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Implications for Jemena Gas Networks (NSW) of Increasing Competition in the Consumer Energy Market

A Report for Jemena Gas Networks

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Executive Summary

The Australian Energy Regulator (AER) is currently considering its final decision on the proposed gas access arrangement for Jemena Gas Networks (NSW) Ltd (JGN) for the period 1 July 2015 to 30 June 2020. Since the last access arrangement review in 2009, east-coast energy markets comprising both electricity and gas have undergone profound technological, policy and market changes, which are expected to continue in the coming years.

These changes are affecting the awareness and choices available to consumers in New South Wales (NSW) when making decisions about the energy needs for their homes and businesses. With greater opportunities for substitution between electricity and gas, there is greater scope for competition between the fuels. This in turn places greater incentives on JGN to recognise and respond to market developments by being efficient and responsive in providing and pricing gas distribution services so as to maximise the opportunity for retail gas businesses to compete effectively with electricity – both grid based and alternative sources – for consumer energy demand.

With JGN facing increased downstream market-driven incentives to be cost efficient, thereby affecting its ability to exercise any market power, the AER should approach its regulatory task differently from that it adopts in relation to electricity networks. In particular, the AER should apply a stronger presumption that the regulatory proposal reflects efficient costs and promotes efficient use of the network. This approach acknowledges that the long-term interests of consumers are best served by minimising the scope for regulatory error, given the risk and so potential costs of JGN reducing service levels, investing unnecessarily, or inappropriately raising prices above efficient levels, is likely now to be lower than in the past.

Against this backdrop, we have been asked by JGN to examine the extent to which there is an increased opportunity for substitution from gas to electricity, and the implications for the incentives it faces in operating its natural gas network in NSW.

The form and administration of regulation depends on the substitutability of gas and electricity services

It is well recognised that in markets that are effectively competitive, rivalry between suppliers will lead to efficient outcomes. Conversely, regulation will lead to more efficient outcomes in situations in which a supplier faces only weak competitive pressure. Between these two extremes there is a spectrum over which the form and administration of regulation needs to adjust as the competitive constraints faced by a supplier increase.

The key trade off in designing and administering an efficient regulatory regime is between:

- the **benefits of competition,** which are lower prices, greater innovation and better service delivery (when competition is effective); and
- the **costs of regulation,** which are the direct costs of the regulatory process for the regulator and regulated entity, in addition to costs to society due to regulatory errors and associated inefficiencies resulting from the application of the regulatory framework.

The net outcome of this trade off favours lighter regulation as the degree of competition becomes stronger. As the Expert Panel on Access Regulation highlighted:[1]

> While the policy goal for regulation may be to replicate as far as possible what a competitive market would otherwise deliver, regulation is a poor substitute for effective competition.

[1] Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, p. 13.

It follows that the strength of the competitive threats faced by JGN should form a key part of the AER's analysis to inform its approach to administrating the regulatory arrangements for JGN.

Whilst JGN does not face competition from alternative gas distribution businesses, it does face competitive pressure from the potential for end-use gas customers to switch to alternative fuels – both established energy sources such as delivered electricity, as well as to energy sources such as solar hot water. The pressure is enhanced because JGN has a significant impact on the total cost of gas for consumers (comprising around 50 per cent of the average residential retail bill). Therefore, the principal competitive threat faced by JGN is that retail customers will switch to energy alternatives if the overall gas retail proposition is not competitive – in terms of service levels and prices.

It follows that, to the extent that enhanced competition in the consumer energy market acts to constrain a gas distribution business from exercising market power, then the AER should apply a stronger presumption that the regulatory proposal reflects efficient costs and promotes efficient use of the network. Consistent with this, differences in the characteristics of electricity and gas and their implications for regulation of the distribution services of these two fuels, was canvassed by the Expert Panel. The Panel said that the efficient unit cost of provision of natural gas may be sufficiently high in certain circumstances that competition from alternative energy sources provides an effective constraint on market power.[2]

Electricity is becoming increasingly substitutable for gas

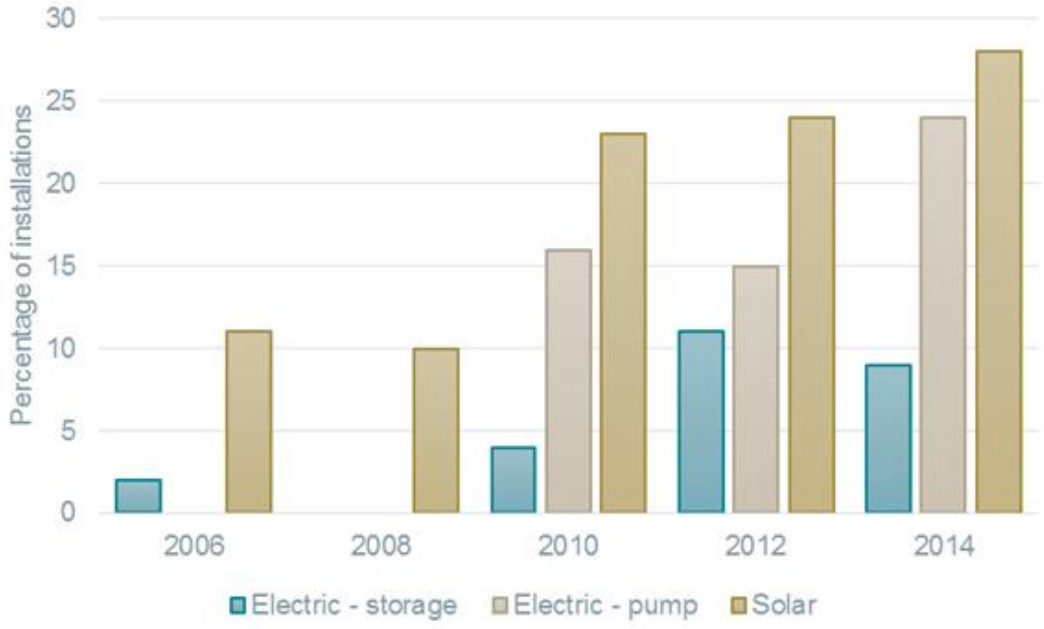
The Australian energy sector is undergoing profound change driven in part by the fall in electricity demand placing downward pressure on costs across the supply chain, significant investment in domestic solar PV capacity, and the emergence of a liquefied natural gas export industry in Queensland. While the implications for the electricity sector have been well acknowledged, less consideration has been given to how these factors are affecting the gas sector. In particular:

- customers are more aware of the choices they have between energy products and suppliers;
- technological, market and policy developments have increased the attractiveness of alternative energy sources for space and water heating; and
- the changes in relative prices of electricity and gas are increasing the competitiveness of electricity for many energy consumers.

There is also evidence that gas is increasingly being substituted with electricity. For example, the proportion of customers installing electric (storage or pump) or solar that are replacing gas hot water systems has increased to approximately a quarter in 2014 – see Figure E.1.

[2] Ibid, p.14.

Figure E.1: Percentage of hot water installations that replaced a gas system, for each technology installed



Source: HoustonKemp analysis of BIS Shrapnel, The household applicances market in Australia – Hot water systems, 2008, 2010, 2012, 2014

The increase in electric hot water systems replacing gas systems may be due in part to the price of solar hot water systems (including installation) in Australia declining by 27 per cent from 2008 to 2014 in real terms, while the price of heat pumps declined by 22 per cent from 2010 to 2014.[3]

In addition, the penetration of reverse cycle air conditioners in NSW households has increased from around 40 per cent in 2004, to close to 60 per cent in 2014.[4] This increases the scope for substitution from gas to electricity for space heating.

In short, competition from electricity as an energy fuel for gas consumers is becoming stronger. This is expected to be ongoing, leading to increasing potential for substitution from gas to electricity.

The AER should take account of increased scope for substitution in the energy market in its regulatory decisions

A large share of JGN's revenues comes from residential customers using gas hot water and space heating appliances. Therefore, the increased awareness and attractiveness of alternatives to gas for these uses, and the reduction in the price of electricity relative to gas, will have a substantial effect on JGN's business as it is faced with increased scope for substitution in the energy market. In particular:

- it will be less profitable for JGN (under a price cap) to increase its prices because retail customers are more likely to switch to alternative sources other than gas as a result; and
- this pressure on prices will also lead to a greater incentive on JGN to lower its average costs by ensuring it provides service levels that customers value, by pursuing operating and investment efficiencies, and by

[3] HoustonKemp analysis of BIS Shrapnel, *The household applicances market in Australia – Hot water systems*, 2008, 2010, 2012, 2014.

[4] Ibid.

setting prices and marketing its service so as to encourage continued growth in gas usage both to new and existing customers.

In addition, these incentives are enhanced by the regulatory framework, which provides the scope for the AER to remove gas network assets from the capital base in circumstances where they are redundant, say as a consequence of reduced consumption (Rule 85). This risk creates a strong financial incentive to do everything possible to maximise use of the gas network.

Greater opportunities for substitution between gas and electricity in NSW raises the prospect that the balance between the costs of regulation and scope for inefficiencies from the exercise of market power might support more light-handed forms of regulation for gas distribution services in the future. Given this prospect, the long-term interests of consumers would be promoted by the AER approaching its current regulatory task differently to its approach to electricity network service providers, where competition with alternative non-network energy sources is likely to have less of an effect on the scope for these businesses to exercise market power. As discussed earlier, the AER should apply a stronger presumption that the regulatory proposal reflects efficient costs and promotes efficient use of the network.

This conclusion is consistent with the actions of other regulators in Australia to reduce the extent of regulation for gas distribution businesses. For example, the National Competition Council (NCC) has recently approved a request by Envestra to remove coverage from its Queensland Gas Distribution Network (QGDN) and use light handed regulation instead.[5] The NCC said in making its final decision that the most significant constraint on market power associated with the QGDN is the ability for end users to substitute between other forms of energy ie, electricity and LPG with gas from the distributed network.

