

Effective consumer engagement remains a priority area for development in a changing market in order to ensure the long-term interests of consumers.

Engagement is not necessarily about consumers switching retailers, but rather *awareness*, so that consumers can be engaged if they wish to be. Consumer choices about how to participate in the retail energy market are influenced by a number of different factors, including the level and type of tariff, the means and timing of paying their bills, quality of supply, marketing activities by a company, trust or otherwise, and familiarity and past history. Consumers that do not switch retailers may still be engaged in the energy market, but value loyalty and trust above a discounted price.

Indeed, consumers' experiences in retail energy markets have wider impacts. While a relatively small proportion of consumers may have bad experiences, the impact felt by these consumers can be substantial. It only takes unsatisfactory experiences for a few customers to be known more widely to undermine confidence in electricity markets, and processes more broadly.

New challenges arise as the diversity of products and services available to consumers increase. This diversity will further increase with new and emerging technologies. Given this, governments and market bodies have a role in ensuring that consumers have an appropriate level of information about such products and services.

We consider that more work is needed in terms of raising awareness about how to meaningfully compare energy offers, and understanding that consumers can choose to "switch and save" if they want to. How consumers respond to this information is up to them, but the information available needs to be *meaningful*. We understand that much of what consumers *want* in terms of information exists, such as independent government comparison websites, but that the information may not always be presented in an easy to understand way.

A key question is *who* is best placed to communicate such information to consumers. A public information campaign could inform consumers of their choices on energy plans.

However, it is important that the information being provided is from an independent source, such as governments, to ensure the legitimacy of the information.

Finally, it is also important to ensure that consumers are represented in regulatory processes that affect network businesses. The explicit and transparent consideration of consumer preferences in regulation of network businesses should result in more responsive networks and better services for consumers. Different groups of consumers have different interests, eg, some focus on disadvantaged consumers, while others focus on small businesses. It is important for all types of consumers to be represented in the regulatory process, and more work could be done in this regard. For instance, if these preferences were explicitly considered in setting reliability standards, consumers would experience better outcomes in energy markets, since reliability would reflect what consumers' value.

### **Participation**

Consumers also have different needs in terms of retail markets - some will focus on accessing the latest technology and services, while others focus on obtaining the lowest possible price for their energy supply. The challenge will be to have a competitive market that allows consumers to find the best products and services *for them*, while providing assistance for vulnerable consumers to participate.

Another key question is whether the prices that consumers pay for energy reflect the cost of supplying them. The recent rule changes made by the AEMC in relation to distribution pricing should help in this regard,<sup>23</sup> with these prices coming into effect for consumers in 2017. However, having these prices alone is not sufficient. It will be important that consumers have the ability, and the right information, in order to respond to these price signals. Complementary programs and measures need to be in place to support the reforms.

It is also important that energy suppliers respond to changing consumer preferences and choices. Here, any technology changes will play an important role since it will shape the way consumers use electricity. New and emerging technologies like battery storage and electric vehicles have the potential to significantly change how consumers use energy in the coming years. For instance, the demand-side response mechanism rule change looks for a way of integrating consumer preferences with the wholesale market.<sup>24</sup>

### **Protection**

Technology changes will, and have, resulted in new and changed business models for electricity suppliers. Technology and new business models are discussed further in chapter 5 of this paper. In response to these changes, energy-specific consumer protections (ie, the NECF) require rethinking.<sup>25</sup> The consumer protections should be

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<sup>23</sup> Discussed above in section 3.2.

<sup>24</sup> See: <http://www.aemc.gov.au/Rule-Changes/Demand-Response-Mechanism>.

<sup>25</sup> Rethinking energy-specific consumer protections also requires considering to what extent the Australian Consumer Law covers such new products and services.

flexible enough to adapt to changing business models, but still protect consumers in the face of these developments.

We consider that the current arrangements lack the flexibility required to provide appropriate consumer protections for evolving relationships between consumers and energy service providers. There will need to be a clear balance sought between ensuring positive consumer outcomes from new business models and technological change, with the desire to encourage innovation and a range of new products and services.

Any analysis on the need to change energy-specific consumer protections will also likely require a fundamental rethink of the approach to energy regulation and its essential service characteristics. It also needs to occur as a matter of priority to prevent detrimental consumer outcomes that may undermine confidence in the market.

## 4 Gas priority

The AEMC adopted *promoting the development of efficient gas markets* as one of its three strategic priorities for energy market development in 2013. The gas priority recognised that a reliable, competitive and secure gas market allows efficient and timely investment in gas infrastructure, in the long term interests of consumers.

At the time, there was considerable uncertainty around how the east coast market would adjust to the establishment of a liquefied natural gas (LNG) export industry, and whether the market and regulatory frameworks would continue to promote efficient use of, and investment in, natural gas services.

Gas market development and the efficiency of the gas supply chain continue to be a key area of focus for the Energy Council, consumers of gas and industry participants. For this reason we are proposing that this priority continues to form part of the 2015 priorities. With a better understanding of how the market dynamics are changing since 2013, we are proposing to re-focus the gas priority on key issues and challenges identified by stakeholders.

