AEMC

REVIEW

Australian Energy Market Commission

ISSUES PAPER

Power of choice - giving consumers options in the way they use electricity

Commissioners

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Issues paper

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About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. The AEMC has two principal functions. We make and amend the national electricity and gas rules, and we conduct independent reviews of the energy markets for the MCE.

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Executive Summary

The National Electricity Market (NEM) is undergoing a period of change. Electricity demand—and peak demand in particular—is growing. Increased peak demand will require significant new investment in generation and network capacity, which will cause increases in costs for electricity services. Capturing the value of flexible demand by enabling consumers to make informed choices about the way they use electricity can help achieve efficient investment across the demand and supply sides.

What is the objective of this review?

The Ministerial Council on Energy (MCE) has directed the AEMC to, consistent with the National Electricity Objective (NEO), investigate and identify the market and regulatory arrangements needed across the electricity supply chain to facilitate the efficient investment in, operation and use of demand side participation (DSP) in the NEM.

We consider that the objective of this review is to identify opportunities for consumers to make informed choices about the way they use electricity, and provide incentives for network operators, retailers and other parties to invest efficiently so that there is increased confidence that demand and supply side options are given equal weight in satisfying the community's demand for energy services.

This Review is to have a broad focus, that is, it will consider all market and regulatory arrangements that impact on the electricity market supply chain, including the Rules, other national and jurisdictional regulations, commercial arrangements and market behaviours.

DSP opportunities

Cost effective DSP has the potential to improve the efficiency of the electricity market, for example through more efficient utilisation of transmission and distribution networks and providing added competitive discipline on retailers. This should result in lower costs to consumers for an equal level of reliability of supply. Wider benefits may include improved environmental quality (i.e. lower greenhouse gas emissions) and other benefits consistent with the broader policy objectives of government.

There has been some evidence of take up of DSP in the NEM in recent years, however traditionally consumers have tended to be passive parties in the electricity market, and both availability and uptake of DSP opportunities has been relatively low. There are a range of factors that may explain the relative lack of consumer participation and response. Some factors which have been recognised include electricity spend being a relatively small proportion of total household or business costs, presence of regulated retail prices, variation in the ability of different parts of the supply chain to access capital, lack of information on potential benefits of taking up DSP opportunities,

limited technical capability (e.g. measurement of energy consumption), and also lifestyle and behaviour.

Consumer interest and willingness to take up DSP opportunities will depend on their view of the value, preferences and benefit provided to them. As prices continue to rise, and become a more significant portion of costs and incomes, consumers may consider more innovative ways to either reduce or manage electricity consumption more efficiently. While prices and income play a significant role in determining consumption decisions, a range of other factors, such as those outlined above, also play an important role.

Giving choices to the consumer

For the purpose of this Review, we consider that DSP is defined as the ability of consumers to make informed decisions about the quantity and timing of their electricity use, which is derived from the value that they obtain from using electricity services. It is important to recognise that consumption of electricity services requires inputs other than just electricity; in particular, appliances are required which convert that electricity into useful outputs such as refrigeration, heat, light etc. It is therefore not only the price of electricity that will affect consumption decisions, but also the cost and availability of these complementary appliances.

A key assumption behind this review is that consumers will always make the best decision from their viewpoint, based on the prices they face, the technology and equipment they have access to, the information they have and their individual transaction costs. This means that we will not be pre-judging consumer decisions on how, when and how much they should be consuming at a given price level, but will be focusing on those factors above. This will also allow third parties to assist consumers make optimal decisions under innovative business models.

While consumer participation will be important to achieve efficient DSP outcomes in the market, other parties will need to have a strong interest in capturing the value of flexible demand and have a key role to play in sharing that value with consumers. For example, retailers may consider DSP as an alternative means of hedging wholesale electricity market spot price volatility (i.e. contracting with consumers to reduce load when prices are high). Network businesses may contract with a DSP provider as an alternative to network investment. DSP may also represent a valuable service to the system by enhancing the range of options available (e.g. as a means of avoiding involuntary load shedding) which in turn is likely to reduce costs.

Purpose of Issues Paper

The purpose of this Issues Paper is to seek views on current and likely future options for efficient DSP (i.e. DSP options), the market conditions that are required to facilitate and promote uptake by consumers and other parties of cost effective DSP options and any changes to the market and regulatory arrangements which are needed to promote those market conditions.

Those three concepts represent the main categories of market features that can contribute to facilitating and promoting efficient DSP:

- **DSP options** are the actions that are available to consumers - or to intermediaries acting as agents of consumers - to reduce or manage their electricity use. Examples of DSP by consumers can include (but are not limited to) peak shifting, electricity conservation, fuel switching, utilisation of distributed generation[1] and energy efficiency.

- **Market conditions** are features (e.g. information, systems, pricing structures, and technology) that need to be present in the electricity market to enable all parties (that is, consumers, retailers, aggregators, network operators, generators and other parties) in that market to make and implement informed decisions, while recognising that it is the consumer who makes the final consumption decision.

- **Market and regulatory arrangements** are the legislation, regulations, commercial arrangements and incentives which help to achieve the necessary market conditions by influencing the behaviour and informing the choices of participants (including consumers) in the electricity market.

Any changes that are recommended as a result of this review will be to the market and regulatory arrangements – with the aim of bringing about any necessary changes in the market conditions.

The key focus of this first stage of consultation is on identifying the range of DSP options that are or may be available to consumers, and the market conditions that need to be in place to facilitate and promote uptake of those options. Once we have formulated an initial picture of what cost-effective DSP options might be available to consumers, and the corresponding market conditions that might be needed (including any issues associated with these DSP options or market conditions), the review will turn to considering what market and regulatory arrangements might be required in order to promote those market conditions. While we are seeking initial views on the market and regulatory arrangements in this Issues Paper, the Directions Paper (to be published in November) will consult in more detail on this aspect.

The Terms of Reference (ToR) also require us to assess the potential for energy efficiency measures and policies to promote the efficient use of, and investment in DSP in the stationary energy sector. In this Issues Paper we are specifically seeking views on those energy efficiency policies and schemes that impact on, or seek to integrate with the NEM and facilitate efficient DSP.

A list of questions is provided below. Responses to those questions, or other issues raised by this paper, are welcome by Friday 26 August 2011.

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1 Distributed generation in the context of this review refers to generation located on a consumer's premises that may or may not be connected to a distribution network. It excludes standalone and scheduled generators, and generation connected to the transmission network.

List of Questions

Chapter 3 Methodology and assessment

1. **Chapter 3 outlines our approach to identifying "market and regulatory arrangements that enable the participation of both supply and demand side options in achieving an economically efficient demand/supply balance in the electricity market." Do you agree with our approach?**

2. **How should the benefits of DSP be measured? Can they be accurately quantified?**

3. **What are appropriate discount rates to apply to DSP investments for the various parties across the supply chain?**

4. **Are there other issues which we should consider in our assessment process and criteria?**

Chapter 4 Consumer participation and DSP opportunities

5. **What are considered the drivers behind why consumers may choose to change their electricity consumption patterns? Please provide examples or evidence where appropriate.**

6. **Chapter 4 lists some plausible DSP options that are currently used or could be used by consumers. Are there any other plausible DSP options currently used by consumers that have not been identified? Please provide description of measures and examples, where available.**

7. **Are there any DSP options that are currently available to consumers, but are not commonly used? If so, what are they, and why are they not commonly used (i.e. what are the barriers to their uptake)? Please provide examples and evidence if available.**

8. **Are there other DSP options that are not currently available to consumers, but could be available if currently available technologies, processes or information were employed (or employed more effectively) in the electricity (or a related) market?**

Chapter 5 Market conditions required for efficient DSP outcomes

9. What are considered the relevant market conditions to facilitate and promote consumer take up of cost effective DSP?

10 Are there any specific market conditions which may need to be in place to enable third parties to facilitate consumer decision making and capture the value of flexible demand? Please provide examples and evidence as appropriate.

11. What market conditions (technologies, processes, tariff structures, information etc) are needed, that are not currently employed in the electricity market, to make other DSP options available to consumers?

Pricing

12. Do you consider retail tariffs currently reflect the costs to a retailer of supplying consumers with electricity?

13. Are any changes needed to retail price regulation to facilitate and promote take up of DSP?

14. Do the charges to retailers for use of transmission networks reflect the value of that use?

15. Do the charges to retailers for use of distribution networks reflect the value of that use?

16. Do all consumer groups, including vulnerable consumers benefit from having cost reflective prices in place? If not, are any special provisions required to protect certain classes of consumers?

Information

17. To what extent do consumers understand the how they can reduce their electricity bill? What information do consumers need in order to increase their understanding of how they can reduce and manage their electricity consumption and hence bills?

18. What issues are associated with provision of existing information in the market? Are there arrangements that could improve delivery of such information? If so, how and by whom?

19. Could better information be provided to consumers regarding the actual consumption of individual appliances and pieces of equipment? If so, what information could be provided and in what form?

Pricing options, products and consumer incentives

20. Are retailer and distributor business models supportive of DSP?

21. What incentives are likely to encourage research and development of other parties to promote efficient DSP?

22. Are there any regulatory, cultural or organisational barriers that affect take up of DSP opportunities?

23. What form of commercial contracts/clauses are required for facilitating and promoting efficient DSP?

Incentives to invest and access to capital

24. Are there specific issues associated with investment in infrastructure needed for consumers to take up DSP opportunities?

25. Do you consider that the issue of split or misaligned incentives has prevented efficient investment in DSP from taking place?

26. What are potential measures for addressing any issues associated with split or misaligned incentives?

27. Are there specific issues concerning ease of access to capital for consumers and other parties?

Technology and system capability

28. What are the significant energy market challenges in optimising the value of technology and system capability to facilitate an efficient level of DSP?

29. Do current technology, metering and control devices support DSP? If not, why not, and what are considered some of the issues?

30. How can issues relating to weak and/or split incentives be addressed to ensure that the benefits of smart grid technologies are aligned and felt across the electricity supply chain, including by consumers?

31. How can pricing signals/tariff arrangements be made complementary with smart grid technologies to facilitate efficient DSP in the NEM?

32. In maximising the value of technologies, such as smart grids for DSP, what are the issues relating to consumer protection and privacy?

Chapter 6 Market and regulatory arrangements

33. To what extent do parties have appropriate incentives to put in place the systems, technologies, information flows etc that facilitate efficient DSP?

34. Are there aspects of the NEL or the Rules which prevent parties taking actions that would otherwise allow for more efficient levels of DSP?

35. Are there market failures which mean regulation is needed in some areas to ensure appropriate market conditions are in place?

Chapter 7 Energy efficiency measures and policies

36. What energy efficiency policies and schemes should be considered as part of this Review, i.e. as impacting on, or seeking to integrate with the NEM?

37. To what extent can energy efficiency policies and schemes be adopted as options for enhancing the efficiency of DSP in the NEM? What are the strengths and limitations of energy efficiency policies as a DSP option compared to other options?

38. To what extent do existing retailer obligation schemes facilitate efficient choices by consumers in their electricity use? Are there aspects of those schemes that facilitate efficient consumption choices more than others? If so, please explain.

Contents

1 Introduction

On 29 March 2011, the Ministerial Council on Energy (MCE) directed the AEMC to undertake a review of DSP in the National Electricity Market (NEM). This Review is entitled: the Power of Choice - giving consumers options in the way they use electricity.[2]

This Review arises from the AEMC's Stage 2 Review of DSP in the NEM, which was undertaken with explicit focus on the National Electricity Rules (rules). For the Stage 2 DSP Review, we concluded that, in the context of the current technology and other related work, the rules do not materially bias against the use of DSP in the NEM. In addition, overall, the costs and opportunities to participate in demand side activities provided by the rules framework are appropriate. We also considered that there was a need to further consider DSP matters more generally in the NEM (i.e. broader than the rules) given the emergence of smart grid and smart meter technologies.

The MCE generally supported the findings and recommendations of the AEMC Stage 2 Review and considered that there was a need to further review DSP matters in the NEM. The MCE considered that a further review of DSP in the NEM should be undertaken given the need to investigate the issues associated with realising the benefits that may be achieved from smart grid/smart meter deployment. Further, that this Review would need to consider a number of key elements of MCE requirements under the Council of Australian Governments' (COAG) National Strategy on Energy Efficiency (NSEE)[3]. These key elements included examining the efficient operation of price signals and the regulatory arrangements for energy efficiency to promote efficient DSP in the NEM.

1.1 MCE Terms of Reference

1.1.1 Objective of the review

The MCE has directed the AEMC to investigate and identify the market and regulatory arrangements needed across the electricity supply chain to facilitate the efficient investment in, operation and use of DSP in the NEM, consistent with the National Electricity Objective (NEO).

We consider that the objective of this review is to identify opportunities for consumers to make informed choices about the way they use electricity, and provide incentives for network operators, retailers and other parties to invest efficiently so that there is

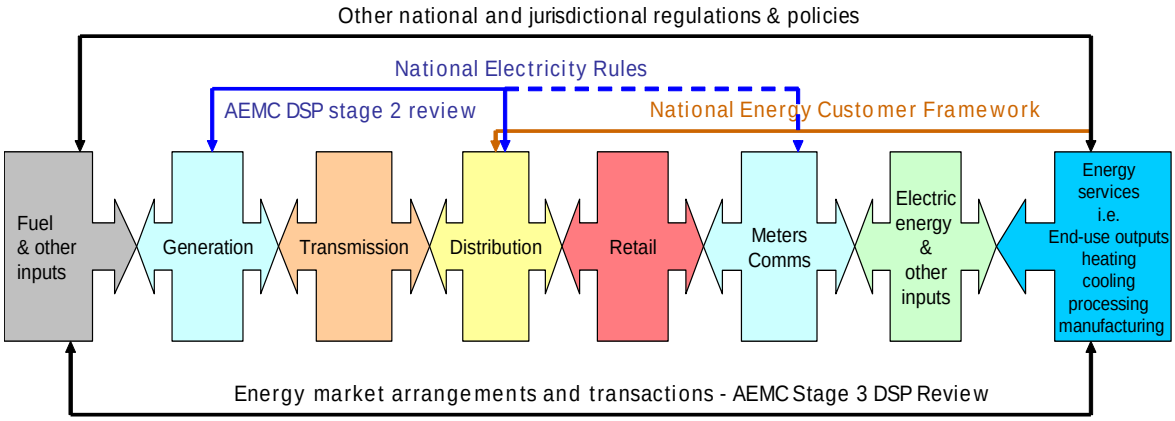
2 MCE Terms of Reference for the Review: http://www.aemc.gov.au/Media/docs/MCE%20Terms%20of%20Reference-35e6904a-e39d-4348-8ad5-1a7970af354d-0.pdf.