Overall, the risk in the short term of regulatory expenditure allowances being below efficient levels affects the ability of a regulated business to continue to provide the quality of network services desired by consumers. In the longer term, it can affect incentives for efficient investment in the network to provide services that might otherwise be valued by consumers.

[5] NCC, *Light Regulation of Envestra's QGDN – Final determination*, November 2014, p. 18.

1. Introduction

The Australian Energy Regulator (AER) is currently considering its final decision on the proposed gas access arrangement for Jemena Gas Networks (NSW) Ltd (JGN) for the period 1 July 2015 to 30 June 2020. Since the last access arrangement review in 2009, the east-coast energy market, comprised of both electricity and gas, has undergone profound changes, which will continue in the coming years. In particular:

- retail electricity prices have increased significantly in NSW over the period from 2007 to 2014 – a development that has exerted upward pressure on gas demand – but are now forecast to fall as a result of a number of factors, including declining network prices and continued low prices in the wholesale electricity sector;
- notwithstanding the prospect of lower electricity prices in the future, the prolonged period of high electricity prices has increased customers' focus on energy costs and led many to explore alternative forms of energy supply; and
- the emergence of a liquefied natural gas (LNG) export industry in Queensland has led to a step change in wholesale gas prices on the east coast, with domestic gas prices now converging up to LNG netback parity.[6] This would lead to an increase in retail gas prices if the costs imposed by the rest of the supply chain remain the same.

These changes create similar challenges for gas network and retail businesses as those that are well documented in the electricity industry. Specifically:

- technological advancements in water and space heating, and government policies are placing competitive pressure on key parts of JGN's gas distribution businesses; and
- the recent increase in the gas price relative to electricity has led to electricity supply becoming more attractive.

In an environment of declining consumer demand for energy, the gas supply chain must compete with grid based and other electricity services by providing service levels that customers' value and price levels and structures that are competitive with alternatives. Network costs represent a large proportion of retail supply costs for small gas customers, and so the decisions of gas network businesses have significant implications for outcomes in the retail gas market, including the relative competitiveness of gas with electricity.

Against this backdrop, JGN has asked us to examine the competitive tensions in the NSW energy market, the potential for customers in its NSW gas distribution network to switch to an alternative form of energy supply as well as the implications for JGN in providing network services and the AER in regulating these services. Our analysis addresses three considerations or perspectives, namely the:

- different types of customers that JGN supplies, their contribution to JGN's total revenue, and the way in which they use gas in their home or business;
- choices available and awareness of choices to each customer group to power their home or business; and
- competitiveness of JGN's services with alternatives.

Based on our findings, we have been asked to explain the implications for JGN in determining its service levels, costs and prices.

The remainder of this report is structured as follows:

[6] LNG netback prices simulate an export parity price by stripping out shipping, transportation and liquefaction costs.

- section 2 explains that the appropriate form and administration of regulation for JGN depends on the extent to which it has market power, which is changing as a consequence of developments in the energy market;
- section 3 sets out information as to each of JGN's main customer classes, ie:
  - the quantity of gas that they consume;
  - the purpose for which they consume gas (eg, cooking, space-heating); and
  - the contribution of those customers to JGN's total revenue;
- section 4 examines recent trends in the availability and awareness of alternatives to gas;
- section 5 examines the factors that are increasing the price of gas and decreasing the price of electricity; and
- section 6 sets out the implications of increasing competition in the consumer energy market for JGN and the administration of the current regulatory framework by the AER for JGN's current gas access arrangement review.

2. Competition, Market Power and the Form and Administration of Regulation

Increasing opportunities for substitution between gas and electricity has implications for both the choice of the form of regulation applied to gas networks, and how that choice is administered by the AER.

In this section we first explain the theoretical concepts underpinning the choice of the form of regulation, and so why effective competition is to be preferred to regulation. This is followed by a brief summary of the factors relevant to the choice of form of regulation, and a discussion of how changes in any one of those factors might influence the approach adopted by the AER in the administration of the regulatory framework.

2.1 The relevance of competition and market power

The starting point for the design of any regulatory framework is to consider the extent to which a business has an opportunity to exercise substantial (as opposed to temporary) market power, which results in prices rising above that level needed to recover the efficient costs of providing the service. Competition, which is a process by which firms strive to secure customers against rivals, limits the extent to which a firm has market power. It follows that market power is the antithesis of competition.

It is well recognised that the process of competition between suppliers will lead to efficient outcomes in markets that are effectively competitive. Conversely, regulation will lead to a more efficient outcome in situations in which there is a monopoly supplier with market power facing no competitive pressure. Between these two extremes there is a spectrum over which stricter forms of regulation becomes less efficient as the level of competition faced by a supplier increases.

Competition leads to efficient outcomes when it is effective because:

- suppliers have an incentive to provide better services at lower prices than its competitors in order to win business;
- suppliers that are under competitive pressure have an incentive to use the best available technologies and improve their products over time; and
- suppliers have an incentive to invest efficiently in order to increase their sales. Further, more efficient firms will grow when suppliers face effective competition.

In the absence of effective competition, regulation seeks to promote efficient use of and investment in the services provided by the regulated firm. The incentives faced by a regulated firm to promote cost efficiency are never as effective as those under competition. As explained by the Expert Panel on Energy Access Pricing (the Panel):

> Access regulation can never be perfect, however, while the policy goal for regulation may be to replicate as far as possible what a competitive market would otherwise deliver, regulation is a poor substitute for effective competition.[7]

In light of the deficiencies of regulation compared with competition, it should only be used when the benefits outweigh the costs. The Panel goes on to explain that:

> … regulation is not costless, and indeed, if applied in inappropriate circumstances or in an inappropriate manner, the cure may be worse than the disease.[8]

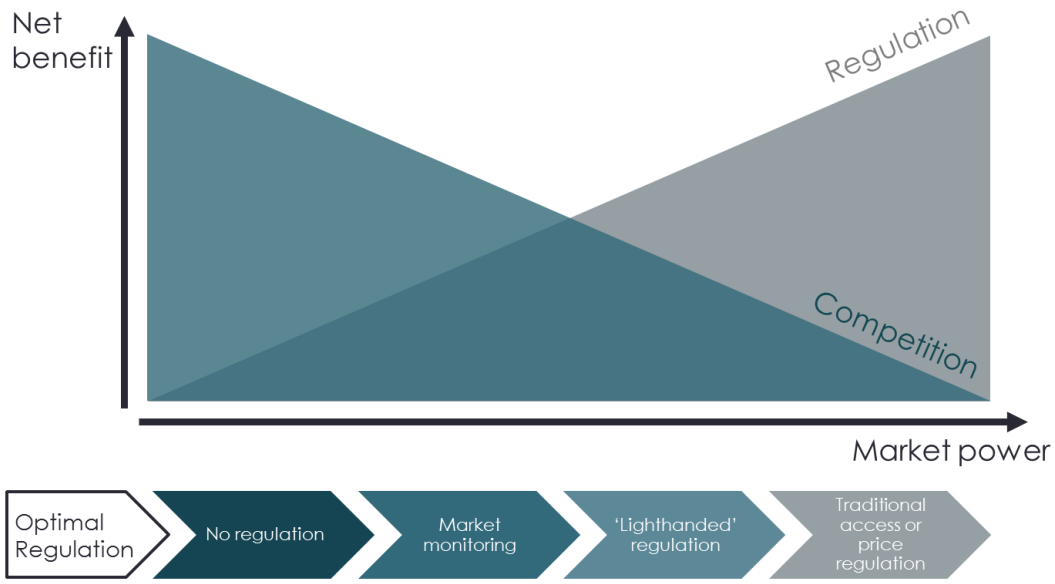
[7] Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, p. 11.

[8] Ibid, p. 7.

Given the advantages of competitive market incentives over regulatory incentives, less regulation is preferred as the degree of competition becomes stronger, as depicted in Figure 2.1. The Panel explained that

> In circumstances where actual or potential competition exists, the costs of seeking to improve on market outcomes through more intrusive forms of regulation may exceed any efficiency benefits to be achieved.[9]
>
> The regulatory response should be commensurate with the extent of market power that is involved and the costs and inefficiencies that can result from its exploitation.[10]
>
> Less intrusive forms of regulation typically involve lower administrative costs and are more appropriate where market power is less substantial and there is potential for contestability to emerge.[11]

Figure 2.1: Stylised depiction of the relationship between market power and optimal regulation



2.2 Specific factors relevant to the choice of the form of regulation

It is well recognised that the degree of market power held by regulated firms can change over time as technology and consumer preferences develop.

Gas networks have always been recognised as having less market power compared with electricity networks due to the greater opportunity for gas to be substituted by electricity than vice versa. The Panel indicated that:[12]

> Electricity is an established fuel source of substantial importance to industrial, commercial and residential users and one for which there are few practical substitutes for many applications, which (combined with a technology that means alternative supply is infeasible) provides distribution networks with substantial market power. This situation is similar for the gas distribution networks in many of the major Australian gas markets, the Victorian market being a key example. However, there are a number of areas where the supply of natural gas has recently been introduced, and hence market power does not exist. Moreover, even in the large gas markets, where rates of

[9] Ibid, p. 41.

[10] Ibid, p. 41.

[11] Ibid, p. 44.

[12] Ibid, p. 14.