While natural gas is growing in importance to the Australian economy, some domestic gas users are reportedly facing difficulties negotiating new gas contracts. This highlights the importance of developing a liquid wholesale gas market on the east coast that provides participants with greater flexibility outside of long term contracts when buying and selling gas.

Finally, we recognise that work undertaken by the Commission will not address upstream supply-side issues currently facing the east coast gas market. This is because market and regulatory frameworks that allow gas to flow to those who value it the most focus on issues arising once gas enters the pipeline system. Nonetheless, we acknowledge the importance of gas markets and pipeline regulation to the efficiency of the entire gas supply chain, and as the market evolves it is important to consider whether these arrangements will continue to promote the National Gas Objective (NGO).<sup>26</sup>

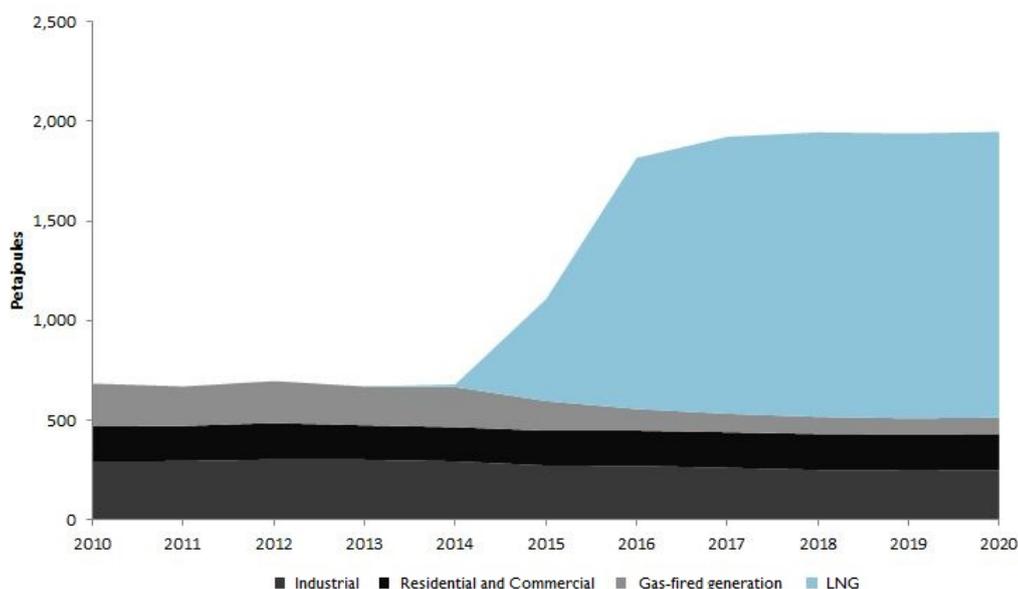
### 4.1 Why is gas still a priority?

In January 2015, first LNG cargos were exported from Gladstone, with large volumes of coal seam gas (CSG) coming online to meet the new demand from LNG. First exports represent a historic moment for the east coast gas industry and the market has now entered a transitional period to a new supply/demand balance. Demand for east coast gas will increase substantially as the three LNG export projects ramp up to full production, as can be seen in Figure 4.1.

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<sup>26</sup> The national gas objective is to promote the efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

**Figure 4.1 Demand for east coast gas - 2010 to 2020**



Source: AEMO Gas Statement of Opportunities 2014.

Natural gas is a prominent fuel source in the Australian economy, with 23 per cent of Australian energy consumption sourced from gas in 2012-13.<sup>27</sup> In the east coast domestic market, gas is primarily used for manufacturing (34 per cent) and electricity generation (33 per cent), with residential consumption (17 per cent) also material. Given the role gas plays in the Australian economy, promoting the development of efficient market and regulatory arrangements is likely to have positive benefits for the broader economy.<sup>28</sup>

Recognising the structural changes underway in the east coast market, and the importance of gas to the Australian economy, the Commonwealth and Victorian Governments undertook reviews of the gas sector in 2013.<sup>29</sup> Following these reviews, the COAG Energy Council has tasked the AEMC to consider the direction that gas market development on the east coast should take, given the new market dynamic presented by the LNG export industry. Alongside this review, the Victorian Government has also asked the AEMC to look in detail at the specific arrangements in Victoria.<sup>30</sup>

As noted above, the reviews being carried out by the AEMC are focussed on the efficiency of the supply chain once gas enters the transmission pipeline system. Upstream policies that impact on the supply of gas are outside of our remit, but important context for the Commission's work. We note that restrictions on gas supply

<sup>27</sup> BREE 2014, Australian Energy Statistics, Tables A, D.

<sup>28</sup> Australian Energy Statistics 2014, Table F.

<sup>29</sup> Victorian Government 2013, Gas Market Taskforce - Final Report and Recommendations, October 2013; Commonwealth Government 2014, Eastern Australian Domestic Gas Market Study, January 2014.