3 See NSEE Measure 2.1.1, Consideration of the effectiveness of the electricity market in bringing forward demand side energy efficiency measures at http://www.coag.gov.au/reports/index.cfm#energeff.

increased confidence that demand and supply side options are given equal weight in satisfying the community's demand for electricity services.

The Review will have a broad focus; that is, it will consider all arrangements that impact on the electricity supply chain, the rules, other national and jurisdictional rules and regulations, commercial arrangements, and market behaviours (see Figure 1.1 below).

Figure 1.1 Scope of the review



1.1.2 Definitions

Demand side participation

For the purpose of this Review, we consider that DSP refers to the ability of consumers to make informed decisions about the quantity and timing of their electricity use, which reflects the value that they obtain from using electricity services.

DSP options

DSP options are the actions that are available to consumers - or to intermediaries acting as agents of consumers - to reduce or manage their electricity use. Examples of DSP options that consumers (or other parties acting on their behalf) may deploy, include, but are not limited to, measures such as peak shifting, electricity conservation, fuel switching, utilisation of distributed generation[4] and energy efficiency[5].

4 Distributed generation in the context of this review refers to generation located on a consumer's premises that may or may not be connected to a distribution network. It excludes scheduled generators and generation connected to the transmission network.

5 Improvements in energy efficiency is defined as using less energy to achieve the same level of output, or improving the level of output from the same amount of energy (Prime Minister's Task Group on Energy Efficiency, Final Report, 2010, p. 27).

Market conditions

For this Review, market conditions refer to the features that need to be present in the electricity market to enable all participants (that is, consumers, retailers, aggregators, network operators, generators and other parties) in that market to make and implement informed decisions, while recognising that it is the consumer who makes the final consumption decision. These features may include information, systems, pricing structures and technology etc.

Market and regulatory arrangements

Market and regulatory arrangements refer to the measures that facilitate the market conditions. These can include all the legislation, regulations, commercial arrangements and incentives which help to achieve the necessary market conditions by influencing the behaviour and informing the choices of parties (including consumers) who participate in the electricity market.

For example, in order to reduce their consumption (a DSP option) consumers may require access to accurate information on their electricity usage (a market condition). Market participants and other service providers may need to be provided with incentives or obligations (potential market and regulatory arrangements) to provide such information to assist consumers in making informed decisions.

1.1.3 Scope of the review

This review will consider all the market conditions that have the potential to impact on DSP. In addition, the MCE's Terms of Reference (ToR) specifically require this Review to consider the following key areas:

- market frameworks to maximise value to consumers from services enabled by new technologies (such as smart grid/smart meter and load control capability);
- effectiveness of regulatory arrangements for energy efficiency (such as retailer obligation schemes); and
- efficient operation of price signals that includes the tariff setting process and incentives for operating and capital expenditure.

The AEMC will also consider any other matter relevant to the objective of the Review.

1.1.4 What is not covered in the review

There are a range of areas that will not be covered in this Review. While we will not directly investigate these areas, we shall nevertheless take note of relevant issues raised during the course of the Review. The areas that are not directly in scope for the review include:

- economic regulation frameworks including a review of the rate of return or merits review process. The Australian Energy Regulator (AER) is conducting a

review of the revenue regulation rules following its first cycle of network revenue determinations. The AEMC will wait for this work to be completed;

- reliability and security standards for the NEM. There is an established process for setting these and any changes should be made as part of that process;
- review of reliability planning and service standards for networks (jurisdictional arrangements);
- specific consideration of a mandated or non-mandated rollout and metering contestability of smart meters. These matters are subject to separate MCE processes;
- technical generator and network (losses) efficiency; and
- gas markets.

1.1.5 Timetable and process

The indicative timetable for the Review is provided below.

Document	Purpose	Date
Issues Paper	Sets out and seeks views on the issues considered to be relevant to the Review - i.e. the factors affecting the quantity and timing of electricity use made by consumers.	Submissions close by 26 August 2011
Directions Paper	Provides an assessment of the potential for DSP in the NEM and confirms the market conditions required across the supply chain. Directions on possible market and regulatory arrangements may also be identified.	November 2011
Public Forum	To receive stakeholder input regarding the findings in the Directions paper.	During consultation phase of Directions paper
Draft Report	Seeks to identify the set of feasible reform options based on market conditions that need to be in place across the supply chain.	May 2012
Public Forum	To receive stakeholder input regarding the findings in the Draft report.	During consultation phase of Draft Report

Document	Purpose	Date
Final Report	Provides our findings and recommendations to the MCE, which is supported by evidenced-based reasoning. It will also provide an implementation plan and timeline for action.	September 2012

1.1.6 Stakeholder consultation

As part of the Review, we will be undertaking a transparent process to identify, assess and develop recommendations for reform. We will be engaging with stakeholders through a series of consultation papers, bilateral discussions, public forums and with the Review's Stakeholder Reference Group (SRG). Stakeholders are encouraged to provide submissions, and participate in bilateral and public forum processes so as to ensure all issues are canvassed and can be considered.

Stakeholder Reference Group

We have established a SRG with membership comprising representation from all sectors of the electricity industry, electricity users, environmental and consumer advocacy groups, market institutions, relevant government agencies and academics to provide advice for this Review. The first meeting of the SRG was held on 8 June 2011. Outcomes of the meeting and a full list of the SRG membership can be found at www.aemc.gov.au.

1.1.7 Linkages to other work

It is noted that there are a range of issues which impact or may link with existing work being undertaken by the AEMC, MCE, and other energy market institutions. We note that there also may be links to broader processes external to energy market reforms by Australian and state governments. Hence, as part of the Review, we will consider interactions with those existing work programs and processes underway so as to ensure synergies are maximised. The work programs of particular relevance include:

- Outcomes of the MCE's National Smart Meter Program;
- MCE Review of customer protection and safety arrangements under National Energy Customer Framework;
- MCE response to AEMC advice on cost-recovery of mandated smart metering infrastructure;
- MCE statements of policy principles on smart meters;

- Australian Government's Smart Grid, Smart City initiative (and work of proposed Strategic Policy and Regulatory Steering Committee); and
- Australian Government's response to the Prime Minister's Task Group on Energy Efficiency.[6].

1.1.8 Submissions

The closing date for submissions to this Issues Paper is 26 August 2011. Submissions should quote project number EPR 0022 and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

In providing submissions to the Review, stakeholders are encouraged to give evidence, data and any other information (for example, case studies) to support any issues raised. We recognise that this material might contain information that is confidential in nature. All information, including confidential information, will be treated in accordance with the AEMC's submissions guidelines which can be viewed at www.aemc.gov.au.

1.2 Structure of this paper

This Paper is structured as follows:

Chapter 1 - provides the context and rationale for the review and identifies some of the drivers for DSP in the NEM;

Chapter 2 - provides the proposed methodology and assessment process for identifying and evaluating market and regulatory arrangements which may be required as an outcome of the Review;

Chapter 3 - outlines why consumers may seek to engage in DSP in the NEM and outlines the range of plausible DSP options currently available;

Chapter 4 - discusses some of the market conditions that may need to be in place for consumers to make informed choices as to the way they use electricity and the incentives needed for other parties to capture the value of flexible demand;

Chapter 5 - outlines our approach to identifying market and regulatory arrangements that we may need to consider to facilitate and promote consumer choice and take up of DSP opportunities; and

Chapter 6 - outlines our proposed approach to evaluating energy efficiency policies and programs that impact on or seek to integrate with the NEM as required under the MCE ToR.

6 www.cleanenergyfuture.gov.au

2 Demand side participation in the electricity market

This Chapter provides the context and rationale for further reform of DSP in the NEM, and hence the basis for this Review. This Chapter also outlines, at a high level, the current drivers of demand and supply of electricity in Australia and across different sectors of the market.[7]

2.1 Rationale for DSP in the National Electricity Market

Over the last decade, Australia's electricity markets have been generally robust, and have delivered substantial benefits to consumers, with increased productivity and competition, strong investment and reliable supplies of electricity.

Nevertheless, Australia's electricity supply sector is undergoing a significant period of change which is likely to test the existing market arrangements and market frameworks. Significant recent changes include: the New South Wales government sale of energy sector retail businesses; the expanded Renewable Energy Target (expanded RET) which came into effect on 1 January this year; the Australian Government's announcement for a clean energy future plan, that includes putting a price on carbon and developing further energy efficiency measures as recommended in the Final Report of the Prime Minister's Task Group on Energy Efficiency.

Future challenges for the market include the need for significant new investment across the supply chain (and access to capital) to meet forecast increases in demand and to implement low cost responses to address climate change. The effect of this investment will be increases in electricity prices for consumers.

In this context, the above challenges provide an opportunity to enhance flexible demand in the NEM and to capture the value of that flexibility. Market and regulatory arrangements across the entire electricity supply chain need to be considered to support the market conditions necessary for a more flexible demand side. This would ensure that the demand side is able to compete with the supply side to achieve an economically efficient supply/demand balance.

2.2 Drivers of demand and supply of electricity in Australia

The demand for electricity from customers is a derived demand as the power will be used as an input into providing services or making goods. It is not required for direct consumption, but it is used to produce something useful (e.g. heat, light, other goods). The value of electricity to a consumer is a function of the value derived from its use, for example:

- the demand of residential consumers is determined by their own value (for heat, light, refrigeration etc); and

7 The MCE Terms of Reference requires the AEMC to investigate DSP matters in the National Electricity Market.

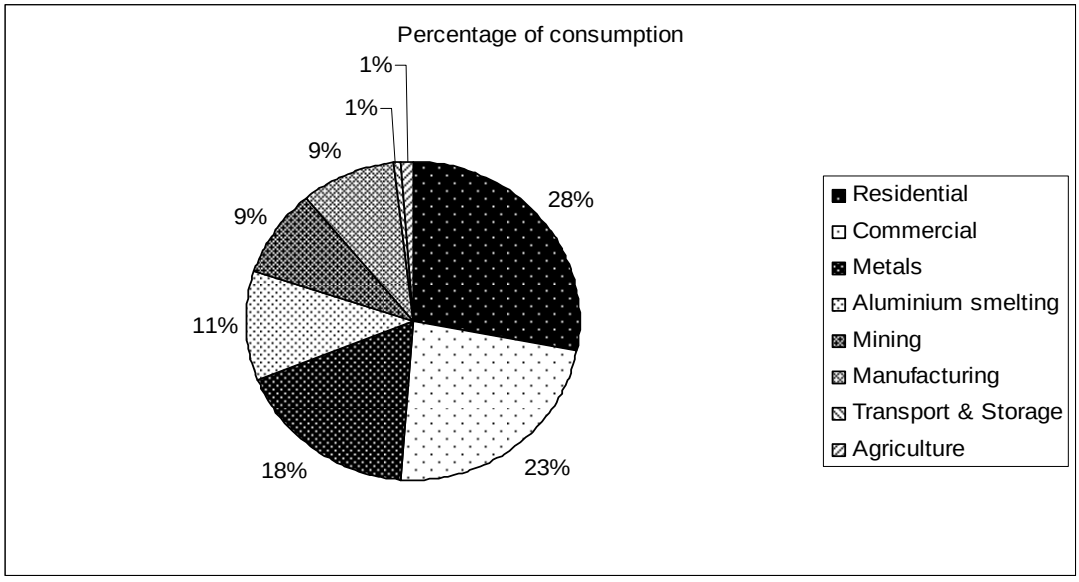
- the demand of non-residential consumers is determined by the value of goods/services that they produce or sell, where such goods/services require electricity as an input into their production.

It is important to recognise that consumption of electricity services requires inputs other than just electricity. In particular, appliances are required which convert that electricity into useful outputs such as refrigeration, heat, light etc. This derived nature of electricity demand (and the requirement for complementary inputs) will impact on the flexibility of consumer demand and choices. DSP will occur if consumers see the value in, and have the means to change their consumption.

Electricity consumption by sector

As depicted in Figure 2.1, in 2008/2009 financial year, residential electricity customers accounted for about 28 per cent of consumption while industrial and commercial electricity customers accounted for about 72 per cent of consumption.[8]

Figure 2.1 Electricity consumption by sector[9]



The supply of electricity at cost effective prices for businesses is a key factor driving economic prosperity and growth in Australia. The expectation of continued strong economic growth is expected to drive greater demand for energy services. This includes peak demand growth as increasing prosperity allows more people to install air conditioning and purchase other appliances that consume significant amounts of energy.

8 Electricity Supply Association of Australia (2010), Electricity Gas Australia at p. 27.

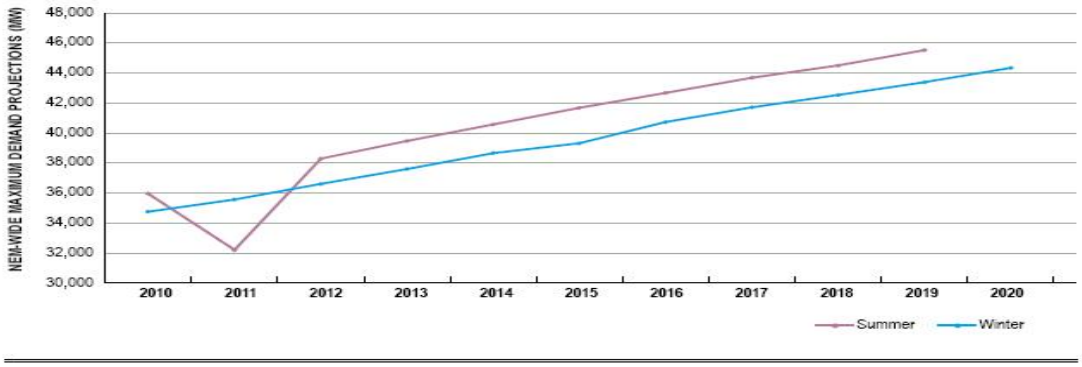
9 Ibid.