> connection and/or average usage is low, then the unit cost of provision of natural gas may be sufficiently high that competition from alternative energy sources provides an effective constraint on market power. [emphasis added]

The National Gas Law (NGL, Chapter 3, Part 2) explicitly allows a gas network service provider to apply to the National Competition Council (NCC) for a determination that pipeline services be subject to light regulation, as compared to full access regulation administered by the AER. In making its decision on whether to approve an application for light regulation, the NCC must have regard to the national gas objective and the form of regulation factors, as set out in section 16 of the NGL, and any other relevant factor.[13] The form of regulation factors are:

> (a) the presence and extent of any barriers to entry in a market for pipeline services;
>
> (b) the presence and extent of any network externalities (that is interdependencies) between a natural gas service provided by a service provider and any other natural gas service provided by the service provider;
>
> (c) the presence and extent of any network externalities (this is, interdependencies) between a natural gas service provided by a service provider and any other service provided by the service provider in any other market;
>
> (d) the extent to which any market power possessed by a service provider is, or is likely to be, mitigated by any countervailing market power possessed by a user or prospective user;
>
> (e) the presence and extent of any substitute, and the elasticity of demand, in a market for a pipeline service in which a service provider provides that service;
>
> (f) the presence and extent of any substitute for, and the elasticity of demand in a market for, electricity or gas (as the case may be);
>
> (g) the extent to which there is information available to a prospective user or users, and whether that information is adequate, to enable the prospective user or user to negotiate on an informed basis with a service provider for the provision of a pipeline service to them by the service provider.

The factor for which circumstances are most changing for both gas and electricity network service providers is factor (f), ie, the presence and extent of any substitute for gas.

The inclusion of this mechanism within the NGL highlights its importance as part of the regulatory framework applying to gas distribution networks, and is a distinguishing feature of the regulatory framework for gas networks compared to electricity networks. In our opinion, these factors are equally important considerations for the AER when it is exercising its regulatory discretion under the current regulatory framework.

It has been well documented that network sourced electricity is facing competitive threats from the increasing feasibility of micro-generation, potentially combined with battery storage technology, making disconnection from the grid possible for some customers and increasing the prevalence of customers substituting a portion of their grid-delivered energy use for alternative energy sources.

Similarly, growing competition for gas by substitution with electricity, in part due to the same threats to network sourced electricity and also some additional gas specific factors, is lowering residential average usage. This in turn, leads to a greater scope for alternative energy sources becoming an effective constraint on the market power of gas network businesses.

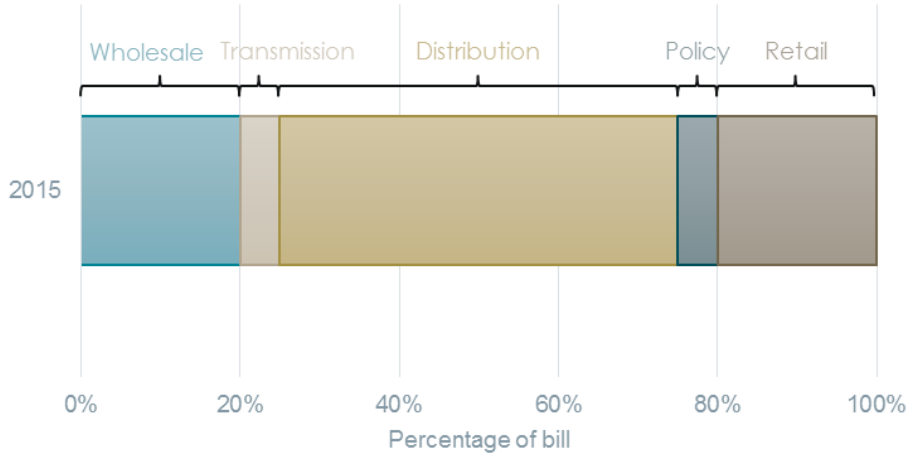
[13] Section 112(2), NGL.

2.3 Competition between electricity and gas is an important determinant of the extent to which JGN has market power

Whilst JGN does not face competition from alternative gas distribution businesses, it does face competitive pressure from the potential for end-use gas customers switching to alternative fuels – both established energy sources such as delivered electricity, as well as alternative energy sources such as solar hot water.

The reason for this is that around half of the average retail gas bill in NSW is the cost of distribution – see Figure 2.2. It follows that the average retail gas bill will increase by five per cent if JGN increases its price by ten per cent, and the retailer fully passes on the increase in the cost of distribution. This increase in the retail gas bill could decrease the competitiveness of gas relative to electricity.

Figure 2.2: NSW retail gas bill by contributing cost components, 2014/15



Source: HoustonKemp analysis of JGN, Our proposed network prices – Fact sheet, 2014

Given the high proportion of network costs in the overall retail gas bill, changes in JGN's costs (and so prices) can have a significant effect on the competitiveness of retail gas compared with electricity. It follows that increasing opportunities for substitution between gas and electricity heightens the effectiveness of the competitive constraint on JGN's costs, separate from the incentives within the regulatory framework.

We discuss in section 6 the implications for the AER and JGN of these competitive incentives for the application of the current regulatory arrangements.

3. Hot Water and Heating are Important to JGN

The principle uses of gas include for residential hot water, space heating, cooking and business needs. In this section we show that the use of gas for residential hot water and heating are two of the key drivers of JGN's revenue because:

- the majority of JGN's revenue is from residential customers; and
- the majority of gas supplied by JGN for residential purposes is used for hot water and heating.

This implies that any change to the availability or competitiveness of gas relative to alternative energy sources for hot water and heating would have significant implications for JGN's revenues.

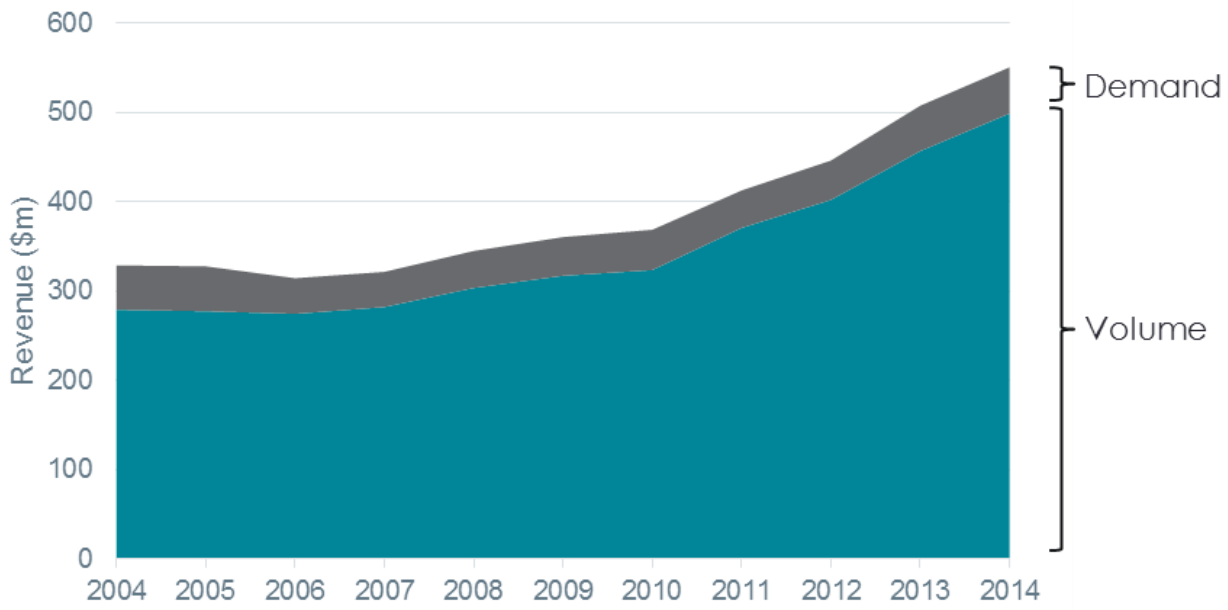
3.1 Residential customers make up the majority of JGN's revenue

JGN has two broad types of customers, ie:

- volume market customers, consisting of residential and business customers on tariffs that include a fixed and usage component, who consume less than 10TJ per year; and
- demand market customers, consisting of large industrial customers on tariffs that are based on maximum daily demand, who consume more than 10TJ per year.

The majority of JGN's revenue comes from volume market customers, as shown in Figure 3.1.

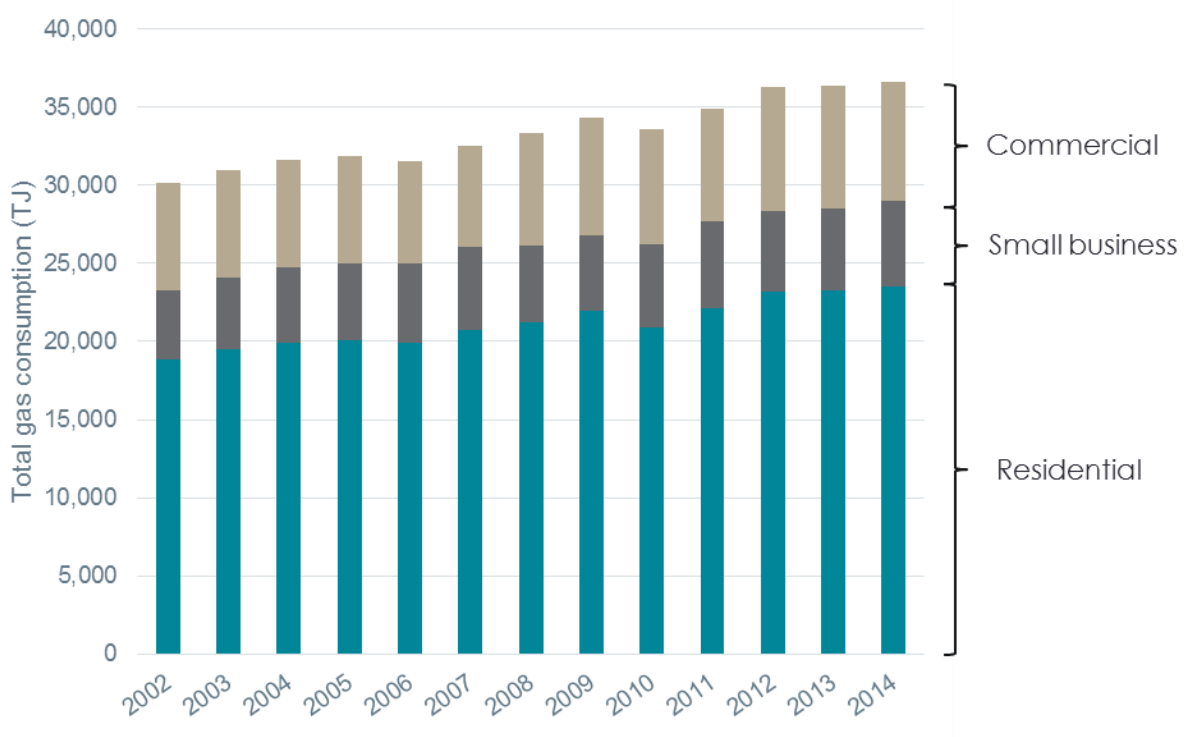
Figure 3.1: JGN revenue by customer type



Source: HoustonKemp analysis of information provided by JGN

Residential customers form the largest part of gas consumption by JGN's volume market customers, as shown in Figure 3.2. This also shows that total gas consumption has been generally increasing for volume market customers as a whole over the last ten years. However, this growth has been at a lower rate than the growth in the number of customers, and therefore the average usage by volume market customers is falling.