<sup>30</sup> For the terms of references see the AEMC website.

or inquiries into gas field development currently exist in New South Wales, Victoria, South Australia and Tasmania.<sup>31</sup>

## 4.2 How have the 2013 priority areas evolved?

The 2013 strategic priorities review recognised that the east coast gas market was entering a period of transition due to the establishment of an LNG export industry. Although exports had not yet commenced, it was clear that the domestic market was feeling the effects of greater competition for gas.

East coast wholesale gas prices, which had been historically low by international standards, were rising as new gas contracts were negotiated due to the tight supply and demand balance. This was primarily due to the supply-side uncertainty around whether sufficient CSG reserves could be developed in time to meet LNG export schedules.

In contrast to conventional gas fields where only a small number of wells are drilled, thousands of CSG wells are required to be drilled to supply the LNG plants, along with pipeline, processing and compression infrastructure. A drilling program on this scale is unprecedented in Australia and uncertainty exists around the ultimate productivity of the coal seams.

From a demand perspective, a new market dynamic facing domestic gas users is the competing LNG export industry. As the LNG proponents are also large domestic suppliers, their focus was, and continues to be, on developing sufficient reserves for export. At the time we identified that this was having two broad effects on the market:

1. a reluctance by gas producers to enter substantive, medium to long term gas contracts before commencing LNG projects; and
2. upward pressure on gas prices, due to the tight supply/demand balance.

Pipeline utilisation and flow direction were also identified as factors likely to be affected by the changing market dynamics. As production from the Cooper and Surat basins begins to be diverted to LNG facilities, it was expected that additional gas would be supplied from Victoria into the northern states. In this context, gas storage was also identified as being likely to play a more influential role in managing seasonal demand and supporting the coordination of CSG wells for the LNG plants.

Our findings from the 2013 strategic priorities review, and the Gas Market Scoping Study completed by the AEMC in 2013,<sup>32</sup> highlighted the need for a strategic plan to facilitate the development of the market through this transitional period.

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<sup>31</sup> EnergyQuest, EnergyQuarterly March 2015 Report, p. 20-21.

<sup>32</sup> K Lowe Consulting, Gas Market Scoping Study, a report for the AEMC, July 2013.

Since the 2013 strategic priorities review was completed, the following key events have occurred:

- the Gas Supply Hub at Wallumbilla commenced operation in March 2014; and
- first exports of LNG were shipped from Gladstone on 5 January 2015.

#### *Wallumbilla Gas Supply Hub*

In December 2012, the Council announced that a voluntary brokerage hub would be established at Wallumbilla in Queensland. The Council requested AEMO develop this hub to enhance transparency and reliability of gas supply by creating a market that offers a low-cost method to buy and sell gas at interconnecting transmission pipelines.

In March 2014, the Wallumbilla Gas Supply Hub commenced operations. The Wallumbilla hub has three physical trading locations and, while the three pipelines are connected, they operate under different pressures and contractual arrangements by two pipeline owners. As such, there is no single physical location that allows shippers to trade across the Wallumbilla hub.

Since market start to the end of July 2015 there has been 4.67 PJ of gas traded, which, at a volume weighted average price of \$3.08/GJ, equates to approximately \$14.41 million in trades.<sup>33</sup> Trading is relatively sporadic, with a number of extended periods of little or no trading activity at the hub. We note that APA Group and Jemena have developed electronic bulletin boards to assist shippers to trade pipeline capacity around Wallumbilla.<sup>34</sup>

AEMO has commenced a body of work to explore development opportunities at the Wallumbilla Gas Supply Hub and to potentially develop another trading location at Moomba. The Energy Council will consider AEMO's findings in December 2015.

#### *First exports of LNG from the east coast*

On 5 January 2015, QCLNG exported the first east coast cargo of LNG. As can be seen in Figure 4.2, the Brisbane STTM ex ante price decreased through 2014 until 27 December, when loading of the first LNG export cargo took place. The decrease in prices at the Brisbane STTM hub reflected a short term oversupply driven by the need to bring 2,000 CSG wells progressively online ahead of production commencing at the LNG plant.