Energy and peak demand

Over the previous decades, energy demand in Australia has increased significantly. For example, it is estimated that annual energy consumption for residential customers in Queensland has increased from 2 MWh in 1966 to about 7.5 MWh in 2010.[10] Furthermore, since 2005 peak demand[11] in the NEM has grown by 3.5 per cent a year and is forecast to grow by a further 2.6 per cent a year through to 2020.[12] This compares to growth of 1.2 per cent a year in energy demand since 2005, and forecast energy demand growth of 2.1 per cent a year to 2020.[13] This growth in peak demand will feed through into the need for more investment in generation and expanded network capacity, while additional investment will also be required to replace ageing network assets.

Although there has been growth in energy demand since 2005, there is some emerging evidence that suggests that average energy consumption by households may be falling - at least in some states. The Independent Pricing and Regulatory Tribunal (IPART) published a survey at the end of last year suggesting that average energy consumption for households in New South Wales fell by 5 per cent over the five years to 2009-2010.[14] If this trend proves to be sustained, it could have significant implications for the recovery of investment costs, as the greater the gap between average and peak demand, the higher will be the fixed costs per unit of consumption. This highlights the importance of enabling efficient levels of DSP, so that investment in meeting peak demand is no higher than necessary.

Figure 2.2 Summer and winter peak demand forecasts for the NEM[15]



10 P Simshauser, D Downer "Limited form dynamic pricing: applying shock therapy to peak demand growth" AGL Applied Economic and Policy Research, Working Paper No. 24 - Dynamic Pricing, February 2011, p. 3.

11 The maximum summer demand is the peak demand period in the NEM, although some regions of the NEM have their maximum demand in winter.

12 Australian Energy Market Operator (AEMO) 2010, Electricity Statement of Opportunities, p. 37.

13 AEMO 2010, Electricity Statement of Opportunities, p. 35.

14 IPART 2010, 'Residential energy and water use in Sydney, the Blue Mountains and Illawarra, Results from the 2010 household survey, Electricity, Gas and Water - Research Report'.

15 AEMO at www.aemo.gov.au

As evident in Figure 2.3 and Figure 2.4, electricity demand varies markedly during different times of day and different times of the year. This variability in the wholesale spot price is a function, in part, of the variability in demand, but it is also a function of variability in supply. Generation and network assets are deployed to meet the peak demand in accordance with reliability and service standards desired by consumers and determined by regulators and governments.

Figure 2.3 Trading Interval Price and Demand: Victoria[16]

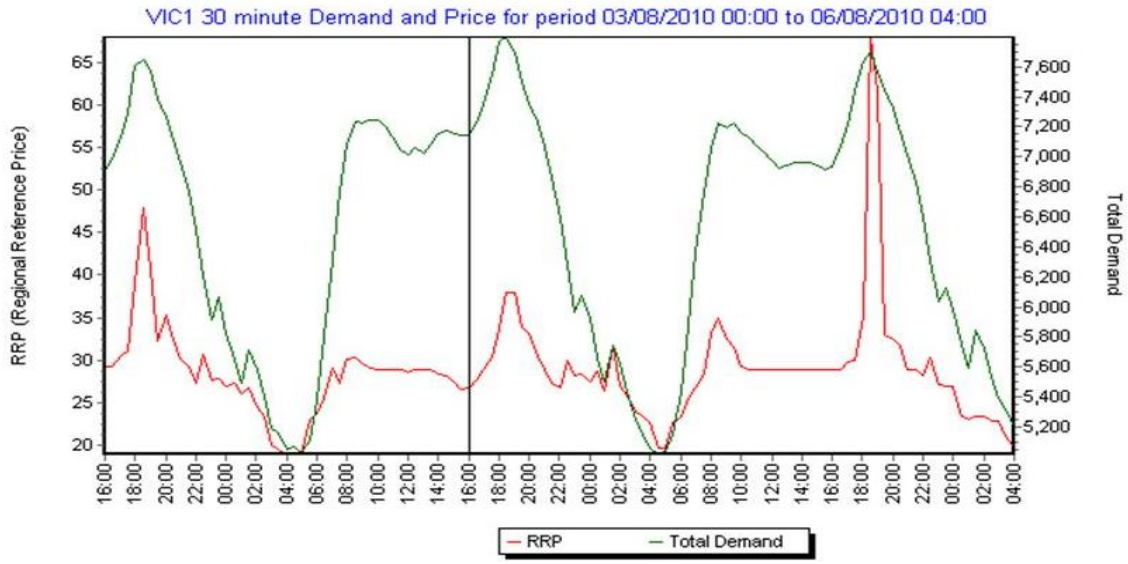
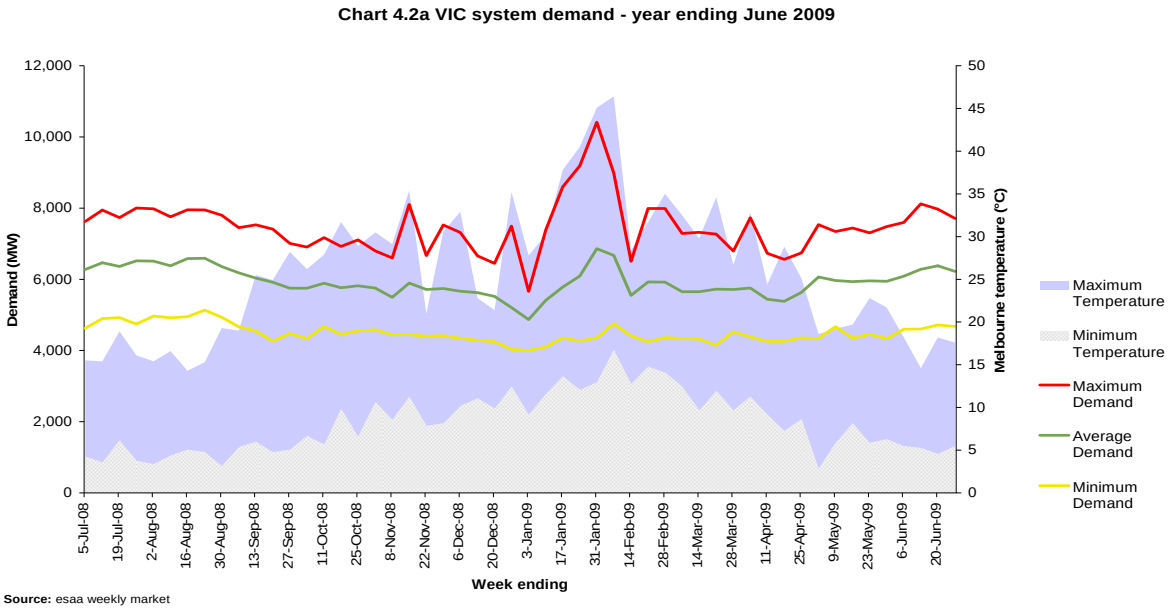


Figure 2.4 Victoria System Demand - year ending June 2009[17]

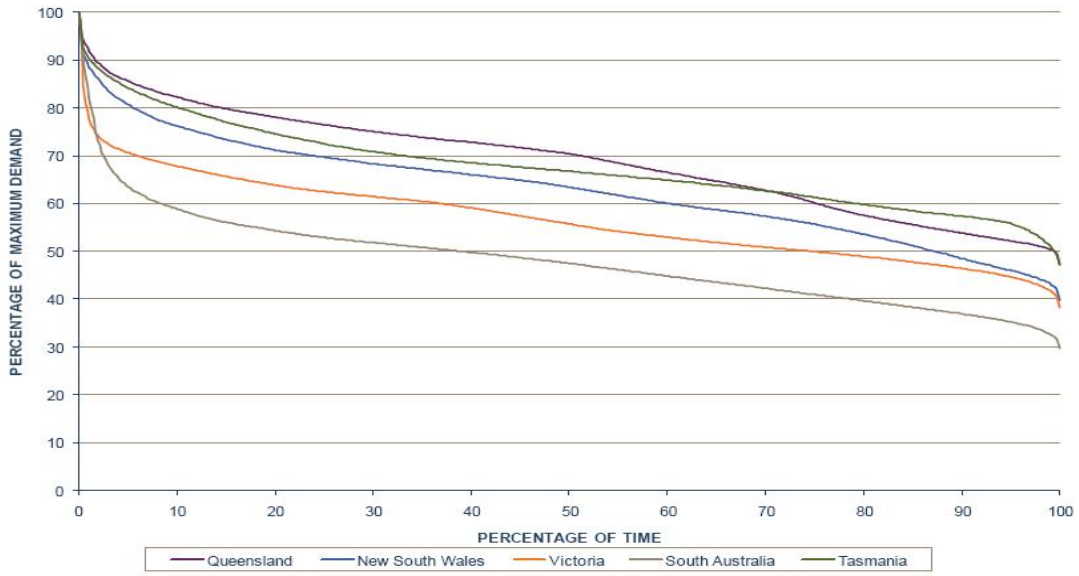


16 Refer to www.aemo.com.au

17 ESAA 2010, Electricity Gas Australia at p. 31.

In Figure 2.5, the load duration curves provide some context to the peak demand and its variability in the NEM. With reference to the load duration curve in Victoria, for example, demand exceeded 75 per cent of the maximum demand on fewer than 10 days in the 2008/2009 financial year.[18] Generation and network assets are built to meet this maximum demand. Stakeholders have expressed concerns that assets are not utilised efficiently because of the "peaky" nature of electricity demand. The "peaky" nature of electricity demand is suggestive of a declining load factor (the ratio of average demand to peak demand) in the NEM. At least within the residential sector, it is plausible that some of the drivers behind peak demand could be attributable to the actual and predicted growth of electrical appliance consumption (for example, more widespread use of air-conditioners) and the rapid increase in the average size of new homes, which increases household energy use.[19]

Figure 2.5 Load Duration Curve for 2008/09 Financial Year[20]



Infrastructure needs

Growth in electricity demand and replacement of ageing assets will require an investment of $38bn in networks over the current five year regulatory period.[21] Generation investment under a moderate emission reduction scenario is estimated at $33 - $37 billion to 2020.[22]

18 AEMO 2009, Electricity Statement of Opportunities, p.10-3.

19 Department of Environment Heritage, Water and the Arts 2008, Energy use in the Australian Residential Sector 1986 -2020.

20 Source: AEMO 2009, Electricity Statement of Opportunities at 10-3.

21 Investment Reference Group 2011, A Report to the Commonwealth Minister for Resource and Energy, p.15.

22 Ibid, p.16.

Retail electricity prices

Retail electricity prices have risen by up to 30 per cent in Australia over the last three to four years.[23] Figure 2.6 demonstrates the projected increase in retail electricity prices in the next few years.[24] In addition, Figure 2.7 illustrates the past and projected relationship between the proportion of weekly household income that is represented by an electricity bill against the average annual household cost of electricity. It is projected that by 2015, an electricity bill will represent 2.5 per cent of average household income.

Figure 2.6 National residential electricity price index[25]

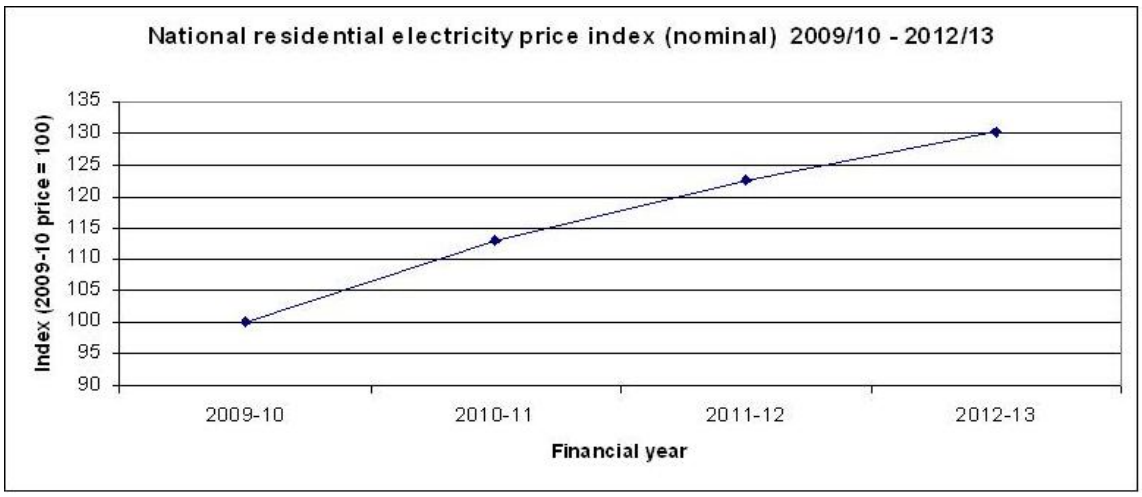
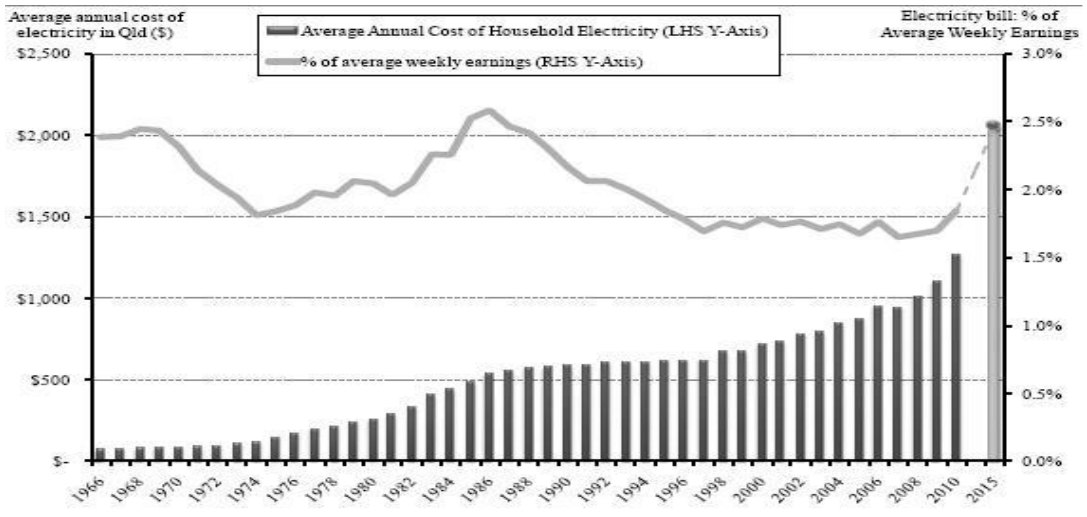


Figure 2.7 Average annual electricity bill vs. average weekly earnings[26]



23 AER 2010, State of the Energy Market, p.104.

24 AEMC 2010, Future Possible Retail Electricity Price Movements: 1 July 2010 to 30 June 2013, Final Report, p.14.

25 Ibid.

26 P Simshauser, D Downer, "Limited form dynamic pricing: applying shock therapy to peak demand growth" AGL Applied Economic and Policy Research, Working Paper No. 24 - Dynamic Pricing, February 2011, at p. 3.