Figure 3.2: Annual total gas consumption by volume market customers



Source: HoustonKemp analysis of information provided by JGN

Residential customers consumed 64 per cent of the gas supplied to volume market customers in 2014. The declining block tariff (DBT) means that the average price paid for gas (per GJ) is higher for customers using a lower amount of gas. Therefore, residential customers are likely to pay more for gas, on average, than commercial and small business customers that use a greater amount of gas per customer.[14] As such, residential customers contribute greater than 64 per cent of JGN's revenue from volume market customers. Given volume market customers contributed over 90 per cent of JGN's revenue in 2014, it follows that residential customers alone contributed over 58 per cent of JGN's revenue.[15]

[14] For example, JGN, *2015-20 Access Arrangement Information, Appendix 1.8*, June 2014, p. 23.

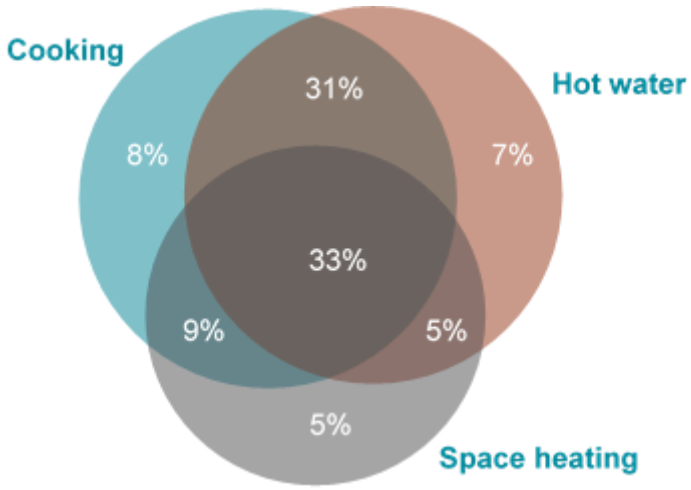
[15] The contribution of revenue by residential customers is equal to the contribution of residential revenue to all volume revenue multiplied by the contribution of revenue by volume market customers to total revenue.

3.3 Residential gas is primarily used for hot water and heating

Approximately 44 per cent of households in NSW used mains gas in 2014.[16] They use it for cooking, hot water and space heating in all possible combinations and usually for more than one use, as shown in Figure 3.3. We note that:

- 81 per cent of customers use gas for cooking;
- 76 per cent of customers use gas for hot water; and
- 52 per cent of customers use gas for heating.

Figure 3.3: Uses of gas by Sydney residential gas customers in 2010 (% of customers)[17]



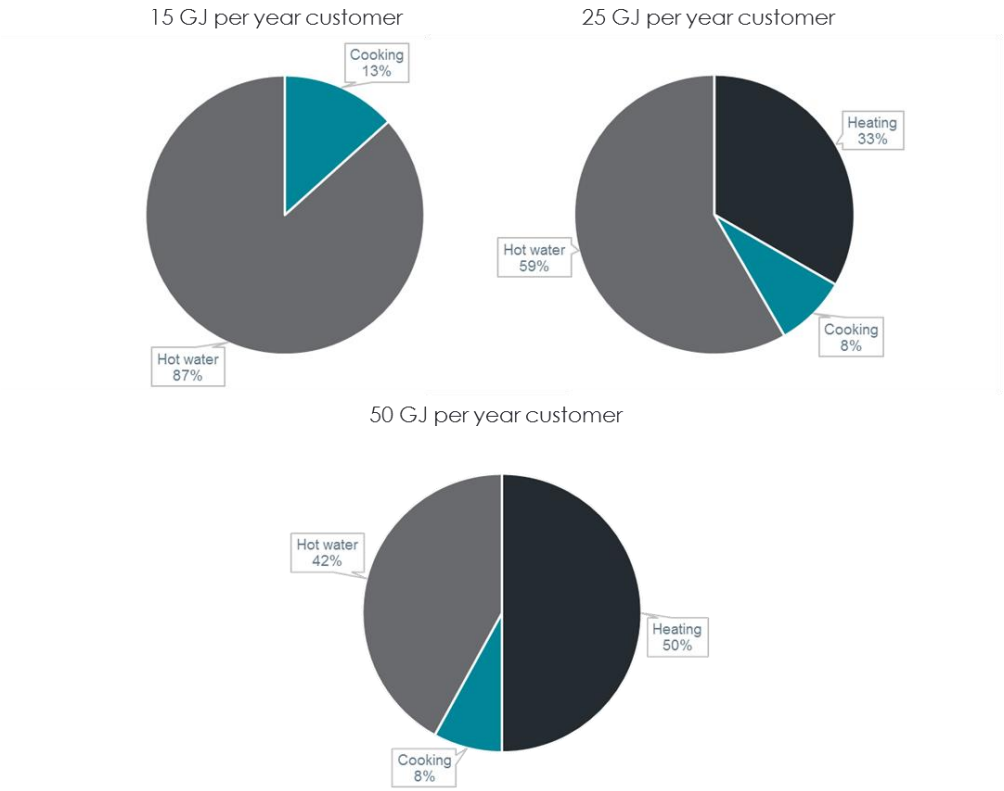
Source: HoustonKemp analysis of information from IPART, Residential energy and water use in Sydney, the Blue Mountains and Illawarra, 2010

We understand that a typical residential customer in the coastal parts of NSW use approximately 15 – 20 GJ of gas per year. Customers that use 15 GJ and 25 GJ per year use most of their gas for hot water and only around 10 per cent of their gas is used for cooking, as shown in Figure 3.4. Typical residential customers in regional areas that have larger gas usage, such as 50 GJ per year, use a higher proportion of their gas for heating. It follows that the typical residential customer is likely to use gas for hot water, heating and cooking, in that order.

[16] ABS, *Environmental Issues – Energy Use and Conservation*, 2014.

[17] Total not 100 per cent because IPART have excluded those households that use gas as a secondary source of energy for hot water (eg, gas boosted solar).

Figure 3.4: Typical gas usage profiles for residential customers in NSW – 15 GJ, 25 GJ and 50 GJ per year customers



Source: HoustonKemp analysis of information provided by JGN, publically available in JGN, Demand for our gas services fact sheet, February 2014

We conclude from the above analysis that JGN earns the majority of its revenue from residential uses, and in particular, hot water and space heating.

4. Increased Customer Choice

This section demonstrates that the availability and awareness of a choice between gas and alternative forms of energy supply has increased in the last few years. It sets out:

- how consumers have become more aware of their retail energy choices; and
- some of the key technological changes in the consumer energy market.

4.1 Improved consumer awareness of alternative forms of energy supply

A number of changes have occurred recently that have contributed to increased consumer awareness of the ability to manage better their energy usage including considering alternative forms of energy supply, such as:

- increases in energy costs;
- subsidies for renewable technologies and energy efficiency programs;
- the development of retail competition and increased switching between energy suppliers; and
- the development of tools for comparing energy supply options.

Electricity retail prices have risen considerably in the last ten years, increasing household expenditure on energy needs. In particular, average weekly expenditure on domestic energy increased from $22 in 2003-04 to $38 in 2012.[18] Spending on energy now represents four per cent of the disposable income for the average household in Sydney and the surrounding regions.[19]

This increase in the cost of electricity is likely to be one of the reasons that customers are now concerned about their energy bills. For example, a survey for the Energy Efficiency Council found that more of the households surveyed are very concerned about electricity bills than any other household expense.[20] We expect that this concern would drive customers to look for ways in which they can reduce the cost of their energy needs.

The federal and state governments have introduced a wide range of policies to increase energy efficiency and support renewable energy production. For example, the Small-scale Renewable Energy Scheme (SRES) was introduced to help meet the renewable energy target (RET). The SRES creates a financial incentive for the installation of eligible small-scale renewable energy systems such as solar water heaters, heat pumps and solar photovoltaic (PV) systems.[21] These policies have enabled customers to receive substantial financial benefits, reducing the upfront costs of installing alternative solar products and encouraging a large number of customers to consider and take-up a new source of energy.

The retail gas and electricity markets were opened up to full retail contestability in NSW for small energy consumers in 2002. The Australian Energy Market Commission (AEMC) and IPART recently found that competition was sufficiently robust for it to recommend removing retail price regulation, in part because:[22]

[18] ABS, *Household Expenditure Survey*, 2003-4; ABS, *Household Expenditure Survey*, 2009-10; and ABS, *Household Energy Consumption Survey 2012*, 2012.

[19] IPART, *Changes in regulated retail gas prices from 1 July 2014 – Final report*, June 2014, p. 44.

[20] Energy Efficiency Council, Choice and Brotherhood of St Laurence, *Survey of community views on energy affordability – Australia*, November 2013.

[21] It legislates demand for Small-scale Technology Certificates (STCs) which are created for these systems at the time of installation according to the amount of electricity they are expected to produce or displace in the future, and can then be traded to subsidise the cost of installation. Australian Government Department of the Environment, *The Renewable Energy Target Scheme website*, accessed January 2015, accessible at: http://www.environment.gov.au/climate-change/renewable-energy-target-scheme.