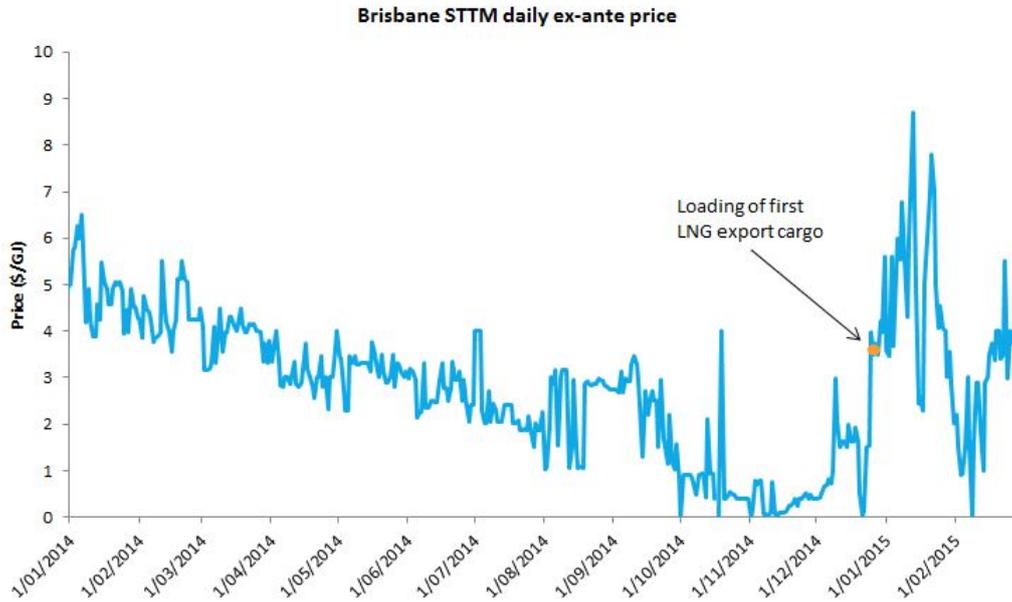
As the liquefaction of natural gas and loading of the first cargo took place, STTM prices increased and exhibited greater volatility as excess gas in the market was used by the LNG plant. Market conditions are expected to remain dynamic over the next 12 to 18 months as a further five LNG trains are brought online and ramped up to full production over the next two years.

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<sup>33</sup> 4.67 PJ is equivalent to around 1.8% of total consumption in Queensland in 2014.

<sup>34</sup> See: <http://www.gasbb.com.au/Transmission%20Capacity%20Listing.aspx>

**Figure 4.2 Brisbane ex ante STTM prices have been volatile as first LNG cargos were shipped**



Source: AEMC analysis; AEMO.

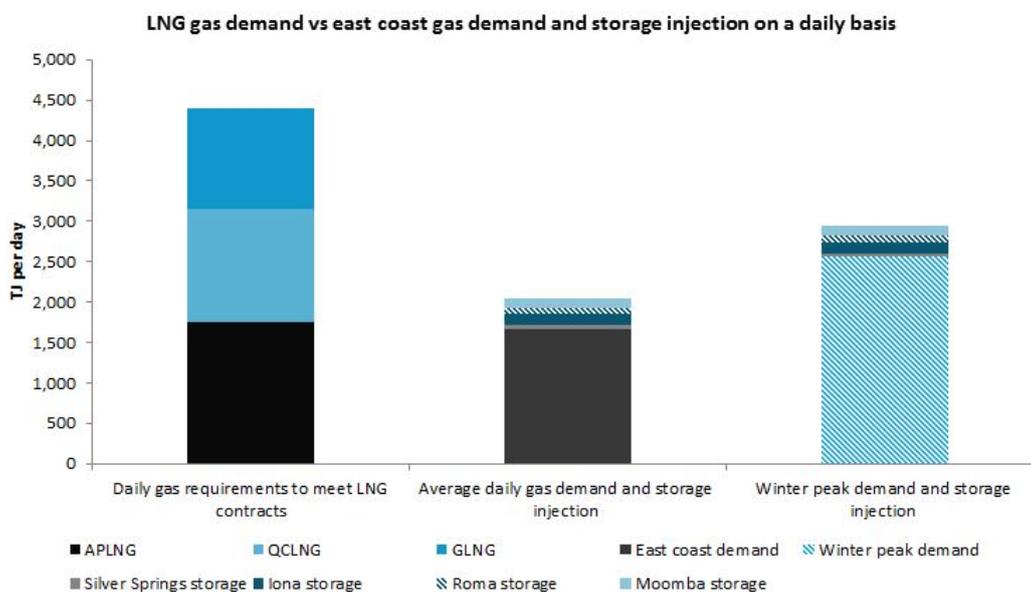
Once the LNG plants are fully operational they will consume around 4,400 TJ of natural gas per day on average to meet their contractual obligations, and more if the trains are run at maximum capacity. This compares to average daily consumption on the east coast of 1,665 TJ per day and winter peak demand of 2,560 TJ per day, as shown in Figure 4.3.<sup>35</sup>

As can be seen in Figure 4.3, the gas required for LNG production is over double domestic consumption and potential storage injection on a daily basis. If an average turn down rate of 80 per cent for CSG wells is assumed, and one of the LNG trains trips unexpectedly, this leaves 125 to 174 TJ/day of gas to be absorbed by the domestic market - equivalent to 6 to 8.5 per cent of average daily gas demand and storage injection.

The large amount of gas required for LNG exports compared to domestic consumption, combined with the inherent variability in supply from CSG, may stimulate the need for greater flexibility by participants to optimise their gas portfolios.

<sup>35</sup> EnergyQuest, EnergyQuarterly March 2015 Report, p. 69-75; AER Industry Statistics.

**Figure 4.3 Daily gas demand from LNG is over double domestic market demand**



Source: AEMC analysis; EnergyQuest; AGL; AEMO; Santos; AER.

A number of scenarios can be envisaged where the supply/demand balance on the east coast could shift quickly in response to LNG export operations, including:

- during commissioning of the LNG trains;
- when the LNG trains start up and shut down for maintenance;
- if an LNG train trips unexpectedly;
- if the capacity of the LNG export pipeline is reduced for unplanned maintenance; and/or
- if the productive capacity of the gas fields is reduced for unplanned maintenance.