There are several factors contributing to this increase in retail electricity prices. These factors include: a requirement for further investment to meet peak demand growth; the costs associated with replacement of ageing assets; the cost associated with renewable energy schemes; and the costs of meet jurisdictionally determined reliability standards against a background of higher cost of capital since the global financial crisis. In addition, a potential price on carbon and measures to address climate change, are likely to put further upward pressure on retail electricity prices.

2.3 The benefits of DSP in the National Electricity Market

Cost effective DSP has the potential for electricity users to more effectively manage the cost of their consumption as Australia's energy markets undergo a period of change and transition to a low carbon economy. Cost effective DSP has the potential to improve the efficiency of the electricity market, for example through more efficient utilisation of transmission and distribution networks, provide for greater efficiency in consumption, and providing added competitive discipline on retailers. This should result in lower costs to consumers for an equal level of reliability of supply. Wider benefits also may include improved environmental quality (i.e. lower greenhouse gas emissions) and other benefits consistent with the broader policy objectives of government.

All participants in the electricity supply chain have a role to play in facilitating efficient DSP outcomes and consequently benefiting as well. For consumers, DSP may offer an opportunity to reduce their energy costs. For networks, contracting for DSP may offer the opportunity to improve the efficiency of their investments. For retailers, DSP may offer an opportunity to reduce exposures to pool price risks or capitalise on information advantages in regard to energy efficiency, load management or local generation. DSP may also offer commercial opportunities to other parties such as aggregators and energy service companies (ESCOs).

2.4 Existing DSP in the electricity market and reforms to date

While recognising that there are various ways in which DSP may be provided in the NEM, the volumes of such participation are uncertain. However there is some evidence of DSP occurring in the NEM. According to AEMO's survey of DSP, there were 719 MW of DSP available in 2010 of which 131 MW was committed.[27]

It is difficult to determine how much DSP is used by retailers given that their hedge positions are, necessarily, not in the public domain. However, there is empirical and anecdotal evidence that there is a material level of DSP. AER investigations into high-price events in the wholesale market have identified evidence of probable demand response at times of high prices. For example, there was an apparent demand

27 AEMO 2010, Electricity Statement of Opportunities, p. 70.

reduction of up to 265 MW in NSW following a price spike of over $6 200/MWh on 10 August 2010.[28]

Distribution networks may also deploy DSP solutions and there are various obligations on distribution networks to consider non-network options when engaging in further investment in their networks. Also, in some states, the AER has applied a demand management incentive scheme to particular distribution determinations to encourage the uptake of DSP.[29] In NSW, for example, Ausgrid (formerly EnergyAustralia) undertook 29 demand management investigations and concluded that 5 projects were cost effective DSP solutions.[30] Transmission networks have used demand side options for the purpose of network support.[31]

There is anecdotal evidence that large users (notably, major industrial users) engage in DSP as well.[32] This typically occurs where usage of the plant/equipment may be reduced or even completely switched off in response to relatively high wholesale electricity spot prices.

Previously, AEMO has also utilised the services of demand side providers in contracts for reserves to increase reliability of supply.[33]

A number of reforms have been introduced in the NEM regarding the uptake of DSP. These reforms act as a starting point for any further reforms needed to facilitate efficient DSP in the NEM. An overview of the reforms to date is outlined in Appendix A.

28 AER 2010, Electricity spot prices above $5000/MWh report New South Wales, 10 August 2010.

29 AER 2010, State of the Energy Market, p. 66.

30 EnergyAustralia 2010, Annual Report 2009/10, p. 27.

31 AEMC 2009, Review of Demand-side Participation in the National Electricity Market, Final Report, p. 5.

32 AEMC 2011, Stakeholder Reference Group discussions, 8 June 2011.

33 AEMC 2009, Review of Demand-Side Participation in the National Electricity Market, Final Report, p. 6.

3 Methodology and assessment criteria for identifying and evaluating market and regulatory arrangements for DSP

3.1 Purpose

The purpose of this methodology and assessment criteria is to facilitate rigorous, consistent and transparent analysis of any changes to market and regulatory arrangements that may be required as an outcome of this Review, in accordance with the NEO.

3.2 Economic framework

The objective of the review is to "seek to identify market and regulatory arrangements that enable the participation of both supply and demand side options in achieving an economically efficient demand/supply balance in the electricity market."[34]

The aim, therefore, is to promote use of DSP up to the point at which the value of reducing demand by an extra kWh is equal to the cost of supplying an extra kWh of electricity. This means giving consumers the ability to adjust their demand where the cost of consuming electricity exceeds the value they place on it (determined by their derived demand for heat, light etc). Theoretically, consumers will be able to interact efficiently in the market when they:

1. face the price that reflects the underlying value of resources;

2. are able to adjust their consumption in response to that price; and

3. see value in responding (taking into account transaction costs).

That is, in order to participate in the market, consumers must have an incentive, ability and willingness to adjust their consumption pattern. In Appendix B, we map out all the features that would theoretically need to be in place in the market to achieve those three conditions. It is important to note though that the review will not attempt to establish all of those individual features in the NEM – in many cases the costs of having them in place in practice are likely to outweigh the benefits.

3.3 Assessment criteria

The assessment criteria established for this review would apply the NEO to the range of issues and options identified for the review. This section briefly explains how we intend to apply the NEO and factors that would lead to its promotion.

34 MCE Terms of Reference for the Review: http://www.aemc.gov.au/Media/docs/MCE%20Terms%20of%20Reference-35e6904a-e39d-4348-8ad5-1a7970af354d-0.PDF.

3.3.1 Application of the NEO

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:
>
> 1. price, quality, safety, and security of supply of electricity; and
>
> 2. the reliability, safety and security of the national electricity system."

The focus of this review is on promoting the long term interests of consumers with respect to the price of the supply of electricity, through promotion of efficient use of and investment in electricity services. This is likely to also promote more reliable and secure supplies.

Under the assessment criteria, DSP options will be required to meet the quality, safety and reliability standards that have been established for the electricity market. Where relevant, the impact of DSP on reliability and security of supply will be noted, particularly where DSP contributes to an improvement. Consideration will also be given to market conditions that facilitate outcomes based on the value customers place on reliability and security of supply with a view to accommodating consumers who may choose to "opt out" of the NEM reliability and security standards.

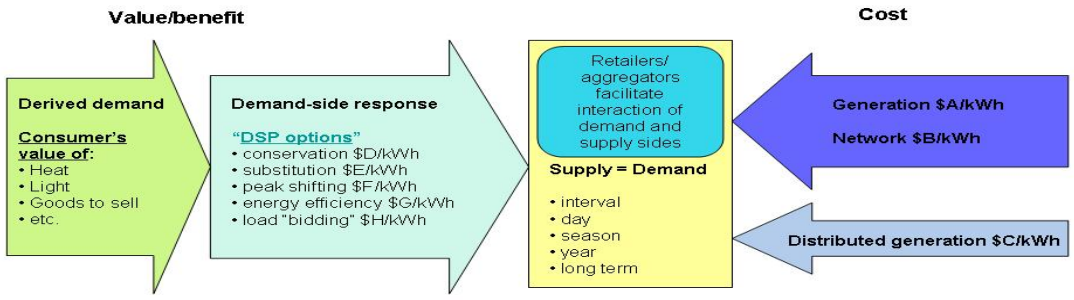
A key assumption behind this review is that consumers will always make the best decision from their viewpoint, based on the prices they face, the technology and equipment they have access to, the information they have and their individual transaction costs. This means that we will not be pre-judging consumer decisions on how, when and how much they should be consuming at a given price level, but will be focusing on those factors above. This will also allow third parties to assist consumers make optimal decisions under innovative business models.

Based on their derived demand for energy services, consumers decide what level of energy services gives them the most value taking into account the costs they face in obtaining these energy services. The complexity and costs consumers face in obtaining and processing information and entering into transactions mean that consumer preferences relating to electricity consumption are likely to vary across and within specific consumer classes, in response to factors such as income levels and value of leisure time. As members of the Stakeholder Reference Group (SRG) highlighted, heuristics and habits, as well as factors such as the size and make-up of a household, will impact on how consumers make decisions about electricity use.[35] This will lead to a variation in the preferences among consumers for investment in energy efficient appliances and equipment, and will affect the rate of adoption of energy efficiency measures that require capital investment.

35 AEMC Review: Power of Choice Stakeholder Reference Group First meeting 8 June 2011 www.aemc.gov.au

The optimal (efficient) use of resources from a societal viewpoint will occur when the lowest cost combination of DSP and traditional supply options is used to meet demand. Hence the assessment will be based on how investment in DSP affects price outcomes for energy services compared to investment in traditional supply options – minimising the total costs of energy services paid by consumers. Figure 3.1 shows DSP in relation to other options for efficiently balancing demand and supply in the NEM.

Figure 3.1 Efficient demand and supply balance



Note: DSP outcomes/options do not constitute an exhaustive list. Further outcomes to be defined by work and stakeholder responses

The diagram shows relatively simplistically the inputs into the demand/supply balance in the electricity market. Consumers will choose how much power they wish to consume, based on their derived demand for other goods and services. This demand will initially be met by traditional generation – using the network to transport the power – and by distributed generation where it is economic. Where the cost of the power is more than the value consumers place on it, they may respond by reducing or shifting their consumption. Due to transaction costs and some of the characteristics of electricity (e.g. the need to continuously balance supply and demand), intermediaries such as retailers and aggregators can provide efficiencies by facilitating the interaction of the demand and supply sides of the market.

3.4 Assessment process

The assessment process will seek to:

- Identify plausible DSP options for the electricity market (e.g. load shifting, energy conservation, energy efficiency, load aggregation and distributed generation);
- Identify market conditions which will facilitate those DSP options (e.g. information, technology, pricing, organisation capability and culture);
- Identify the market and regulatory arrangements required to support the necessary market conditions (e.g. appropriate regulations, rules and incentives,

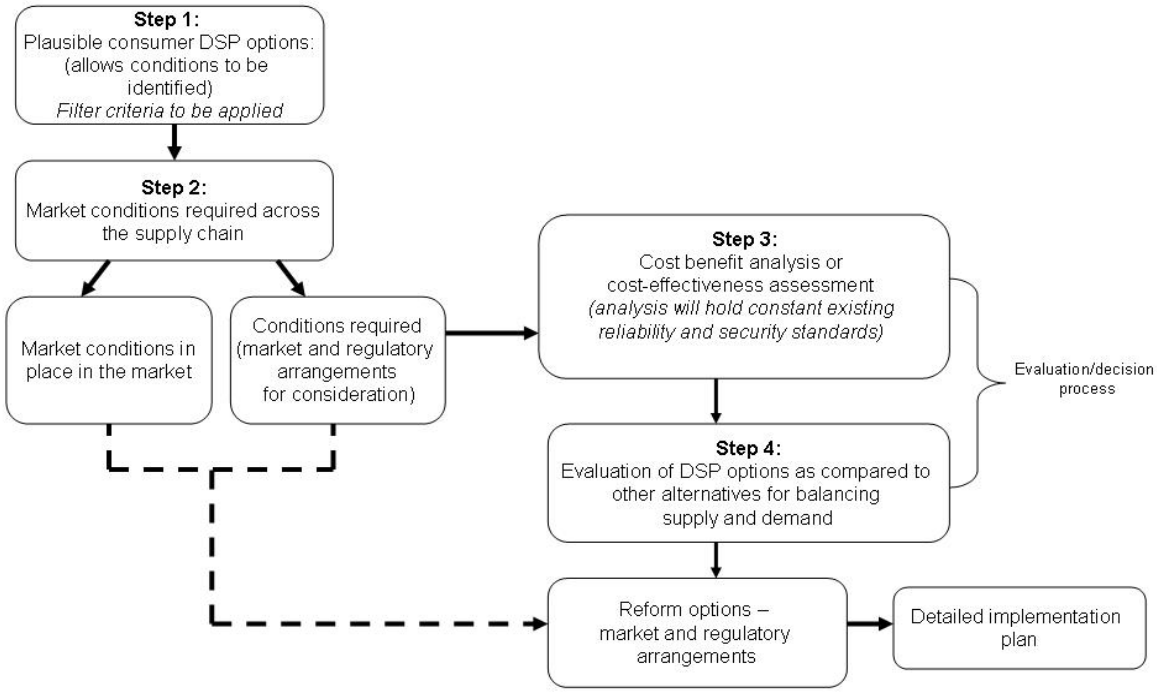
information provision, customer protection and privacy arrangements). These arrangements do not necessarily have to be energy market provisions and may require other measures such as standards (e.g. appliance and building) or government policy initiatives;

- Assess the costs of and potential benefits of establishing the market and regulatory arrangements required for different DSP options (e.g. $/MWh peak load reduction versus $/MWh supply, or comparative cost effectiveness assessment, e.g. cost/subsidy of $/MWh of energy saved for programs); and

- Recommend a desired range of market and regulatory arrangements and develop an implementation plan.