[22] AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, October 2013, p. i. IPART has explained that competition in the retail gas and electricity markets of NSW now protects customers against market power by offering

- retailers have had to compete more actively to attract and retain customers by providing greater discounts; and[23]
- consumers are responding to increasing prices by shopping around and taking advantage of the numerous competitive offers available.[24] They have been changing electricity and gas retailers at increasing rates and the number of consumers on regulated tariffs is consistently decreasing.[25]

This growth in shopping around is consistent with research undertaken for JGN, which found that online energy price comparison queries grew 12 per cent year-on-year in 2014.[26]

There are now a range of tools available for customers to compare their energy supply options, including a number of independent websites that compare energy suppliers.[27] Further, under the National Energy Retail Law, which came into effect on 1 July 2012, the AER developed and must operate a price comparator website for energy suppliers.[28] This reduces the cost for consumers of searching for, and comparing suppliers.

The AEMC is currently implementing a package of reforms aimed at giving consumers more opportunities to make informed choices about the way they use electricity based on the benefits that end use services provide. Therefore, it is likely that competition in the retail electricity market will continue to develop and support active engagement by consumers.

4.2 Technological change has increased availability of alternative forms of energy supply

Practically all households in Australia use electricity, and therefore have the option to switch from gas to electricity.[29] This section examines the key technological changes that are increasing the attractiveness of alternatives to gas in the key residential segment, ie:

- water heating;
- space heating; and
- solar PV.

4.2.1 Water heating

Water can be heated using gas and a number of alternative technologies, ie:[30]

- instant electric – whereby water is heated when it is required;
- electric storage – whereby a tank of water is heated that can be used on demand; and
- solar hot water – whereby a tank of water is heated using energy from the sun. This can be supported by gas or electricity when there is insufficient solar energy.

Historically heating water using electricity was an expensive option for the typical retail energy customer. However, innovation in electric heat pumps for water heating and solar hot water systems has increased the

more choices and better price and service outcomes. See IPART, *Changes in Regulated Retail Gas Prices from 1 July 2014*, Final Report, June 2014, p. 13 and IPART, *Review of Regulated Retail Prices and Charges for Electricity*, Final Report, p. 30.

[23] AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, October 2013, pp. i-ii.

[24] AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, October 2013, p. ii.

[25] AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, October 2013, p. ii.

[26] JGN/Reprise, *Energy Price Comparison*, February 2015, p. 5.

[27] For example, http://energy.iselect.com.au/electricity/ and http://www.comparethemarket.com.au/energy, accessed 16 February 2015.

[28] See http://www.energymadeeasy.gov.au/about-us, accessed 10 February 2015.

[29] See http://www.abs.gov.au/ausstats/abs@.nsf/0/592AD62D4C180700CA25773700169C2C?opendocument, accessed 16 February 2015.

[30] Water can be heated with either distributed gas or bottled LPG gas.

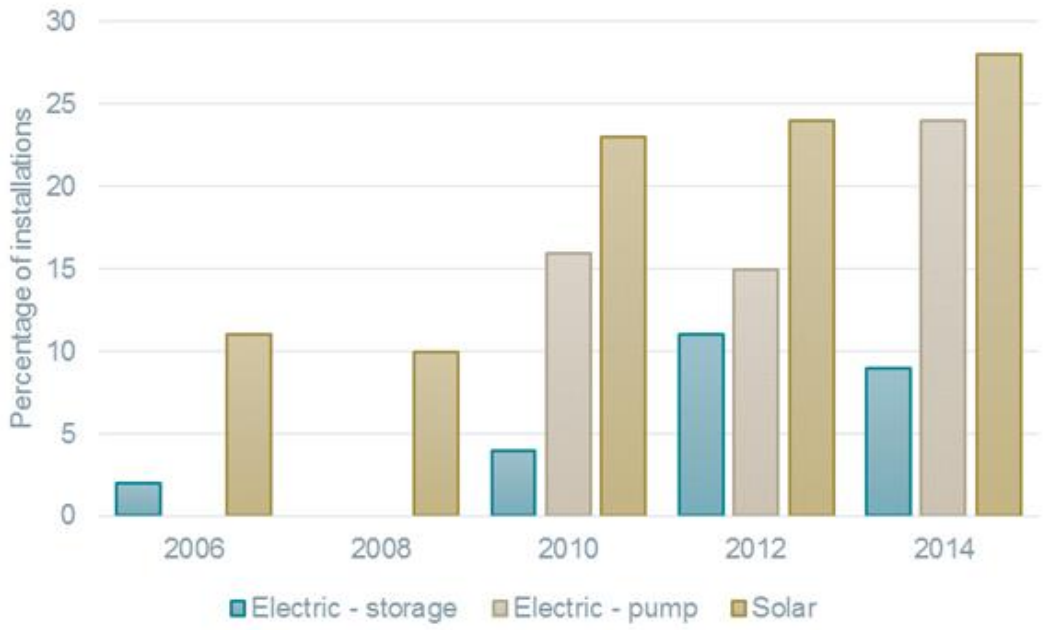
efficiency of electric hot water at an affordable price point to make it a competitive option for consumers. The increased availability of viable alternatives to gas hot water is apparent from:

- the increased proportion of customers who are switching between technologies, or considering doing so; and
- the reduction in the cost of using electricity as the installation cost of alternatives to gas hot water fall and the use of off peak tariffs increases.

Switching between types of water heating technology

Figure 4.1 below shows that the proportion of customers installing electric (storage or pump) or solar that are replacing gas hot water systems has increased to approximately a quarter in 2014.

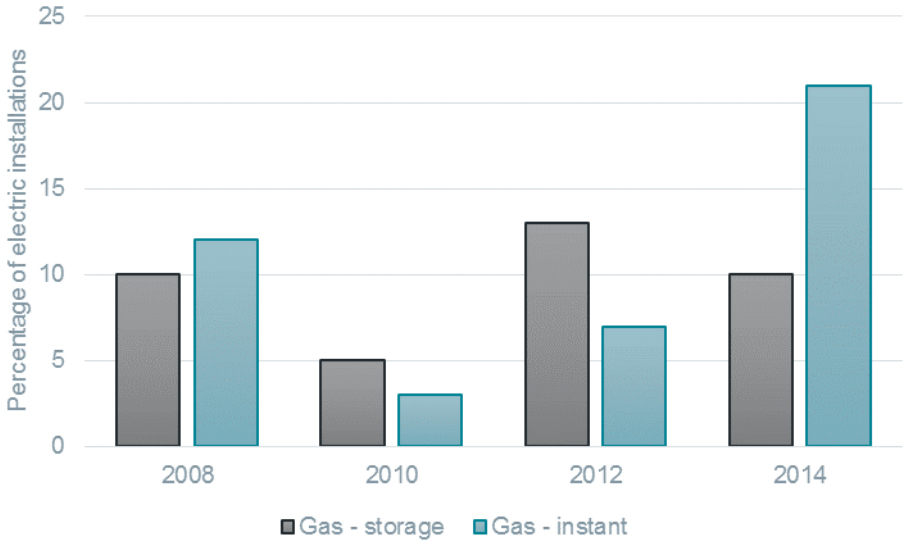
Figure 4.1: Percentage of hot water installations that replaced a gas system, for each technology installed



Source: HoustonKemp analysis of BIS Shrapnel, The household applicances market in Australia – Hot water systems, 2008, 2010, 2012, 2014

Similarly, Figure 4.2 shows that the proportion of customers purchasing electric hot water systems that considered gas as an alternative has increased recently. This evidence is consistent with a conclusion that electricity and gas are competing more strongly as the energy fuel for hot water heating.

Figure 4.2: Purchasers of electric hot water systems in NSW who considered gas options, by gas technology



Source: HoustonKemp analysis of BIS Shrapnel, The household applicances market in Australia – Hot water systems, 2008, 2010, 2012, 2014

Reduction in the cost of using alternative energy sources

The price of electricity rose significantly from 2004 to 2014.[31] However, two factors are pushing down the cost of installing and operating alternatives to gas hot water, namely:

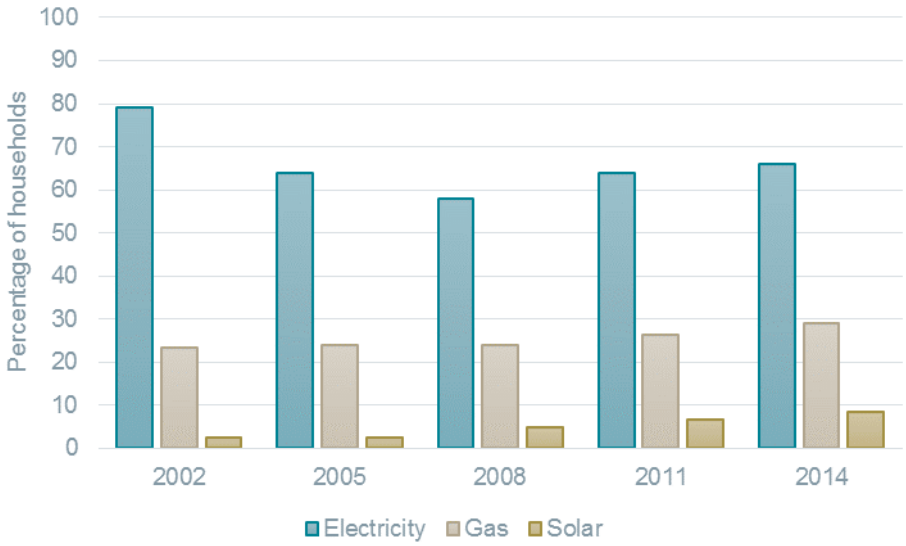
- a fall in the price of solar hot water and heat pumps; and
- the increased use of heating water with electricity during off-peak periods.