Under these scenarios, having the flexibility to trade gas and pipeline capacity at short notice, and access gas storage, may provide greater scope for managing the security and reliability of the gas system, as well as maximising efficiency in the allocation of gas across the broader market.

### 4.3 What are the areas of focus for the 2015 priority?

The gas priority in 2015 will complement the east coast gas review and the Victorian-specific gas review. On this basis, we propose the following three areas of focus which reflect our broad interpretation of the Council’s vision for Australian gas markets:<sup>36</sup>

<sup>36</sup> COAG Energy Council Australian Gas Market Vision, December 2014.

- **Wholesale gas trading markets:** How should the gas trading markets be structured to maximise efficiency of trade and minimise transaction costs?
- **Pipeline capacity trading:** How should the transmission pipeline framework promote efficient investment and allocation of capacity, while supporting trade in wholesale gas markets?
- **Information:** What information does a liquid wholesale gas market require to function effectively?

The gas reviews are being conducted over two stages. Stage 1 of the review is now complete with the stage 1 final report provided to Ministers at the Energy Council's July 2015 meeting, and published on our website. The Stage 1 report provided an overview of how Australia's gas markets function and outlined areas where reforms may be required to accommodate the changing dynamics created by LNG exports and coal seam gas production. The report also recommended four immediate actions to enhance the transparency and efficiency of the market. At the July 2015 meeting, the Energy Council agreed to the four actions that were recommended:

- improve price transparency through an ABS gas price index;
- identify additional information gaps that can be addressed to enhance pipeline capacity trading;
- submit a rule change request to harmonise the start time of the "gas day"; and
- remove the limitation in the National Gas Law (NGL) on who can submit Victorian Declared Wholesale Gas Market rule changes.

Stage 2 of the east coast gas review will develop more options to promote long-term gas market development and enable the rules governing the markets and pipelines to be fit for purpose in the new gas environment. While the review does not specifically review retail gas markets, the analysis and subsequent wholesale market design recommendations are expected to lower transaction costs associated with buying and selling gas, which would be reflected in retail prices. Key work that will be undertaken as part of Stage 2 includes:

- reviewing the efficiency of the wholesale gas markets - the Commission will consider the role and functions of the wholesale markets on the east coast, in light of their development and recent performance;
- maximising pipeline trading capacity - the Commission will further investigate the effectiveness of the frameworks and consider ways to facilitate secondary capacity trading. This more detailed work will also assess whether the existing third party access regime is likely to remain fit for purpose; and
- establishing a one-stop shop for gas market data - the Commission will consider the strategic direction for information provision to support a liquid wholesale gas market.

In relation to the Victorian-specific gas review, the first stages of this work were undertaken as part of Stage 1 of the east coast gas review. The Victorian review will continue throughout 2015 as a stand-alone review and will consider whether objectives for the Victorian market should change in light of the broader east coast environment, and whether the current market design is achieving its objectives. It will also consider the Victorian market's potential role in providing an efficient reference price for all east coast gas markets, and the capacity for inter-regional trade.

The AEMC will submit the east coast Stage 2 draft report, and the Victorian review draft report, to the Energy Council ahead of its December 2015 meeting.

We expect the priorities for gas set out in the final strategic priorities report will broadly reflect and complement the AEMC's findings and recommendations in these gas review reports.

### **Gas-fired generation**

The need for greater integration between the NEM and wholesale gas markets is a question generally raised through these types of reviews. Integration is interpreted as the need for systems that allow trading across both markets, consistency in the provision of information, financial risk management products that provide for effective hedging of both gas and electricity prices and more flexible gas pipeline services.

AEMO's latest forecasts show that gas used for gas-fired generation will decline at an annual average rate of 16.8 per cent between 2014 and 2019 due to low growth in electricity consumption and rising gas prices.<sup>37</sup> Notwithstanding this, we note that there may be growing opportunities for businesses to arbitrage wholesale gas spot prices and NEM spot prices, as has occurred with the start-up of QCLNG, and which may drive convergence between the NEM and east coast gas market.<sup>38</sup>

Further, growth in the penetration of renewable energy capacity, and how quickly this occurs, is likely to stimulate investment in gas-fired peaking plant to offset the intermittent nature of wind and solar. Analysis by AEMO shows that 25 per cent of proposed generation projects in the NEM is open-cycle gas turbine peaking plant.<sup>39</sup>

Overall, we consider a step change in convergence between the wholesale gas and electricity markets is unlikely to take place in the short to medium term. Given this, we do not see integration as a key development priority for the gas sector. However, to the extent there is scope for incremental development based on current levels of gas-fired generation, this should be explored if it leads to increased efficiencies for participants.

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<sup>37</sup> AEMO, National Gas Forecasting Report, 17 December 2014.

<sup>38</sup> EnergyQuest, EnergyQuarterly March 2015, p. 25.

<sup>39</sup> AEMO, 2015 Electricity Statement of Opportunities, Infographic.