Assessment of how to achieve efficient market conditions may include considering various combinations of market and regulatory arrangements. This will take into account assessing which participants are best placed to implement the arrangements and will consider aligning incentives so that the whole electricity supply chain is geared to delivering products and services that assist consumers in making choices as to the quantity and timing of electricity use. The framework involves assessing the costs and benefits of achieving market conditions to support DSP options. Any recommendation arising from this assessment will be technology neutral. The response itself and its timing would ultimately be based on the consumers' and other participants' assessment of benefits they could achieve.

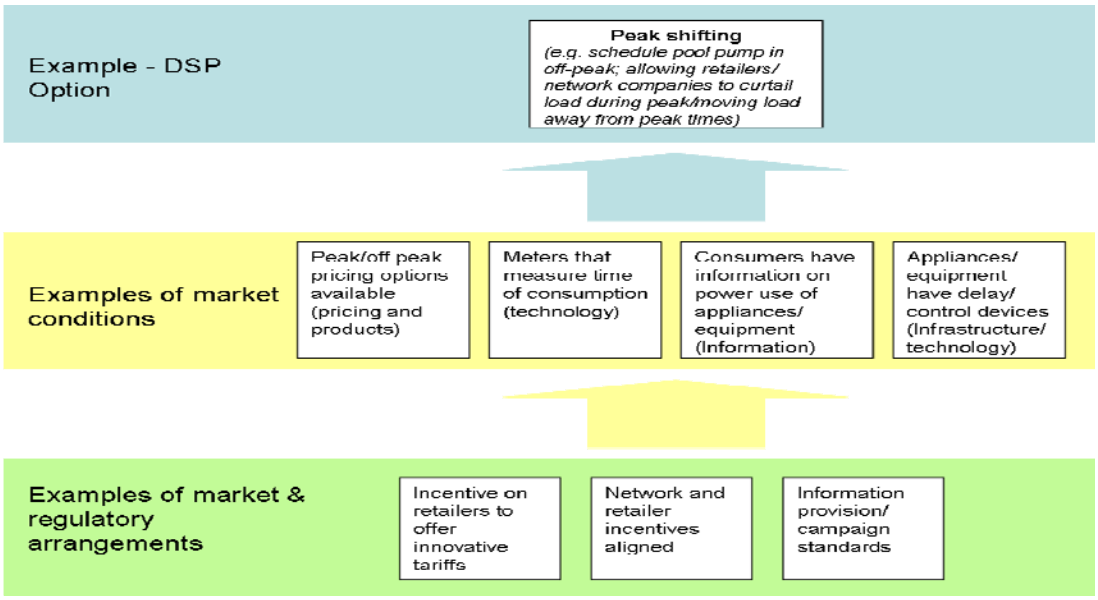
The following diagram summarises the steps of the assessment process.



3.4.1 Example: Peak shifting

In order to demonstrate the distinction between the three categories of market features (DSP options, market conditions and market and regulatory arrangements), each of the next three chapters builds up the following example of one DSP option (peak shifting). This example is designed to show examples of the types of market features that would be considered under each of the three categories.[36]

Figure 3.2 Example of DSP option - peak shifting



3.4.2 Cost-benefit analysis

The focus of our assessment approach and methodology will be on the costs and benefits of establishing the necessary market conditions. This is because:

- The major costs are likely to be linked with the establishment of market conditions (to the extent they are not currently in place), as any recommendations could potentially create conditions where expenditure on major investments such as technology, systems, information campaigns is undertaken; and
- While the main benefits will be seen at the level of the DSP options, since it is achieving an efficient level of consumption that will create the savings in terms of efficient expenditure in electricity infrastructure, it is the establishment of appropriate market conditions that will determine the potential volume of demand reduction/management that is possible.

36 The example is not intended to constitute an exhaustive list of all market conditions that are required for peak shifting, nor all market and regulatory arrangements that are required to establish those market conditions.

Rather than try to measure the benefit brought about by each individual market condition, it will be important to assess their benefits when they are in place in conjunction with other, complementary conditions. For example, the benefit of having smart meters in every home is likely to be minimal unless combined with other market conditions such as time of use tariffs and consumer information.

Measurement and quantification of expected benefits will present a number of challenges. A substantial amount of published work is available looking at many of the areas that will be considered under this review. This review will attempt to incorporate rather than duplicate that work, although we recognise that there are risks in comparing existing studies, which are based on diverse approaches. In some cases, the assessment of benefits may need to be largely qualitative.

Whilst the aim of the review is to facilitate choices for consumers in their electricity consumption, in order to assess whether the benefits of particular market conditions outweigh the costs of establishing them, estimates will be needed of the magnitude of response that is expected to occur as a result of those conditions, and the consequent effect on future investment requirements. This will largely be based on existing studies and surveys of how electricity demand (at an aggregated level) varies in response to changes in prices, information, technology etc.

Where quantification of costs and benefits is possible, the choice of discount rates will be important given the long-term nature of DSP benefits. A number of potential market conditions will involve significant capital investments, with benefits over a number of years, and different parties will apply different discount rates to their investments. We propose to undertake assessments using a reasonable range of discount rates based on a review of relevant literature/studies. We would welcome views on the most appropriate discount rates to apply to different parties across the supply chain

The NEM is an energy-only market (as opposed to a capacity market) where wholesale market costs are determined on a $/MWh basis. Thus, evaluating an efficient demand/supply balance requires assessment of the relative costs of meeting demand in terms of $/MWh through DSP compared to through supply side options, whilst also noting any other benefits that DSP may deliver. However, quantification of costs and benefits is likely to involve measuring investment in capital as well as volume of energy delivered/saved, so quantifying costs of capacity ($/MW) will also be relevant.

Other considerations

Under the MCE ToR's, we are required to consider and assess energy efficiency measures and policies that impact on or seek to integrate with the NEM. Therefore, in addition to the NEO test outlined above, we will assess those energy efficiency measures and policies in terms of their cost effectiveness in achieving their program or policy objectives. For example, if considering retailer energy efficiency obligation schemes, assessment may be in terms of cost or subsidy per MWh electricity saved or per tonne of carbon dioxide equivalent (CO_2-e) abated.

Consideration of energy efficiency policies and programs will also be given to the principles that should underpin more efficient alternatives to current programs to,

where possible, improve the efficiency of program outcomes. Such considerations may include framework, coverage, participation, incentives, and funding.

We will also where appropriate include the impact of any carbon price in the assessment of energy efficiency schemes, other DSP options and market conditions. To the extent there is uncertainty about the imposition or the level of a carbon price at the time the assessment is undertaken, we will use a range of reasonable scenarios.

3.4.3 Information and evidence

The AEMC is seeking a range of information and analyses to be undertaken across a number of key areas of the Review. This will help to inform our understanding of the suite of market conditions that may be needed to facilitate the efficient development, operation and use of DSP in the NEM. The areas where information and analysis will be sought include:

- drivers for DSP responses;
- plausible and foreseeable DSP options, informed by available evidence, consumer response and pilots and trials;
- efficient price signals to consumers;
- stocktake and review of energy efficiency policies and programs that impact or seek to integrate with the NEM; and
- services enabled by smart grid technology (completed Services enabled by Smart Grid Technology - KEMA Final Report[37]).

Questions Methodology and assessment

1. **Chapter 3 outlines our approach to identifying "market and regulatory arrangements that enable the participation of both supply and demand side options in achieving an economically efficient demand/supply balance in the electricity market." Do you agree with our approach?**
2. **How should the benefits of DSP be measured? Can they be accurately quantified?**
3. **What are appropriate discount rates to apply to DSP investments for the various parties across the supply chain?**
4. **Are there other issues which we should consider in our assessment process and criteria?**

37 www.aemc.gov.au

4 Consumer participation and DSP opportunities

4.1 Introduction

As discussed in Chapter 2, cost effective DSP can deliver a range of benefits, such as helping to reduce or defer the need for more investments in electricity network infrastructure, mitigating the impact of rising electricity prices and improving reliability and security of electricity supply. In order to realise the benefits that cost effective DSP may deliver, it will be necessary to provide consumers with greater opportunities to make informed choices about the way they use electricity. It will also be necessary to ensure the value that flexible demand offers is captured across the electricity supply chain.[38]

4.2 Consumer participation

To date, there has been some evidence of take up of DSP in the NEM,[39] although as consumers have tended to be passive participants in the electricity market, both the availability and uptake of DSP opportunities has been relatively low. A number of factors which have been highlighted as reasons for low consumer participation have included:

- electricity spend being a relatively small proportion of total household or businesses costs (i.e. management of electricity consumption has necessarily in past as a priority);
- presence of regulated retail prices;
- variation in the ability of different parts of the supply chain to access capital;
- lack of information on potential benefits from taking up DSP opportunities;
- limited technical capability (e.g. measurement of energy consumption); and
- lifestyle and behavioural factors.

Consumer interest and willingness to take up cost effective DSP opportunities will depend on their view of the value, preferences and benefit provided to them. In recent years, national electricity prices have increased approximately 32 per cent in real terms,[40] and are forecast to increase further by approximately 30 percent to 2012-13.[41]

38 AEMC 2011, *Strategic Priorities for Energy Market Development*, Discussion Paper, 1 April 2011.

39 AEMC 2009, *Review of Demand Side Participation in the NEM* Final Report to MCE, 27 November 2009, pp.5-6.

40 ABS, 2010c, Consumer Price Index, Australia, Dec 2010, cat. no. 6401.1, Australia Bureau of Statistics, Canberra.

41 AEMC 2010, *Future Possible Retail Electricity Price Movements: 1 July 2010 to 30 June 2013* Final Report to MCE, 30 November 2010.

As electricity prices increase and become a greater proportion of household, business expenditure and income, consumers are likely to consider more innovative ways to manage electricity consumption more efficiently. Prices and income play a significant role in determining consumption decisions, however we recognise that there are other factors that also play an important role such as behaviour, lifestyle, and the size and make up of households.[42]

In order to manage their electricity costs, consumers have the choice to take up DSP opportunities if they see value in doing so. For example, householders may choose to directly modify their consumption patterns or enter into a contract with a retailer or other party (e.g. networks/aggregators) to reduce their load during peak periods.[43] Commercial businesses may choose to take up energy efficiency opportunities such as engaging an energy service company to provide energy audits across business operations or consider investing and upgrading existing systems and equipment[44]. Industrial facilities that consume larger amounts of electricity may be motivated to self-manage their wholesale electricity costs by reducing consumption at times of very high wholesale prices (e.g. through entering into a contract which provides exposure to variations in wholesale electricity spot prices). There are likely to be significant costs involved in undertaking such activity (and therefore likely to be an uneconomic option for all but the largest companies) however, there are examples of such effective cost savings strategies. For example, in 2008, Adelaide Brighton Ltd estimated that its self-management of electricity cost risk had led to savings of over 35 per cent in its electricity costs since 2001 compared to the lowest-cost retail contracts it found available.[45] Boral's Berrima Cement works also seek to manage consumption when possible for some of their processes. For example, plant operators may program the hours of cement milling each day based on the time of use tariff structure[46]the cement consumption rate, the cement milling rate and the product available in storage. The operators have detailed real time energy consumption data available via their control system displays, if required, and have a decision matrix to simplify their decision making process.

While consumer participation will be important to achieve efficient DSP outcomes in the market, other parties will also need to have a strong interest in capturing the value of flexible demand and have a role in sharing that value with consumers. For example, retailers may consider DSP as an alternative means of hedging wholesale electricity

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42 AEMC Power of Choice Review, Stakeholder Reference Group, First Meeting 8 June 2011. Outcomes of the first meeting are provided at www.aemc.gov.au. ABS, 2008, Environmental Issues: Energy Use and Conservation, Mar 2008 cat. no 4602.0, Australia Bureau of Statistics, Canberra.

43 AEMC 2009, Review of Demand Side Participation in the NEM Final Report to MCE, 27 November 2009, p.4.

44 See Australian Government Energy Efficiency Opportunities Program Best Practice Case Studies at http://www.ret.gov.au/energy/efficiency/eeo/resmaterial/casestudies/Pages/default.aspx

45 AEMC 2009, Review of Demand Side Participation in the NEM Final Report to MCE, 27 November 2009, p.4.

46 Boral's Berrima Cement works is in Endeavour Energy's (formerly Integral Energy's) electricity network region. Endeavour Energy has a time of use demand tariff that relates to customer demands registered between the hours of 1pm - 8pm weekdays.

market spot price volatility (i.e. contracting with consumers to reduce load when prices are high). Network businesses may contract with a DSP provider as an alternative to network investment. DSP may also represent a valuable service to the system by enhancing the range of options available (e.g. as a means of avoiding involuntary load shedding) which in turn is likely to reduce costs.

4.3 Existing and future DSP options

There is a range of actions that consumers - or intermediaries acting as agents of consumers - can undertake. As noted, DSP actions are likely to vary across consumer sectors, i.e. the residential, small to medium business and the commercial and industrial sectors. Consumer actions can include householders replacing household fixtures and investing in wall and ceiling insulation, industrial facilities may choose to shift electricity consumption away from peak periods, while commercial facilities may seek to install embedded generators or retrofit buildings. These, and a range of other existing DSP options are provided in Box 4.1. The examples provided are not intended to be an exhaustive list of all DSP options available, but rather are provided to facilitate stakeholder feedback and submissions. It is likely that there are a range of other options available to consumers and other parties, particularly as advancements in technology and communications are progressed.

Continuing the example from Chapter 3, Figure 4.1 provides the example of the DSP option - peak shifting. Chapter 5 discusses the market conditions that may be needed. Chapter 6 discusses the potential market and regulatory arrangements that would facilitate and promote those market conditions.

Box 4.1: Examples of DSP options

Energy conservation - actions to reduce energy consumption. Examples of such measures include heating a room less in winter, using electronic equipment less, or enabling energy saving modes on a computer.

Energy efficiency - actions which use the same amount of energy to produce increased outcomes, or use less energy to produce the same outcomes. Examples may include installing home insulation, investing in more energy efficient appliances and/or improving appliance/building standards.