The penetration of solar water heaters increased from around 2008 onwards as a result of improvements in their efficiency and effectiveness – see Figure 4.3. This may be due in part to the price of solar hot water systems (including installation) in Australia declining by 27 per cent from 2008 to 2014 in real terms, while the price of heat pumps declined by 22 per cent from 2010 to 2014.[32]

[31] See section 5.1.

[32] HoustonKemp analysis of BIS Shrapnel, *The household applicances market in Australia – Hot water systems*, 2008, 2010, 2012, 2014.

Figure 4.3: Household penetration of water heating technologies in NSW, by fuel source



Source: HoustonKemp analysis of ABS, Environmental Issues – Energy Use and Conservation, 2008, 2011, 2014

Government subsidies for renewable technologies rose at the same time that the price of solar hot water units (including installation costs) was falling. In NSW at present, households can benefit from a rebate for purchasing eligible solar or heat pump water heaters through the SRES. For example, the average customer in NSW can expect to receive an upfront rebate of roughly one third ($1,120) of their solar water heater installation cost, or half ($1,080) of the installation cost for a heat pump – see appendix A1.1.

The price of electricity is substantially lower in off peak times. For example, the price of electricity for a residential EnergyAustralia customer on a basic time-of-use tariff in January 2015 was 47.03 c/kWh at peak times and 10.19c/kWh for off-peak.[33] The proportion of NSW households with electric or solar hot water heaters that are on an off-peak tariff has risen from 54 per cent in 2010, to 71 per cent in 2014.[34] This will reduce the average cost of using electric hot water appliances relative to gas.

It follows from the above that there is a greater range of competitive alternatives to gas hot water than there were a few years ago, and customers are increasingly considering and taking-up these options.

4.2.2 Space heating

Historically the cheapest and most effective option for space heating was with gas. However, innovations in reverse cycle air conditioning and subsequent uptake by consumers has provided a choice between using gas or electricity for space heating.

It is apparent that the availability of viable alternatives to gas space heating has increased from:

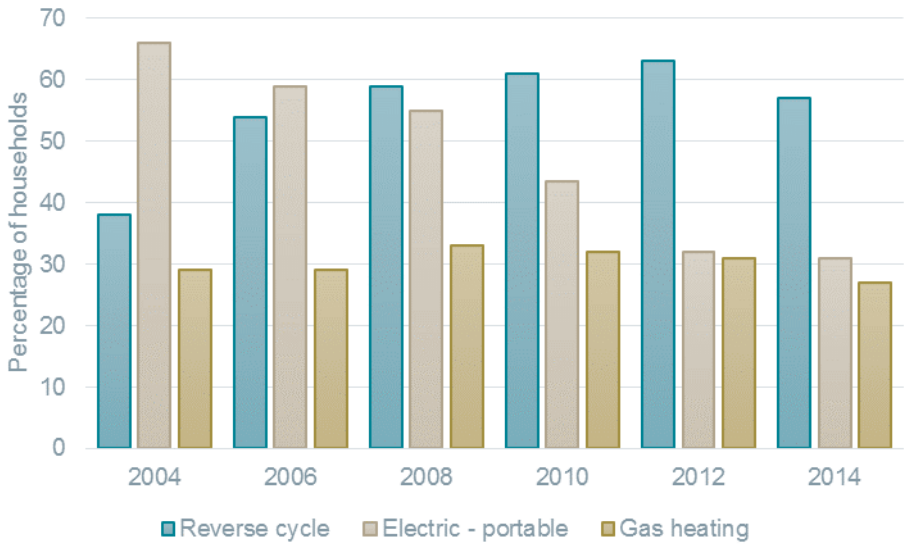
- the increased availability and affordability of reverse cycle air conditioners which may be used to heat homes; and
- customers are choosing gas for a number of reasons and not only because they already have a gas connection.

[33] EnergyAustralia, *Energy Price Fact Sheet – NSW Residential (Electricity)*, January 2015, accessible at: https://secure.energyaustralia.com.au/EnergyPriceFactSheets/Docs/EPFS/E_R_N_RSOT-E_EA_01-01-2015.pdf, accessed 26 January 2015.

[34] BIS Shrapnel, *The household appliances market in Australia – Hot water systems*, September 2010, p. 25; July 2014, p. 8.

Figure 4.4 shows that the penetration of **reverse cycle air conditioners** in NSW has increased from around 40 per cent in 2004 to close to 60 per cent in 2014. The penetration of portable electric heaters has fallen substantially over the same period. However, the use of reverse cycle air conditioners for heating may be more attractive than using portable heaters because they generally use electricity more efficiently.[35] The ownership of gas heating technologies has also fallen, from 33 per cent of households in 2008 to 27 per cent in 2014, despite the increase in the price of electricity relative to gas over that period (described in section 5).

Figure 4.4: Household ownership of space heating technologies in NSW, by technology



Source: HoustonKemp analysis of BIS Shrapnel, The household applicances market in Australia – Climate control, 2008, 2012, 2014

Approximately 57 per cent of households in NSW own reverse cycle air conditioners, whilst 27 per cent use them as their main source of heating in cooler months.[36] This suggests that around 30 per cent of households have reverse cycle air conditioners available but do not use it as their main source of heating in cooler months. In other words, those customers could quickly and easily start to use electric heating in response to rising gas prices and decreasing electricity prices.

Lastly, the most often stated reason for choosing gas over electricity in a recent survey was that gas heating had cheaper running costs (44 per cent of those surveyed in 2014) and was more efficient (35 per cent of those surveyed in 2014).[37] As such, customers are making an **informed choice** based substantially on the cost of operating gas relative to electric heating. This implies that customers may choose gas less often if it becomes more expensive relative to electricity.

4.2.3 Solar PV

Historically, energy used by households was generated centrally, for example in a coal fired power station or gas production facility, and then distributed to the household for consumption. However, developments in small-scale renewable technologies is upsetting this status quo. The ability of households to generate electricity through small scale solar, wind or hydro technologies provides them greater choice over when and how they consume energy.

Government policies supporting these renewable technologies is one reason for the substantial growth in the capacity of solar PV systems installed in NSW, from around 25,000 kW before 2010 to almost 800,000 kW at

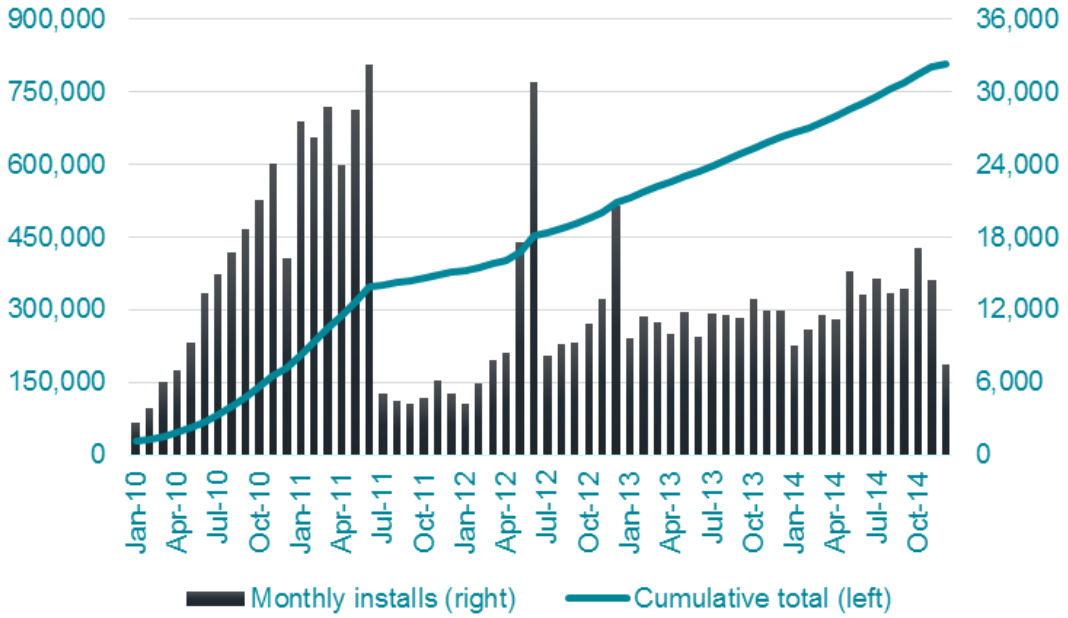
[35] See for example, AusGrid, *Winter Heating*, p. 3.

[36] BIS Shrapnel, *The household applicances market in Australia – Climate control*, 2014, p. 9.

[37] BIS Shrapnel, *The household applicances market in Australia – Climate control*, 2014, p. 81.

the end of 2104 – see Figure 4.5. Further, AEMO's 2014 forecasts expect rooftop solar PV to increase from roughly 6.3 per cent of total installed generation capacity in the National Electricity Market (NEM) and two per cent of the NEM's energy requirements in 2013/14, to 17 per cent and 6.3 per cent respectively by 2022/23.[38]

Figure 4.5: Household installations of solar PV systems in NSW (kW of capacity)



Source: HoustonKemp analysis of Clean Energy Regulator, Renewable Energy Target – Small-scale installations by postcode, 2015

Installers of these systems usually offer a discount on the price of an installation, or a cash payment, in return for the right to create the STCs.[39] This provides an additional incentive for households to purchase small-scale renewable energy systems. For example, Appendix A1.2 shows that a representative NSW household is able to create 51 STCs on the installation of a solar PV system, which are worth $2,040. In addition, the installed capacity shown in Figure 4.5 is indicative of the amount of STCs, or before 2011 RECs, created for solar PV in the past five years.

The cost of using electric appliances relative to gas falls for those customers who install solar PV for two reasons:

- customers do not need to pay for the energy generated by the solar PV system. This could be used to pay for an electric hot water system for example; and
- the inclining block tariff for electricity means that customers who use energy generated by the solar PV require less distributed energy and can benefit from moving to a lower consumption tariff at a reduced price.