## 5 Markets and networks priority

The AEMC adopted *market arrangements that encourage efficient investment and flexibility* as one of its three strategic priorities for energy market development in 2013. This priority reflects the importance of market and regulatory arrangements which promote efficient investment decisions.

In 2013, our market priority focussed on: market arrangements to attract the most efficient investments and the integration of external policies with the way that energy is bought and sold; policy and regulatory decisions being guided by how risks are allocated; and regulatory processes.

It is important that market and regulatory arrangements contribute to the right environment for business model evolution, while still promoting the consumer outcomes that are the objective of regulation. The AEMC is therefore retaining this strategic priority from 2013, while refocusing it on the areas where we see tensions likely to emerge over the next two to five years.

### 5.1 Why are markets still a priority?

We are in a period of significant change in energy markets. Changes in the costs of supplying energy, technological advances, changes in consumer preferences, changing patterns of demand and environmental policy requirements are all creating opportunities for new business models to develop. Products and services are emerging that are giving consumers greater information and choice about how they use energy. Policy developments external to energy market regulation – such as those discussed in chapter 2 (eg, climate change policies) – are also having a significant influence on how energy is bought and sold.

Regulatory frameworks need to be at once resilient and flexible. They must allow innovation and business evolution, both of which create value for consumers. They must also be resilient – being able to accommodate change while still achieving their regulatory objectives, and providing sufficient stability that investors are willing to make the significant sunk costs that are often involved in energy systems.

The priority will therefore be revised to reflect this focus: *market and network arrangements that encourage efficient investment and flexibility*.

### 5.2 How have the 2013 priority areas evolved?

In 2013, our market priority focussed on:

1. **Market arrangements** to attract the most efficient investments and the **integration of external policies** with the way that energy is bought and sold.
2. Policy and regulatory decisions being guided by **how risks are allocated**.
3. **Regulatory processes**.

## *Market arrangements and the integration of external policies*

In 2013, we identified that the wholesale electricity market had worked effectively since the NEM started, delivering a high level of supply reliability as a result of timely investments in new capacity and reliably operated plant.

The NEM had also delivered good customer outcomes, with average wholesale prices close to the long-run costs of generation. Previous analysis by the Commission found that "the comparison of LRMC (long run marginal cost) with wholesale spot and contract market outcomes for New South Wales, Queensland and Victoria shows results which are consistent with a wholesale electricity market that responds to the supply demand position broadly as would be expected of a workably competitive market."<sup>40,41</sup>

However, we were faced with a paradox: wholesale energy prices and energy demand were falling while retail prices were increasing. In part this was seen as the result of the RET pushing additional generation capacity into the wholesale market at a time that demand was falling. But it also led to concerns among some stakeholders that the market design itself might need to be changed. In Europe and the UK there were developments towards capacity payments to ensure system security and reliability in the presence of a large amount of intermittent generation.

Recently, the Energy Council has commented that the energy only market design of the NEM has proven to be robust and efficient, and that it does not support radical change to the market's design, or assistance to generators to exit the market.<sup>42</sup>

Notwithstanding this, we note that the NEM is in a disinvestment phase, with multiple thermal generators having been temporarily or permanently withdrawn from the market. With intermittent capacity in wind and solar making up a larger proportion of the energy mix, this may present a number of technical challenges going forward around managing power system security and reliability.

In our 2014 submission to the RET review, we highlighted that the wedge between retail and wholesale prices was problematic, representing a disconnect between the price faced by consumers on the one hand, generation sources on the other, and the underlying demand and supply. Over time, a properly functioning market is likely to be unsustainable when wholesale prices are not informing consumer choices in the retail market. We called for better integration of environmental policies with energy markets. We recommended transitioning the RET to an emissions intensity based scheme for the electricity sector.<sup>43</sup> We also highlighted the importance of an integrated

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<sup>40</sup> Australian Energy Market Commission, *Potential Generator Market Power in the NEM*, Final determination, AEMC, April 2013.

<sup>41</sup> We noted the exception to this trend in South Australia in the years 2007-08 to 2009-10.

<sup>42</sup> COAG Energy Council, December 2014 Communique, 11 December 2014.

<sup>43</sup> Australian Energy Market Commission, *Submission to the Review of the Renewable Energy Target*, 29 May 2014.

approach to energy and emissions reduction policies in our submission to the Emissions Reduction Fund safeguard mechanism consultation paper.<sup>44</sup>

Since 2013, the increase in retail prices has eased. Our 2014 price trends report found that residential electricity prices are generally flat or falling.<sup>45</sup> We expect these trends to continue, due mainly to the removal of the carbon price and expected lower revenue allowances for network businesses.