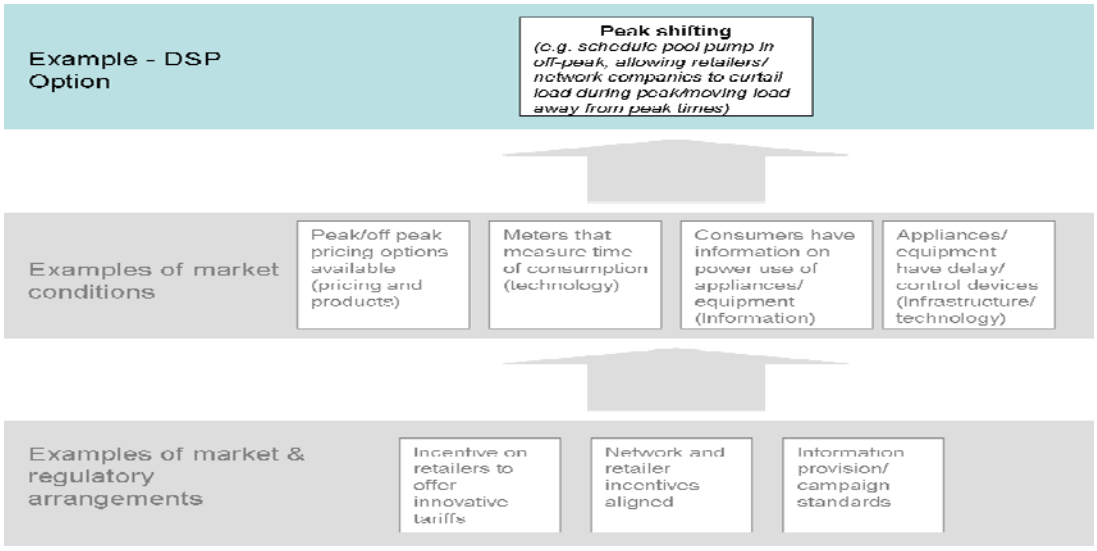
Peak demand shifting - actions where electricity demand is moved away from peak demand periods. Examples of peak demand shifting can include increased industrial production at night, and/or turning on washing machines, dishwashers, water pumps outside peak periods.

Fuel substitution - actions where consumers change type of fuel source, for example switching from electricity to gas cooking and heating, or use of solar thermal.

Generation of own energy - actions where consumers generate own energy needs, for example installation of embedded generation, standby power, or use of energy storage.

Selling energy or load back to the market - actions where consumers agree to provide energy or load back to the market. For example load bidding, ancillary services, co-generation.

Figure 4.1 Example of DSP option - peak shifting



Questions Consumer participation and DSP opportunities

5. **What are considered the drivers behind why consumers may choose to change their electricity consumption patterns? Please provide examples or evidence where appropriate.**

6. **Chapter 4 lists some plausible DSP options that are currently used or could be used by consumers. Are there any other plausible DSP options currently used by consumers that have not been identified? Please provide description of measures and examples, where available.**

7. **Are there DSP options that are currently available to consumers, but are not commonly used? If so, what are they, and why are they not commonly used (i.e. what are the barriers to their uptake)? Please provide examples and evidence if available.**

8. **Are there other DSP options that are not currently available to consumers, but could be available if currently available technologies, processes or information were employed (or employed more effectively) in the electricity (or a related) market?**

5 Market conditions required for efficient DSP outcomes

5.1 Introduction

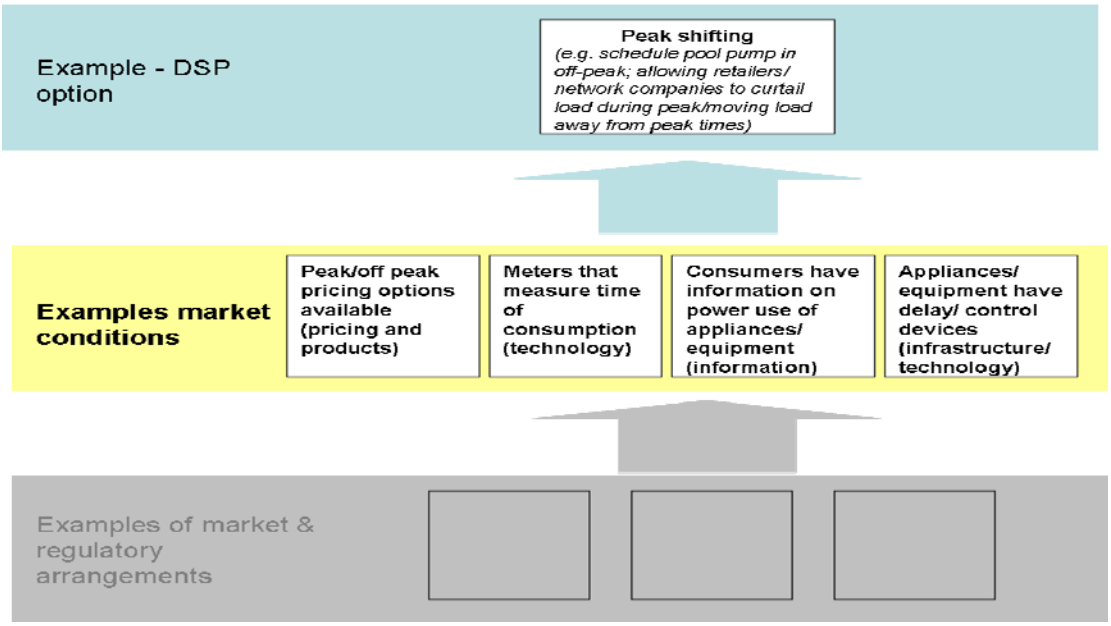
In order for consumers to make informed choices regarding their electricity use and hence take up DSP options, there are likely to be a range of conditions[47] which need to be in place. This chapter discusses some of those market conditions and the likely incentives needed for other parties to capture the value of flexible demand.

5.2 Market conditions and areas for investigation

Chapter 3 outlined that there are three necessary features for consumers to be able to interact efficiently in the market; that is, consumers require an incentive, ability and willingness to adjust their consumption patterns. For the conditions described below, we have sought to relate each of the conditions identified to the one of those relevant features.

To illustrate, Figure 5.1 provides the example of a DSP option - peak shifting - and presents some conditions that may be required to facilitate consumer decision making and take up of that DSP option. We discuss each of the conditions and key areas for investigation for the review in more detail below. The range of conditions discussed is not considered an exhaustive list and have been provided to encourage stakeholder feedback and input into the review.

Figure 5.1 Example of DSP option – peak shifting



47 Market conditions are referred to as the features which need to be present in the electricity market to enable all participants in that market to make and implement informed decisions, while recognising that it is the consumer who makes the final consumption decision

Questions Market conditions required for efficient DSP outcomes

9. What are considered the relevant market conditions to facilitate and promote consumer take up of cost effective DSP?

10. Are there any specific market conditions which may need to be in place to enable third parties to facilitate consumer decision making and capture the value of flexible demand? Please provide examples and evidence as appropriate.

11. What market conditions (technologies, processes, tariff structures, information etc) are needed, that are not currently employed in the electricity market, to make other DSP options available to consumers?

5.2.1 Consumer incentives to respond - pricing

Retail electricity prices influence consumer end use and investment decisions. For example, consumers may choose to use less, more, or not use electricity at all at certain times. Consumers may also choose to invest in more energy efficient appliances and equipment. If electricity prices are reflective of the value of available resources (i.e. generation and network capacity), they will provide consumers with the greatest benefit from reducing their consumption at times when the availability of resources is constrained. Hence, efficient price signals improve overall economic efficiency of the electricity market, increase reliability and security of supply and provide for lower long term electricity costs for consumers.

As part of the Review we will consider and assess the operation of efficient price signals in the NEM. Specifically, the potential for efficient operation of price signals to promote efficient consumer DSP through enhancing consumers' ability to make informed choices concerning their use of electricity services, including timing and quantity of their electricity consumption. Considerations are to include, but are not limited to:

- the level of incentives for, and any limitations to, retailers reflecting efficient price signals in customer tariff structures;
- alignment of incentives between the participants in the electricity supply chain to facilitate cost-reflective prices;
- the potential for increased retail competition to enhance the provision and operation of efficient price signals;
- the potential for smart meter, smart grid and load control technologies to enhance the provision and operation of efficient price signals (both directly or by facilitating the entry of new market participants);

- the incentives for, and ability of, different customer groups to adjust their demand patterns in response to a price signal; and

- any issues related to the availability and usefulness to consumers of other information which would facilitate a response to price signals, or otherwise enhance the transparency or communication of DSP opportunities.

Current retail pricing

As discussed, efficient price signals are a necessary (but not sufficient) requirement for efficient consumer decision making, given that they provide appropriate incentives for consumers to adjust their consumption patterns. Currently, in the NEM, retail prices or tariffs for residential or small business customers are regulated.[48] Regulated retail tariffs are generally based on revenue or pricing controls and comprise of the following cost components:

- energy purchase costs (the cost for retailers purchasing electricity from generators);

- network costs (for transmission and distribution networks, which are typically passed through);

- retail operating costs (for example, customer acquisition and retention costs); and

- retail margin (the return for the risk the retailer adopts for doing business).

The presence of retail price regulation can inhibit consumers (i.e. residential and small to medium business consumers) from making informed choices about their electricity uses. This is because prices may not necessarily provide signals of the higher costs of supplying electricity at certain times. Currently, most electricity consumers pay flat electricity tariffs, that is, these consumers pay the same price for each unit of electricity they consume no matter what time of day or year. This does not reflect the variations in cost of wholesale electricity, and the constraints at peak on the network.

Pricing structures that reflect the wholesale cost of electricity, that provide diverse pricing options and provide consumers with the opportunity to reflect their own value preferences are likely to be important in facilitating and promoting consumer take up of DSP opportunities. We note some of the review's Stakeholder Reference Group observations that, while prices need to better reflect the costs of electricity supply, support for those consumer groups who are particularly vulnerable to price increases (e.g. low income households) is required.[49] Specifically, pricing structures need to be

48 The exception is in Victoria where there are no price controls on the setting of retail tariffs because retail competition in the Victorian electricity market was found to be effective. Victoria has moved to a price monitoring regime. For further information, refer to: http://www.aemc.gov.au/Market-Reviews/Completed/Review-of-the-Effectiveness-of-Competition-in-the-Electricity-and-Gas-Retail-Markets-Victoria.html.

49 AEMC, Power of Choice review, Stakeholder Reference Group First Meeting, 8 June 2011. Outcomes of the first meeting are provided at www.aemc.gov.au.

sufficiently flexible so as to ensure that vulnerable consumer groups are not unduly disadvantaged and support mechanisms such as the National Energy Customer Framework[50] are in place.

Questions Pricing

12. Do you consider retail tariffs currently reflect the costs to a retailer of supplying consumers with electricity?

13. Are any changes needed to retail price regulation to facilitate and promote take up of DSP?

14. Do the charges to retailers for use of transmission networks reflect the value of that use?

15. Do the charges to retailers for use of distribution networks reflect the value of that use?

16. Do all consumer groups, including vulnerable consumers benefit from having cost reflective prices in place? If not, are any special provisions required to protect certain classes of consumers?

5.2.2 Consumer willingness to respond

Provision of information

Active participation of the demand side is more likely to occur when consumers have sufficient information about the available opportunities, technologies, and services which assist to make choices that will maximise their welfare. The provision of information and education also increases consumer's understanding of the impacts of their electricity consumption on their bills and on costs of electricity supply.

When consumers are unable to access necessary information, or the information which is available is perceived to be complex and costly to decipher, there is a risk that consumers (or specific groups of consumers) are not sufficiently well-informed. Consequently, consumers may make inefficient decisions.[51]

50 http://www.ret.gov.au/Documents/mce/emr/rpwg/default.html

51 Note consumers, even when provided with relevant and sufficient information, may neglect opportunities because of information overload or other cultural/behavioural factors (e.g. time, resources, ability to process information energy costs not large enough to be a concern).

There are a range of factors which may result in consumers being inadequately informed or unable to access necessary information to make efficient consumption decisions. These factors may include:

- consumer lack of interest and awareness regarding electricity consumption and impact on costs of electricity supply. For example, currently a consumers' decision to consume electricity is separated from the costs of making that choice as consumers typically receive their bills some time after their consumption decision has been made. This is unlike other commodities such as food or petrol where consumers know how much it will cost them to purchase an item or drive a certain distance.
- obtaining appropriate and relevant information is perceived to be costly and complex – this includes both financial and opportunity costs of devoting time and effort that may be required;
- information is not always available to all participants in the market (i.e. some participants in the market may have more information than others or parties may not have sufficient information about consumer preferences);
- lack of robust and relevant information regarding cost and benefits of demand side options available in the market; and
- lack of ability by parties to provide real time information regarding cost of electricity supply (with the exception of very large businesses). For example, due to technology limitations such as metering and/or billing systems.

There are a range of policies and programs that have sought to address existing information and behavioural barriers and to encourage consumers to use energy more efficiently, for example appliance rating schemes, minimum energy performance standards, bill benchmarking and home energy audit programs. Although these and other programs are in place, there is likely to be significant scope for improvement in the availability of accurate, accessible and useful information to facilitate and promote consumer choice and decision making.

Questions	Information
17.	**To what extent do consumers understand the how they can reduce their electricity bill? What information do consumers need in order to increase their understanding of how they can reduce and manage their electricity consumption and hence bills?**
18.	**What issues are associated with provision of existing information in the market? Are there arrangements that could improve delivery of such information? If so, how and by whom?**
19.	**Could better information be provided to consumers on the actual consumption of individual appliances and pieces of equipment? If so, what information could be provided and in what form?**

Pricing options, products and consumer incentives

Different pricing options, products and incentives are likely to motivate consumer decision making in relation to managing their electricity consumption. Consumers are also motivated by different drivers, for example, lower costs of a product, the way in which a benefit is packaged, or by environmental objectives. Such differences are likely to therefore affect their potential response (e.g. a fifty dollar cheque or voucher for goods may be more attractive to some consumers than an electricity bill that is fifty dollars lower).