Further, advances in battery technology and the continuing uptake of solar PV are increasing the availability of this option for households. It follows that an increasing number of customers are able to substitute gas for energy generated by small scale renewable technologies should the gas price continue to rise.

[38] AER, *State of the energy market report*, 2104, p. 29.

[39] Australian Government Department of the Environment, *The Renewable Energy Target Scheme website*, accessed 15 January 2015, accessible at: http://www.environment.gov.au/climate-change/renewable-energy-target-scheme.

5. Electricity is Becoming Increasingly Competitive with Gas

Gas has always competed with electricity for its share of the retail energy market – being a cost effective alternative to electricity over a long period. However, over the past two years this competitive advantage has begun to diminish due to profound changes in the supply of both electricity and gas.

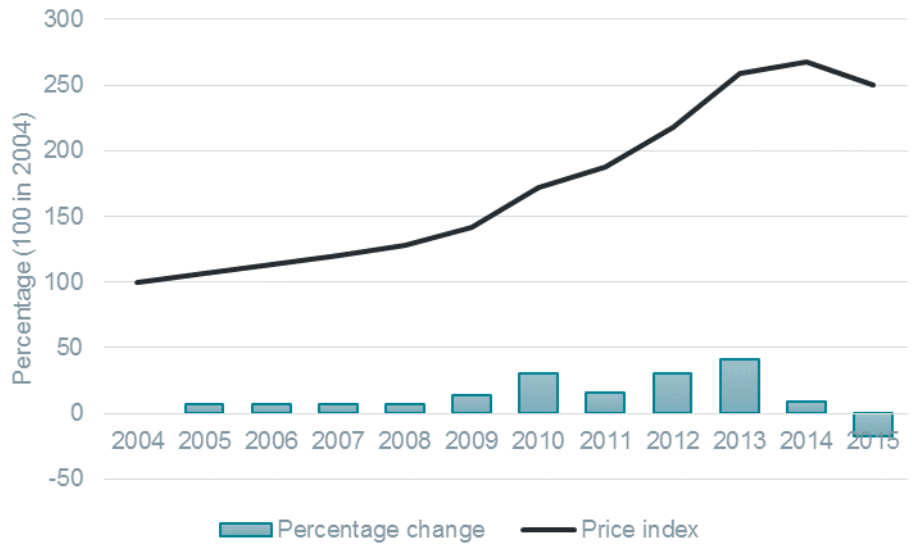
In this section we explain that:

- retail electricity prices have been increasing, but are now forecast to fall;
- retail gas prices have been increasing for a substantial period, whilst wholesale gas prices are rising and this trend is forecast to continue; and
- trends towards more efficient tariff structures for electricity will affect the attractiveness of gas relative to electricity.

5.1 Retail electricity prices are forecast to fall

Figure 5.1 shows that retail electricity prices in Sydney have risen significantly in recent years. However, prices are forecast to decline from 2014/15. In particular, the AEMC's annual price trends report forecasts an 18.5 per cent decrease in retail prices between 2014 and 2016/17, largely due to a forecast 22.9 per cent decrease in network prices and removal of the carbon price in the same period.[40] Consistent with this forecast, retail prices have begun to fall in the first two quarters of 2014/15, as shown in Figure 5.1.

Figure 5.1: Sydney retail electricity price (real index)



Source: HoustonKemp analysis of ABS, Consumer Price Index Australia – Table 11, 2014

Retail electricity prices are forecast to decline due to a number of trends affecting the cost components of the final retail price including:

- the repeal of the carbon price;

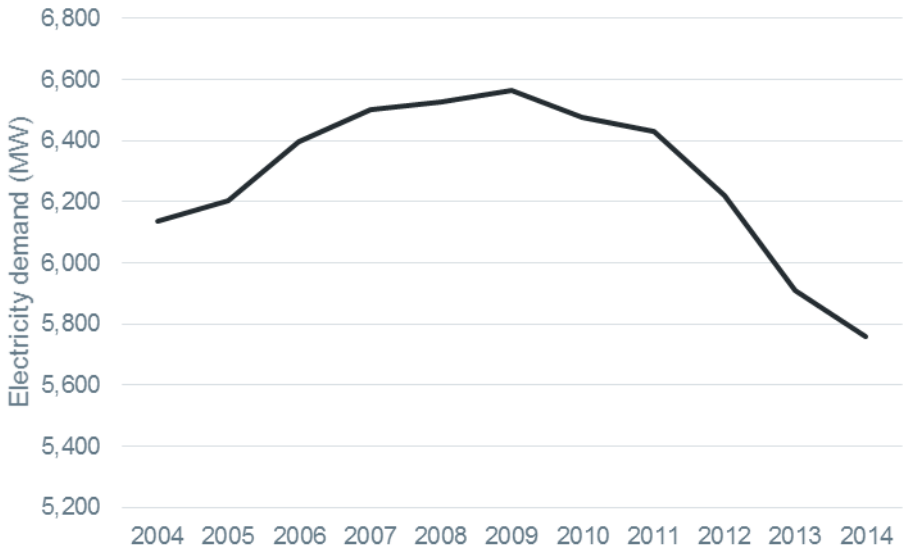
[40] AEMC, *2014 Residential Electricity Price Trends Report*, December 2014, p. 36.

- falling demand for electricity;
- downward pressure on network costs; and
- developments in retail electricity competition.

The **repeal of the carbon price** removed a significant cost on coal-powered electricity generation, which at an historical low still contributed 73.6 per cent of electricity output to the NEM in 2013/14.[41] The repeal also prompted plans to return coal-fired plants to generation[42], which may place further downward pressure on wholesale electricity prices by enabling cheaper base load generation.

The **falling demand for electricity**, as shown in Figure 5.2, has largely been a result of subdued economic growth, the increasing energy efficiency of electrical appliances and the growth in decentralised generation technologies such as solar PV; trends that are expected to continue.[43] This has led to excess generation capacity across the NEM, and the resulting over supply is putting downward pressure on wholesale electricity prices.[44]

Figure 5.2: Annual average electricity demand for NSW



Source: HoustonKemp analysis of information provided by the Australian Energy Market Operator

The **downward pressure on network costs** is also the product of falling electricity demand, which is reducing the need for network expansion. In addition lower financing costs, subdued because interest rates and risk premiums are now materially lower than at the time of the last regulatory determination in 2009, are lowering the required return on capital. The AER has explained that these are the key reasons for limiting the revenue that NSW electricity service providers can recover from downstream customers during the 2015/16-2019/20 regulatory period. As such, the AER has determined in its draft decisions for the NSW service providers a reduction in:

- Ausgrid's proposed recoverable return by 35 per cent, reflecting system peak demand decreases of 1.13 per cent per annum over the previous regulatory period. If passed on to retail customers this would equate to a reduction in an average residential customer's bill of $189;[45]

[41] AER, *State of the energy market report*, 2014, p. 31.

[42] AER, *State of the energy market report*, 2014, p. 6.

[43] AER, *State of the energy market report*, 2014, p. 5.

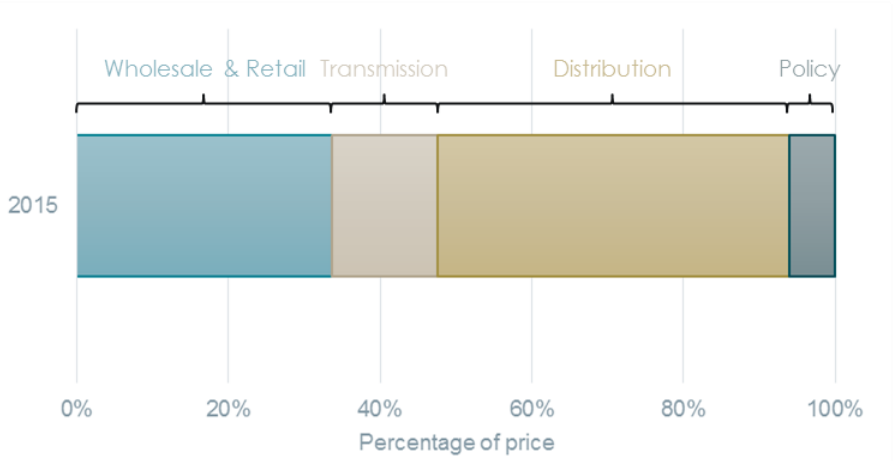
[44] AEMC, *2014 Residential Electricity Price Trends Report*, December 2014, p. iii.

[45] AER, *Draft decision – Ausgrid distribution determination 2015-16 to 2018-19*, November 2014, p. 9-10.

- Endeavour Energy's proposed recoverable return by 29.5 per cent, which if passed on would equate to a reduction in an average residential customer's bill of $159;[46] and
- Essential Energy's proposed recoverable return by 33.9 per cent, reflecting system peak demand decreases of 1.13 per cent per annum over the previous regulatory period. If passed on this would equate to a reduction of an average residential customer's bill of $346.[47]

Should these draft decisions be reflected in the AER's final determination it will place considerable downward pressure on distribution prices, which contribute half of retail electricity costs (see Figure 5.3).

Figure 5.3: NSW retail electricity price by contributing cost components, 2014/15



Source: HoustonKemp analysis of AEMC, 2014 Residential Electricity Price Trends Report, *2014*

Developments in retail electricity market competition has led the AEMC to the conclusion that competition was sufficiently robust for it to recommend removing retail price regulation.[48] The AEMC further concluded that retailers have had to compete more actively to attract and retain customers by providing greater discounts. In addition, an emerging trend in the provision of alternative retail price structures allows consumers to lower electricity bills by choosing when and how they consume electricity.[49]

[46] AER, *Draft decision – Endeavour Energy distribution determination 2015-16 to 2018-19*, November 2014, p. 9.

[47] AER, *Draft decision – Essential Energy distribution determination 2015-16 to 2018-19*, November 2014, p. 9-10.