However, there remains an excess of capacity in the wholesale electricity market: AEMO identified surplus capacity between 7,650 and 8,950 MW across the NEM in 2014-15, depending on demand growth.<sup>46</sup> Some stakeholders are still calling for an overhaul of the NEM's energy-only design, whether that takes the form of some kind of capacity payment or for assistance for generators to exit the market.<sup>47</sup>

The AEMC maintains that the market is providing efficient signals for generator exit, as evidenced by the mothballing or permanent closure of plant in South Australia, Victoria, NSW and Queensland in recent years. Concerns about system reliability and security in the face of a changing generation sector, incorporating more intermittent generation, are best addressed through existing and forthcoming Council and Reliability Panel processes.<sup>48</sup>

#### *How risks are allocated*

Appropriate risk allocation is one of the fundamental questions in choosing a market design or form of regulation. Well-designed markets help to ensure that the risks associated with market investment are carried by businesses that make investment decisions. Risks should only lie with consumers where they are better able than industry players to make decisions and take action to mitigate those risks.

Questions of risk allocation were at the heart of two major reviews that were undertaken with the market priority in mind.

The NEM Financial Resilience review addressed systemic risks in the wholesale electricity market and associated financial arrangements. Our review concluded in March of this year, with the recommendation of a number of measures that should increase the resilience of these arrangements, particularly in cases where large or medium-sized retailers are experiencing financial difficulties.<sup>49</sup>

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<sup>44</sup> AEMC, Submission to the Emissions Reduction Fund Safeguard Mechanism Consultation Paper, 28 April 2015.

<sup>45</sup> AEMC, 2014 Residential Electricity Price Trends, Final Report.

<sup>46</sup> AEMO, *Electricity Statement of Opportunities*, August 2014.

<sup>47</sup> See, for example, AGL Applied Economic and Social Research, *Energy-only markets and renewable energy targets: complementary policy or policy collision?*, August 2014 (AGL Working Paper No. 43).

<sup>48</sup> In December 2014 the COAG Energy Council noted in its communique that "The Council will consider whether there are any material barriers to orderly exit and task the Australian Energy Market Operator (AEMO) with further investigations into appropriate pathways to ensure exit of generators does not jeopardise power system security."

<sup>49</sup> AEMC, NEM financial market resilience, Final Report, 6 March 2015.

The Transmission Frameworks Review recommended further work on the optional firm access model for transmission. The optional firm access, design and testing review concluded in June 2015. A fundamental question that was considered in this review was whether generators, through commercial decision-making, are better placed to manage the risk of transmission investment than network businesses. We concluded that the optional firm access model may lead to improved management of transmission investment risk, particularly if there is a high level of uncertainty with respect to investment patterns (ie, cost, technology type, and location). However, we recommended that the model should not be implemented currently since these conditions do not exist at present given oversupply of generation capacity, but that there is regular reporting and assessment on a series of drivers of transmission and generation investment.

Principles of risk allocation will remain fundamental to all of our work. But with the conclusion of these two major reviews, risk allocation will not be an explicit focus of this priority in 2015.

#### *New developments*

Technological changes are also emerging. Often driven by factors external to the energy sector, they could transform the nature of the energy sector – which creates both opportunities for value creation and potential challenges for the regulatory frameworks.

#### "Big data" and digital enablement

As consumers integrate more connected devices into their homes and install smarter meters, more and more data will flow back to energy businesses. Consumers are also generating exponentially more data in other parts of their lives, as they use the internet, use their mobile devices, make purchases online or in stores and use social media. The raw information generated by these interactions is called "big data". Big data enables new ways of segmenting and targeting consumers. It allows businesses to obtain an incredibly rich picture of consumer behaviour and motivations, trending towards creating the consumer segment of one individual.

A digital ecosystem is a network of companies, individual contributors, institutions and consumers that interact to create mutual value. In consumer oriented markets, ecosystems are enabled by standard technical platforms that allow devices, applications data, products and services to work together in new ways. For example the iOS operating platform, together with mobile Apple devices such as the iPhone, enables a digital ecosystem of mobile applications, products and services. Such systems can provide added value for consumers.

Together, these factors offer consumers the potential for far greater information and control of a range of devices, including their energy-using appliances. Companies other than energy retailers are also seeing opportunities to bundle energy services with other product offerings, as in integrated smart homes. Who will win the consumer in this space is highly uncertain at this time.

## Energy storage

Costs of battery storage are predicted to fall substantially in the next five to fifteen years, driven largely by developments in consumer electronics and the transport sector. The implications for the energy sector could be large since storage technologies have the potential to affect every part of the electricity supply chain.

Storage systems connected to power stations could allow generators to better manage variations in wholesale prices between times of high and low demand, or better integrate variable generation resources like large-scale wind.

Distributed storage systems may offer significant benefits to consumers with intermittent energy sources, such as the 1.4 million Australian households with rooftop solar PV, by allowing them to better match their generation to their usage needs.

Large-scale storage systems may be used by network businesses to reduce congestion, smooth network peaks, mitigate outages or provide network support in remote areas – all of which potentially reduce the need for spending on traditional network infrastructure, thereby reducing the cost of network services for consumers.

Which applications will prove the most valuable, and the point at which they may do so, is uncertain at this time.

We have recently announced that the AEMC has commenced a project, in collaboration with the CSIRO, which seeks to understand the future regulatory impact of the integration of storage technologies in the NEM.<sup>50</sup> Storage is being used as an example technology to help identify specific opportunities and potential challenges in the existing market frameworks as a way of assessing how the market can accommodate a range of technological advances.