As electricity supply costs increase, there are improvements in the availability of data and information and consumers become more aware of their consumption (particularly in response to higher bills), retailers, networks and other parties may need to consider more innovative end pricing approaches including products and incentive offers. Issues for consideration in the delivery of effective pricing options, products and consumer incentives are likely to include:

- ability of business service models to consider DSP opportunities (e.g. offering information about electricity costs or energy efficiency as a mechanism to attract or keep customers);
- alignment of incentives between parties (such as retailers, network businesses and other parties). That is whether the benefits of investment in demand side options are captured in the value of the asset and whether incentives are split between parties;
- ability to obtain access to consumers and their information (i.e. consumption data) and costs of appropriate systems (i.e. billing requirements/ability to control loads);
- incentives to develop innovative commercial products (pricing offers, rebates, vouchers (e.g. bonus frequent flyer points etc));
- ability to develop innovative commercial contracts – appliance switching rights/customer protection/safety;
- existing frameworks for network regulation, for example, revenue regulation as compared to price regulation; or jurisdictional standards for reliability;
- whether prices and price setting process reflect costs or unduly impact on DSP, such as energy (KWh) tariffs as compared to capacity (kW or KVA) tariffs.

Questions Pricing options, products and consumer incentives

20. Are retailer and distributor business models supportive of DSP?

21. What incentives are likely to encourage research and development of other parties to promote efficient DSP?

22. Are there any regulatory, cultural or organisational barriers that affect take up of DSP opportunities?

23. What form of commercial contracts/clauses are required for facilitating and promoting efficient DSP?

5.2.3 Consumer ability to respond

Incentives to invest and access to capital

In order for consumers to adjust their electricity demand, it is important that they (or their agent) have access to the infrastructure that physically allows them to make short and long term changes in electricity consumption. This will allow for DSP to be available to consumers. Lack of access to infrastructure may result in consumers not considering DSP or prevent consumers from changing their consumption even if they are willing take up a DSP opportunity.

Investment in the relevant infrastructure is therefore an important requirement for enabling efficient DSP. However, incentives may not be sufficiently aligned across various parties for efficient investment to take place. This issue may be described as one involving split incentives, that is, the benefits may be dispersed across a range of parties, such that the rewards to any individual party are insufficient to justify the making of that investment.

The landlord/tenant problem in residential and commercial buildings is a commonly cited example of a split incentive. Landlords generally do not have strong incentives to install more energy-efficient fixtures/appliances because they do not pay the energy bills, therefore they do not gain the benefit of lower bills from the investment. In most cases, they might not be able to recoup the additional capital costs through increased rent. Tenants on the other hand might be prohibited from replacing fixtures and appliances, or might not be confident that they will be able to recoup the savings (through lower energy bills), when the term of their lease is short or uncertain.

A broader illustration of the issue of split incentives in the electricity supply chain occurs where a distribution business, for example undertakes an investment, but the benefits may be largely accrued by distributed generation or retailers.

In a perfect market, this issue of split incentives could be addressed through various parties being able to strike contracts which enable the risks and benefits of an investment to be appropriately shared. In practice, however, the existence of transaction costs and imperfect information may prevent the striking of such contracts, so that efficient investments may not go ahead.

Another important consideration is access to capital. Where the upfront costs of investing in goods or technologies that enhance energy efficiency or the ability of consumers to change their consumption in the short term are high, access to capital may be required for an investment to be made. Different parties across the supply chain may have varying degrees of access to capital, which may distort the extent to which efficient investments are made. Access to capital will also be affected by macroeconomic conditions and the level of competition in the finance sector.

Questions Incentives to invest and access to capital

24. Are there specific issues associated with investment in infrastructure that is needed for consumers to take up DSP opportunities?

25. Do you consider that the issue of split or misaligned incentives has prevented efficient investment in DSP from taking place?

26. What are potential measures for addressing any issues associated with split or misaligned incentives?

27. What are the specific issues concerning ease of access to capital for consumers and other parties?

Technology and system capability

Technology and system capability are potential market conditions that provide consumers with the ability to undertake DSP by allowing consumers to adjust their electricity consumption. The evolution of technologies such as "smart grids"[52]and two-way communication systems between consumers and suppliers may increase prospects for DSP, particularly as metering and communications technology will enable information to be exchanged.

As part of the review, we are required to assess energy market frameworks that would maximise the economic value to consumers of services enabled by smart grid/smart meter technologies, including load control technologies. The review is to consider the following matters:

52 There are a wide variety of innovations that constitute smart grid technology.

- enabling effective interaction between competitive and regulated services;
- regulating access to infrastructure, data and customers;
- encouraging efficient investment in new technology and services;
- enabling more sophisticated price signals to be passed through to customers; and
- ensuring the rights and interests of customers are protected.

Smart grid technologies, including smart meter and load control technologies, are likely to provide services that enhance consumer participation. Further, these technologies may facilitate more effective operation of electricity utilities in meeting standards relating to reliability and system security.

In order to optimise the value to consumers of services enabled by technologies such as smart grid/smart meter and load control capability, there are various challenges that need to be addressed. Some of these key challenges are discussed below:

- The need to ensure that the benefits of smart grid technologies are accrued across the electricity supply chain and ultimately benefit consumers. The issues related to split and misaligned incentives described in the previous section ("Incentives to invest and access to capital") may be of particular relevance to investments in smart grid and other technologies, where the investments required are substantial, but the benefits accrue to a number of parties across the supply chain.
- The need to ensure that there are complementary price signals or tariff arrangements faced by consumers. It will be necessary to provide efficient DSP signals, and consequently enable consumers to make optimal use of technologies such as smart grids. This is a key area for investigation in the review (i.e. efficient operation of price signals).
- Promoting efficient investment in new technologies and services in the face of technological risk, particularly where technologies may not be mature or where technologies may become obsolete.
- The use of smart grid technologies to facilitate efficient DSP inevitably raises issues relating to the appropriate regulation of access to data, infrastructure and customers, particularly where there are multiple parties seeking access, with some parties seeking exclusive access for commercial reasons.
- Consumer protection, including the privacy and security of data in an environment where smart grid technologies could potentially place consumers at risk of breaches of privacy and a reduced level of consumer protection. This challenge is related to the challenge regarding access to data, infrastructure and customers.

Questions Technology and system capability

28. What are the significant energy market challenges in optimising the value of technology and system capability to facilitate an efficient level of DSP?

29. Do current technology, metering and control devices support DSP? If not, why not, and what are considered some of the issues?

30. How can issues relating to weak and/or split incentives be addressed to ensure that the benefits of smart grid technologies are aligned and felt across the electricity supply chain, including by consumers?

31. How can pricing signals/tariff arrangements be made complementary with smart grid technologies to facilitate efficient DSP in the NEM?

32. In maximising the value of technologies, such as smart grids for DSP, what are the issues relating to consumer protection and privacy?

6 Market and regulatory arrangements required to facilitate an efficient demand-supply balance

The previous chapters describe the types of DSP options that are or could be undertaken by consumers, and some of the market conditions that may need to be in place in order to facilitate those options. Where those market conditions are not currently in place, the review will consider the reasons, and whether changes are required to the ways in which participants in the electricity market are regulated or incentivised in order to help bring forward those market conditions.

Market and regulatory arrangements are the legislation, regulations and incentives which help to achieve the necessary market conditions by influencing the behaviour and informing the choices of parties (including consumers) who participate in the electricity market. Any changes that are recommended as a result of this review will be to the market and regulatory arrangements – with the aim of bringing about changes in the market conditions.

The key focus of this Issues Paper is on identifying the range of DSP options that are or may be available to consumers, and the market conditions that need to be in place to facilitate those options. Once we have formulated an initial picture of what cost-effective DSP options might be available to consumers, and the corresponding market conditions that might be needed (including any issues associated with these DSP options or market conditions), the review will turn to considering what market and regulatory arrangements might be required in order to promote those market conditions. Whilst we are seeking initial views on the market and regulatory arrangements in this Issues Paper, the Directions Paper (to be published in November) will consult in more detail on this aspect.

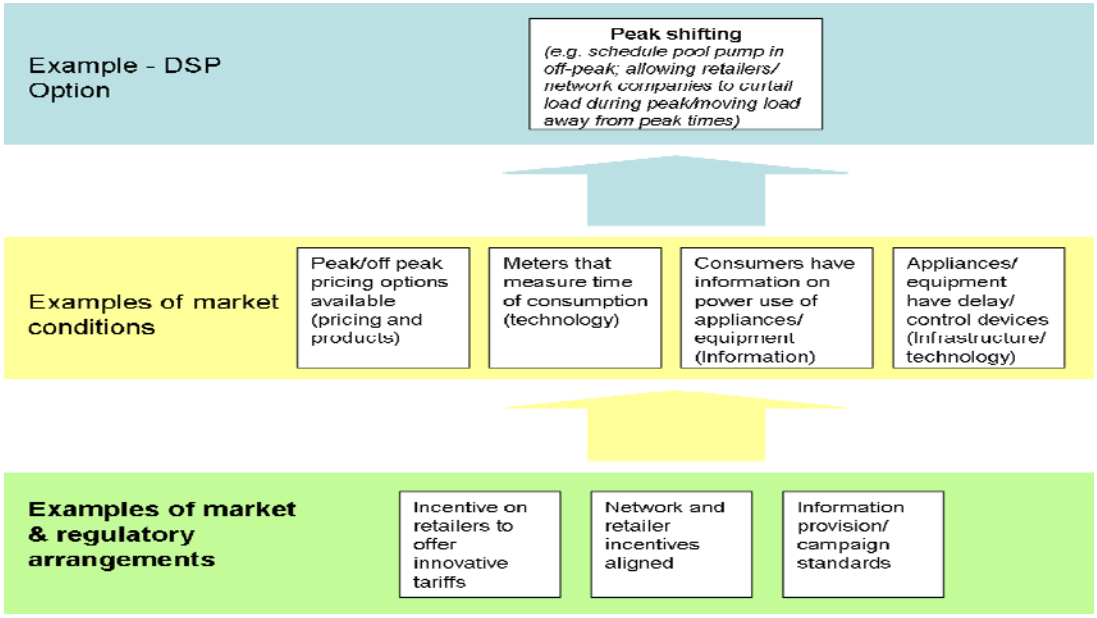
We would welcome any directional views on any issues with the current market and regulatory arrangements which mean they do not promote efficient levels of DSP. Where possible it would be useful if submissions could be as specific as possible about any aspects of the market and regulatory arrangements that create issues or barriers for DSP, how they should be changed, and the specific market conditions that those changes would help to promote.

For example, peak shifting may be considered a useful DSP option, and one of the market conditions needed to facilitate that could be, for example, easily accessible consumer information on the most power-intensive domestic appliances. The review will need to investigate whether such a market condition is currently in place, and if not whether any changes to the market and regulatory arrangements could be made to promote that market condition. For example, are there any private companies who can obtain value from publishing the information? Should certain parties have an obligation to make it available? Is it better provided by government or other public bodies?

It is possible that one change at the level of market and regulatory arrangements could help to promote more than one market condition. For example, a change to the pricing

structures in the NEM in order to increase the rewards for long term innovative investments may provide incentives on retailers to introduce new tariffs and to educate consumers about the benefits of changing their consumption patterns.

Figure 6.1 Example of DSP option - peak shifting



Questions Market and regulatory arrangements

33. To what extent do parties have appropriate incentives to put in place the systems, technologies, information flows etc that facilitate efficient DSP?

34. Are there aspects of the NEL or the rules which prevent parties taking actions that would otherwise allow for more efficient levels of DSP?

35. Are there market failures which mean regulation is needed in some areas to ensure appropriate market conditions are in place?

7 Energy efficiency measures that integrate with or impact upon the NEM

7.1 Introduction

Energy efficiency is defined as using less energy to produce the same level of output or using the same amount of energy to deliver a higher level of output.[53] This Chapter discusses the ToR requirement for the review to consider specific energy efficiency policies. It also discusses the approach that we intend to take in considering these measures to promote DSP in the electricity market.

7.2 Energy efficiency measures and policies

The MCE has specifically requested that the AEMC assess the potential for energy efficiency measures to promote the efficient use of, and investment in, DSP in the stationary energy sector. The AEMC is to undertake a stocktake and analysis of regulatory arrangements for energy efficiency measures and policies that impact on or seek to integrate with the NEM, such as retailer obligation schemes. As part of this work, we are required to consider, the:

- potential of measures that place energy efficiency obligations on market participants, including generators, retailers and distributors to:
  - facilitate efficient consumer DSP and electricity use decisions;
  - recognise or reward efficient consumer DSP actions;
  - invest directly in energy efficiency opportunities; or
  - enhance the level and transparency of information identifying DSP opportunities.
- potential for market institutions to support efficient use of, and investment in, DSP through NEM infrastructure and systems, such as through market settlement systems and new smart metering/smart grid technologies;
- potential for costs and benefits of such measures for all market participants and institutions, and the extent to which these parties are better positioned to facilitate energy efficiency decisions than external third parties or users themselves;
- potential enforcement and compliance procedures that may be required if regulatory requirements and obligations are imposed on market participants; and

53 Prime Minister's Task Group on Energy Efficiency, Final Report 2010, p.27.

- potential of such measures to support the NEO, including quantitative assessments where appropriate.

The consideration of these measures arises from the MCE's requirements under the Council of Australian Governments' National Partnership Agreement on Energy Efficiency and the National Strategy on Energy Efficiency (NSEE). This agreement seeks to deliver a nationally consistent and co-operative approach to energy efficiency. The MCE considered that while energy efficiency policies are external to the rules, they may have the potential to impact on efficient DSP and electricity market outcomes and hence should be considered as part of this review.

Which energy efficiency policies and schemes will we assess?

There are number of energy efficiency schemes in place across the NEM regions. These are likely to in some way impact on the NEM, however the existing range of policies and programs are too numerous to all be assessed in detail. In order to narrow down the policies/schemes that impact on or seek to integrate with the NEM, we propose that the measures or policies for consideration in this review are those schemes that impose direct obligations or incentives on NEM participants (such as the existing retailer obligation schemes in place across some jurisdictions (i.e. Victoria, South Australia and New South Wales). There has been some work over recent years to review the existing energy efficiency policies or consider improving uptake of energy efficiency measures in Australia.[54] For example, in 2010, the Prime Minister's Task Group on Energy Efficiency delivered its Final Report which proposed a number of recommendations to deliver a step-change improvement in energy efficiency to 2020. The Task Group's Final Report made a number of specific recommendations including the introduction of a transitional national energy savings initiative to replace existing and planned state schemes.[55] The Australian Government has, as part of its Clean Energy Future announcement provided its response to the Task Group on Energy Efficiency Final Report. The Australian Government has indicated that it will undertake further work on a national energy savings initiative, expand the Energy Efficiency Opportunities program and improve the government's arrangements around energy efficiency[56]. As part of the review, we will take into account any outcomes of these and other relevant processes as necessary.