## Changing nature of distribution networks

Widespread deployment of storage and other distributed energy resources (distributed generation, demand management schemes) could significantly alter the future for distribution networks. The overall level of network investment and the type of assets that should be invested in is subject to uncertainty. Network operations could also become more challenging in the face of more two-way flows of energy and the need to integrate distributed energy resources, which are subject to disaggregated decision-making about their usage and availability.

### **5.3 What are the areas of focus for the 2015 priority?**

Existing functions and roles in energy markets will be performed by new and different technology in the coming years. Given these new developments, it is therefore important that market and regulatory arrangements contribute to the right

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<sup>50</sup> See: <http://www.aemc.gov.au/News-Center/What-s-New/Announcements/AEMC-launches-project-on-integration-of-electricit>.

environment for business evolution, while still promoting the consumer outcomes that are the objective of regulation.

Given the parallels between some existing aspects of the regulatory framework and new technologies (for example, battery storage may be considered analogous to pumped storage), the existing regulatory framework provides a good foundation and framework to consider new technology and business models.

The AEMC is therefore retaining this strategic priority from 2013, while refocusing it on the areas where we see tensions likely to emerge over the next two to five years:

- **Technology and new business models:** How does regulation need to evolve to permit innovation in new products and services to the benefit of consumers, without eroding the customer outcomes that regulation intends?
- **Network evolution:** What will be the effect of technology on network investment and operation over the medium term? Will current regulation be appropriate for the business model evolution that may be required?
- **Wholesale markets:** How can policies in other portfolios be integrated with energy markets?

### **Technology and new business models**

We are entering an exciting but challenging period for energy market regulation. The way that consumers use energy is changing. A heightened awareness of prices, the penetration of household solar PV and efficiency improvements have already seen a change in usage patterns.

In coming years, we could see the evolution of a very different market. Companies might compete to offer energy services, not just the energy itself. They could manage the consumer's energy needs, managing the risk of procuring energy in a more dynamically priced environment, providing tools to respond to time-of-use pricing, optimising appliance settings, choosing when to charge electrical vehicles and when to sell stored energy back to the grid. Multiple companies may provide these and other services to the same consumer, rather than there being one point of contact with a traditional retailer.

New products and services have great potential to benefit consumers, but they also raise challenging issues for the AEMC as rule-maker. Consumer protection issues were discussed in the chapter 2 of this paper. A related issue is competitive neutrality. The regulatory frameworks need to find some balance between:

- limiting barriers to entry or innovation for these new business models; and
- bringing the new business models within regulation where that is important to consumer outcomes or to outcomes on the power system as a whole.

It is also important that inconsistencies in the application of regulation do not drive emerging business models to take a certain form, rather than consumer preferences.

The regulatory arrangements should be flexible to allow for evolving consumer preferences to be accommodated. This can be contrasted to the regulation of taxi companies, and the take-off of Uber. Slowness on the part of regulators in the face of a compelling value proposition and consumer preferences led to the emergence of a business model (in particular the ride-sharing service) that escapes some of the desirable aspects of transport regulation, and which creates an uneven regulatory burden on incumbent taxi operators.

### **Network evolution**

On the other side of the meter, time-varying network pricing, remote management of the consumer's energy supply, remote fault management and improved network management are already emerging as trends that rely on smarter monitoring and control. It is possible that distribution networks will evolve from one-way energy delivery systems into multi-directional urban "smart grids" that optimise the transport of energy from multiple sources – local and remote – and incorporate "time shifting" demand-side technologies to better manage peak demand.

As described above, the integration of storage and other distributed energy resources with the energy system creates a high degree of uncertainty for the future of distribution networks.

We consider that future work should focus on assessing whether:

- the boundary between competitive and regulated aspects of network operation needs to shift (eg, metering);
- the network businesses should be permitted to expand into other services (or prevented from doing so);
- the current risk-sharing mechanisms for network investment are appropriate; and
- further changes are required in the medium-term to assist network evolution.

### **Wholesale markets**

As discussed in chapter 2, environmental policy that is appropriately designed and integrated with the energy market can minimise the costs faced by consumers.

The factors we proposed in our 2014 submission to the RET Review remain a good starting point when considering the effective integration of energy and environmental policy:

1. The National Electricity Objective – explicitly accounting for the impact on wholesale and retail prices to reflect the underlying demand and supply conditions in the NEM, any impacts in efficiency, security, quality and reliability in electricity markets and the long term impacts on consumers.

2. Sustainable design – investors need a level of confidence that policy objectives can be met and are sufficiently robust to adjust to changes in market conditions. Without this confidence, investment will not be forthcoming.
3. Flexibility to adapt – for a policy to be sustainable there needs to be a reasonable opportunity to adapt to material changes in the market and regulatory landscapes, in a predictable and consistent manner. The policy should not be predicted on one view of the future.
4. Technology neutral – a policy that allows a broad range of technology options is likely to minimise costs for consumers.

Given the impact that policy decisions in other portfolios can have on the outcomes in the NEM the integration of these policies with energy market development remains a key element of this priority.