As discussed in Chapter 3, we will undertake the assessment of the specific energy efficiency policies as part of the overarching approach to assessing demand side options. Our considerations of the relevant policies will also be assessed in terms of their cost effectiveness in achieving their stated objectives, for example as a cost or subsidy per MWh electricity saved or per tonne of CO_2-e abated. The aim of this cost-effectiveness assessment is to identify the market conditions or market and regulatory

54 Grattan Institute, Learning the hard way: Australia's policies to reduce emissions, April 2011; Productivity Commission, Comparing carbon policies internationally: the challenges, 2011

55 http://www.climatechange.gov.au/en/publications/energy-efficiency/report-prime-ministers-taskforce-energy-efficiency.aspx

56 http://www.cleanenergyfuture.gov.au/clean-energy-future/securing-a-clean-energy-future/#content09

arrangements which represent the most cost-effective means of achieving objectives such as reductions in consumption and greenhouse gas emissions.

Questions Energy Efficiency measures and policies

36. What energy efficiency policies and schemes should be considered as part of this Review, i.e. as impacting on, or seeking to integrate with the NEM?

37. To what extent can energy efficiency policies and schemes be adopted as options for enhancing the efficiency of DSP in the NEM? What are the strengths and limitations of energy efficiency policies as a DSP option compared to other options?

38. To what extent do existing retailer obligation schemes facilitate efficient choices by consumers in their electricity use? Are there aspects of those schemes facilitate efficient consumption choices more than others? If so, please explain.

Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
COAG	Council of Australian Governments'
CO_2-e	carbon dioxide equivalent
DMIS	Demand Management Innovation Scheme
DSP	demand side participation
EBSS	Efficiency Benefits Sharing Scheme
ESCOs	energy service companies
NSW ESS	New South Wales Energy Saving Scheme
expanded RET	expanded Renewable Energy Target
IPART	Independent Pricing and Regulatory Tribunal
MCE	Ministerial Council on Energy
MW	megawatt
MWh	megawatt hour
NEM	National Electricity Market
NEO	National Electricity Objective
NSEE	National Strategy on Energy Efficiency
PJ	petajoules
RERT	Reliability and Emergency Reserve Trader
SA REES	South Australian Residential Energy Efficiency Scheme
SRG	Stakeholder Reference Group
Vic VEET	Victorian Energy Efficiency Scheme

A Reforms to date

A number of reforms have been introduced in the NEM that have sought to assist and enable parties to participate actively in the electricity market. These reforms act as a starting point for any further reforms needed to facilitate efficient DSP in the NEM. The reforms to date regarding DSP and the NEM include:

Reviews and Rule changes

November 2006 - National Electricity Amendment (Economic Regulation of Transmission Services) Rule (Chapter 6A).

The Rule introduced provision for AER to establish an Efficiency Benefit Sharing Scheme, with scope to share benefits from reducing or deferring operating and capital expenditure, including that arising from non-network alternatives.

November 2006 - National Electricity Amendment (Reform of the Regulatory Test Principles) Rule.

The Regulatory Test (Test) is part of the regulatory framework for assessing new network investment. The Test ensures that an assessment is conducted of new augmentation investment and alternative non-network options, to ensure that appropriate projects are justified and constructed. The Commission addressed concerns regarding the assessment of alternative options under the market benefits limb of the Regulatory Test (at the time) by putting in place a two stage process: first, requiring the Network Service Providers (NSPs) to publish a request for information on potential alternative options, and second, requiring that the Test should take the form of an assessment of the proposal against the likely alternative or alternatives, rather than an assessment against all genuine and practicable alternatives.

March 2007 – National Electricity Amendment (Technical Standards for Wind and other Generator Connections Rule).

This Rule implemented a number of significant market developments in relation to generator connection, particularly related to wind generators. The Commission balanced the need to remove unnecessary hurdles for new generator entry, in particular new generation technologies including wind, while ensuring that AEMO and the NSPs are able to maintain ongoing power system security and power quality.

April 2009 – National Electricity Amendment (Demand Management) Rule

This Rule requires:

- Transmission Network Service Providers (TNSPs) to provide specific information about forecast constraints where an estimated reduction in forecast load would defer a forecast constraint for a period of twelve months as part of their requirements for Annual Planning Reports (APRs);

- the Australian Energy Regulator (AER) to accept forecasts of network support payments made in a previous regulatory period that continue in the forthcoming regulatory control period. It is noted that network support payments include payments to generators as well as DSP options that are an alternative to network augmentation; and

- the AER, when assessing revenue proposals, to take account of the extent that the TNSPs have demonstrated, and made provision for, appropriate efficient non-network alternatives.

November 2009 - National Electricity Amendment (Confidentiality Provisions for Network Connections) Rule

This Rule clarifies that NSPs may disclose information in certain circumstances to Registered Participants and other persons to facilitate coordinated connection applications and enquiries.

July 2010 - National Electricity Amendment (Payments under Feed-in Schemes and Climate Change Funds) Rule

This Rule provides a cost recovery mechanism for distribution network service providers (DNSPs) for payments they make under feed-in tariff schemes and climate change funds where they are required to do so under government policies.

September 2010 - National Electricity Amendment (Aggregation on Ancillary Service Loads) Rule

This Rule removes the requirement (barrier) for market loads forming part of an aggregated ancillary services load to be classified as scheduled loads. Instead, Market Customers who wish to aggregate their relevant market loads for the purposes of central dispatch must apply to AEMO to do so. AEMO must approve applications for aggregation for relevant ancillary services loads as long as certain conditions relating to system security and reliability of supply are met.

September 2009 - Review of the National Framework for Electricity Distribution Network Planning and Expansion.

The Review has proposed recommendations to assist the establishment of a national framework for distribution network planning. The Review has also made a number of recommendations to better incorporate DSP within the planning process.

The Final Report was provided to the MCE on 30 September 2009. MCE responded to certain elements of the review but not on the proposal for a review of distribution reliability standards.

October 2009 - National Electricity Amendment (Improved RERT Flexibility and Short-notice Reserve Contracts).

The Rule change amends the Reliability and Emergency Reserve Trader (RERT) arrangements to provide a framework to implement changes to the operation of the

RERT to facilitate long-notice, medium-notice and short-notice reserve contracting. It also clarifies that AEMO can form a RERT panel and may use reserve contracts during system security events.

November 2009 - Review of Demand-Side Participation in the National Electricity Market

This review found that there were no material barriers in the rules for efficient demand-side participation, however a number of Rule changes and matters for further review were recommended.

The proposed Rule changes require:

- that operating expenditure for DSP by transmission businesses be excluded from the Efficiency Benefits Sharing Scheme (EBSS);
- that the existing Demand Management Innovation Scheme (DMIS) be extended to include the connection of embedded generators; and
- that the rules are amended to ensure that an embedded generator that is already receiving network support payments from a transmission business does not also receive avoided TUOS.

The MCE has submitted this as a Rule change proposal and it is under consideration by the AEMC.

The matters for further review included the investigation into regulatory and market arrangements to facilitate services enabled by new technologies, in particular smart grid technologies. The MCE endorsed the AEMC's recommendation and this forms part of the scope for this current review.

The AEMC also recommended:

- a review of minimum technical standards as part of the proposed Technical Standards Review. The technical standards are seen as significant issue limiting effective uptake of embedded generators.
- a review of distribution reliability standards. The MCE considered that decision regarding the proposed AEMC review of distribution reliability standards (i.e. whether the form of standards be derived on an economic basis, and if so, how) would best be made following MCE policy response to the Transmission Reliability Standards Review.
- that the AER consider inclusion of embedded generators to the DMIS when designing a national scheme and that the AER establish processes for the consideration and funding of DMIA proposals by businesses.

There are have been a number of programs and reforms external to electricity market that seek to improve energy efficiency and DSP participation by consumers. Some of these include:

Other Reforms

Council of Australian Government's *National Strategy on Energy Efficiency (NSEE)*

This Strategy seeks to deliver a nationally consistent and co-operative approach to energy efficiency.

Energy Efficiency Opportunities Program

The Energy Efficiency Opportunities Program[57] encourages large energy-using businesses to improve their energy efficiency. It does this by requiring businesses to identify, evaluate and report publicly on cost effective energy savings opportunities.

The program's requirements are set out in the Energy Efficiency Opportunities legislation, which came into effect on 1 July 2006. Industry guidelines and other program support material are also available to help large energy-using businesses understand their obligations.

Energy Efficiency Opportunities is designed to lead to:

- improved identification and uptake of cost-effective energy efficiency opportunities;
- improved productivity and reduced greenhouse gas emissions; and
- greater scrutiny of energy use by large energy consumers.

Participation in Energy Efficiency Opportunities is mandatory for corporations that use more than 0.5 petajoules (PJ) of energy per year. This is approximately equivalent to the energy used by 10,000 households. There are more than 220 corporations (incorporating around 1200 subsidiaries) registered for the Energy Efficiency Opportunities program.

As a guide to businesses, those using more than 0.5 PJ a year may typically have an annual energy bill of more than $3-4 million for gas, $6-11 million for electricity, or $18-21 million for diesel fuel, depending on fuel prices. Put another way, 0.5 PJ approximately equals 139,000 MWh, 13 ML diesel, 9000 tonnes of LNG or 10,000 tonnes of LPG.

The program applies to corporations in all sectors of the economy. Corporations that use more than 0.5 PJ of energy per year are collectively responsible for more than 60 per cent of the total amount of energy used by businesses, and around 45 per cent of all energy used in Australia.

Businesses participating in Energy Efficiency Opportunities are required to undertake a detailed energy assessment in order to identify opportunities to improve energy use, and to report publicly on the outcomes.

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57 Commonwealth Department of Resources, Energy and Tourism website at 090611 http://www.ret.gov.au/energy/efficiency/eeo/about/Pages/default.aspx

National Australian Built Environment Rating System (NABERS)[58]

A national initiative, NABERS is a performance-based rating system for existing buildings. NABERS rates a building on the basis of its measured operational impacts on the environment, and provides a simple indication of how well you are managing these environmental impacts compared with your peers and neighbours.

NABERS rates the environmental performance of existing buildings on 1-5 star scale. A five star rating represents best practice environmental performance, while a one-star rating indicates below average performance and opportunities for improvement.

NABERS ratings are available for offices, hotels, shopping centres and homes. NABERS ratings for offices include energy, water, waste and indoor environment.

Minimum Energy Performance Standards (MEPS) in Australia[59]

MEPS programs are made mandatory in Australia by state government legislation and regulations which give force to the relevant Australian Standards. Regulations specify the general requirements for MEPS for appliances, including offences and penalties if a party does not comply with the requirements. Technical requirements for MEPS are set out in the relevant appliance standard, which is referenced in state regulations. State based legislation is necessary because the Australian constitution gives Australian States clear responsibility for resource management issues, including energy.

It is mandatory for the following products manufactured in or imported into Australia to meet the MEPS levels specified in the relevant Australian Standards.

Jurisdictional Energy Efficiency Schemes

At present, there is no national energy efficiency scheme in Australia.[60]In place of this, energy efficiency schemes have been implemented at the state level. Energy efficiency obligations having been introduced in three states: New South Wales (NSW), South Australia (SA) and Victoria (Vic).

The schemes implemented in these states include: the Victorian Energy Efficiency Scheme (Vic VEET) under the Energy Saver Incentive, the South Australian Residential Energy Efficiency Scheme (SA REES), and the New South Wales Energy Saving Scheme (NSW ESS).

While the objectives have expressed differently and the schemes operate differently, they all seek to reduce the amount of electricity used by consumers.

The objective of the Victorian VEET scheme is threefold :

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58 NABERS website at 090611 http://www.nabers.com.au/

59 MEPS website as at 090611 http://www.energyrating.gov.au/meps1.html

60 The Australian Government has announced as part of its clean energy future plan and response to the Final Report of the Prime Minister's Task Group on Energy Efficiency that further work will be undertaken on a national energy savings initiative. http://www.cleanenergyfuture.gov.au/clean-energy-future/securing-a-clean-energy-future/#content09

1. to reduce CO_2-e emissions;

2. to bring about the efficient consumption of energy; and

3. encourage growth in the energy services industries (i.e. industries which supply goods and services that reduce energy consumption)

The Victorian VEET scheme mandates that retailers of electricity and gas with more than 5000 customers in Victoria meet their proportionate share of the CO_2-e emissions reduction target by surrendering tradeable Victorian Energy Efficiency Certificates which correspond to energy savings achieved from prescribed activities.

The objective of the South Australian REES scheme is ultimately to reduce carbon dioxide emissions through the implementation of a suite of prescribed energy-saving activities, including energy audits, in South Australian households.

The South Australian REES scheme mandates that retailers of electricity and gas with more than 5000 customers in South Australia meet their share of the CO_2-e emissions reduction target and carry out 13,000 energy audits in low-income households during the 2009-2011 period. Liable retailers achieve these targets by offering incentives to residents to adopt approved energy saving measures and to participate in energy audits.

The principal objective of the NSW ESS, as stipulated in Part 9 of the Electricity Supply Act 1995, is to reduce electricity consumption by providing incentives to consumers to engage in energy-saving activities.

On 1 July 2009, the NSW ESS replaced the end-use energy efficiency component of the Demand Side Abatement Rule covered under the Greenhouse Gas Abatement Scheme.

NSW ESS participants include retailers, wholesale market customers, and electricity generators that supply electricity direct to end-use customers. Scheme participants must meet their share of the energy savings target through implementing Recognised Energy Savings Activities (RESA) in residential, commercial and industrial settings. Scheme participants can either carry out the prescribed activity or pay an Accredited Certificate Provider to do so.

An Energy Savings Certificate is created for each tonne of carbon dioxide emissions saved as a result of the reduction in electricity demand achieved from the implementation of the RESA.

B Factors required for economically efficient demand-supply balance