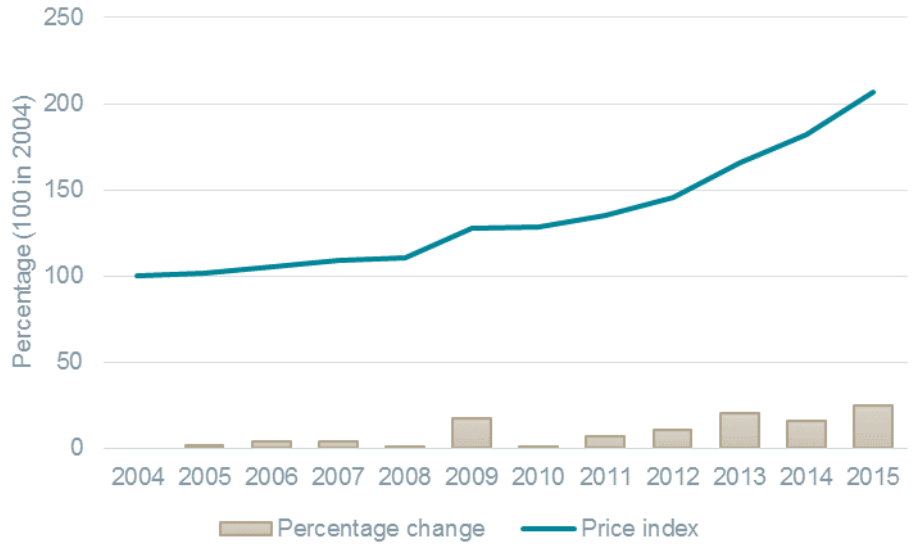
[48] AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, October 2013, p. i.

[49] AER, *State of the energy market report*, 2014, p. 4.

5.2 Retail gas prices are rising

Retail gas prices have been rising moderately in recent years, as shown in Figure 5.4 below. However, as gas liquefaction facilities in Queensland come online, the ability to export LNG will cause a considerable rise in international demand for Australian gas. This will result in the east coast domestic wholesale price rising to parity with the netback price available to producers through exports, in order to compete with international demand.[50] A similar dynamic has been observed in the West Australian gas market, where it is acknowledged that historical increases in LNG exports have placed upward pressure on domestic contract prices.[51]

Figure 5.4: Sydney retail gas price (real index)



Source: HoustonKemp analysis of ABS, Consumer Price Index Australia – Table 11, 2014

These trends are reflected in recent forecasts of the wholesale gas price. Forecasts collected by the Grattan Institute indicate that this price is likely to double by the end of the decade.[52] This will put substantial upward pressure on the retail gas price because the wholesale price comprises a significant portion of a customer's retail bill – see Figure 2.2. Consistent with these forecasts, Figure 5.4 shows an acceleration in gas price increases since 2012.

The increase in the wholesale price will put pressure on gas network businesses such as JGN to reduce their prices as we discuss in section 6.1 below.

[50] LNG netback prices simulate an export parity price by stripping out shipping, transportation and liquefaction costs.

[51] Gratton Institute, *Getting gas right – Australia's energy challenge*, June 2013, p. 36.

[52] Gratton Institute, *Getting gas right – Australia's energy challenge*, June 2013, p. 9.

5.3 Moves to align electricity tariff structures with costs affect the attractiveness of gas relative to electricity

Falling electricity demand and escalating cost pressures over the past decade has brought into sharp focus the disconnection between electricity tariff structures and the costs incurred to supply electricity. The prevalence of usage based tariffs combined with falling electricity consumption means that revenue has been falling by more than costs, which are largely independent of electricity usage. This has led to recent changes to the network pricing principles by the AEMC to facilitate a transition to more efficient network tariffs that more closely signal to consumers the costs incurred from the manner in which they consume electricity, not just the amount.[53]

In practical terms, this will likely mean that there will be less of a focus on recovering revenue from usage based charges, with more revenue being recovered through charges based on a consumer's contribution to network peak demand for electricity (which is a key driver of network costs).

One implication would be that the cost of using electricity during off-peak periods will likely be lower (and potentially significantly lower). This will have the effect of making electricity more cost effective compared with gas for dual fuel customers. One might expect that some customers would choose to make greater use of reverse cycle air-conditioning over gas space heating during the off-peak or outside the maximum demand charging window, if the price differential becomes such that it becomes more cost effective to switch between fuel sources.

In summary, as the gap widens between the cost effectiveness of electricity and gas tariff structures in NSW, the incentives for a consumer to switch between fuels are likely to favour electricity as the fuel with the more efficient tariff.

5.4 Summary

The profound changes to energy markets in NSW are resulting in a reduction in the historic cost advantage for gas. There is increasing recognition of this by regulators in Australia. For example, the AER recently stated that:[54]

> [ActewAGL's consumption] forecasts do not account for trends in customers switching from entirely electricity-based consumption to electricity and gas-based consumption. By excluding this from the analysis, ActewAGL are implicitly assuming that the historical trend will continue over the forecast period. However, with developments in the gas market, and recent gas price rises, we would not expect this to be the case. [Emphasis added]

While in recent demand forecasting commissioned by AEMO, ACIL Allen noted:[55]

> Increasing gas costs to businesses over the next few years – the likes of which have not been experienced before – are likely to reveal the underlying elasticity of demand for gas and also the cross-elasticity of substitute products (such as coal for steam raising in industrial settings or reverse cycle air conditioning for heating purposes within households). Forecasts which rely on historical relationships are likely to over-estimate gas consumption as households and business make consumption and equipment decisions based on substantially altered financial trade-offs. [Emphasis added]

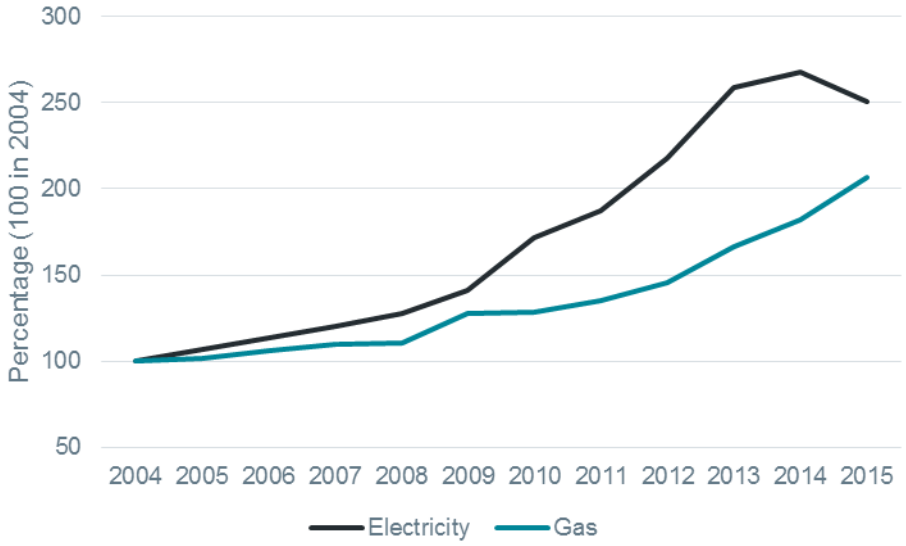
[53] AER, *State of the energy market report*, 2014, p. 76

[54] AER, *AER draft decision – ActewAGL 2014-15 to 2018-19 regulatory control period*, November 2014, Attachment 6 p. 6-91.

[55] ACIL Allen Consulting, *Report to Australian Energy Market Operator – Gas Consumption Forecasting*, June 2014, p. A-3.

Figure 5.5 shows that the price of electricity rose significantly faster than the price for gas from 2004 to 2012. However, this is now reversing, indeed the price of gas has increased by 28.7 per cent relative to electricity from FY2013 to the second quarter of FY2015. Retail electricity prices are forecast to fall further, whilst the wholesale element of retail gas prices is forecast to rise.

Figure 5.5: Sydney retail gas and electric prices (real index)



Source: HoustonKemp analysis of ABS, Consumer Price Index Australia – Table 11, 2014

6. Implications for the Regulatory Approach of Increasing Competition in the Consumer Energy Market

The rapid growth of opportunities for substitution from gas to alternative energy sources creates further constraints on JGN's ability to exercise market power, and so raises the prospect that consumers might be better off from more light handed forms of regulation. Irrespective of a formal application to the NCC to change the prevailing regulatory framework, changes to the incentives faced by JGN are relevant to how the AER approaches its regulatory task.

This section sets out the implications of increasing competition in the consumer energy market for:

- the behaviour of JGN, in the way it sets its prices, plans its expenditure and offers services; and
- the regulatory approach adopted by the AER for JGN's proposed gas access arrangement for the period 1 July 2015 to 30 June 2020.

6.1 JGN is increasingly subject to competitive pressure

We have outlined earlier that retail gas customers are faced with increasing opportunities for substitution from gas to alternative energy sources, as a consequence of changes in technology and relative prices, amongst other factors. This section outlines the implications for JGN of these increasing opportunities.

6.1.1 The constraint on JGN's scope to exercise market power is significant

Network charges are approximately half of the retail gas bill

For gas to be competitive with electricity there is a need to consider the opportunity to save costs across the entire gas supply chain. However:

- wholesale gas prices are being affected by global factors, and so there is little incentive for wholesale gas suppliers to lower prices to increase gas sales domestically;
- retailing costs are only 20 per cent of the total cost to supply gas to consumers; and so
- the greatest opportunity for maintaining a competitive advantage is by lowering gas network costs and managing the timing of cost recovery amid other supply chain developments.

Gas network charges are approximately half of the total cost to supply gas to consumers and so JGN is able to have a material impact on the substitution between gas and electricity through its investment and pricing. Therefore, it has a strong incentive to undertake strategies that assist with retail gas competing against electricity.

A large part of JGN's revenues are at stake

Sections 4 and 5 describe the changes in availability of alternatives to technologies using gas, and the relative price of gas versus electricity for volume market customers, and in particular residential customers. JGN earns the majority of its revenue from residential uses, and in particular, hot water and space heating.[56] As such, the incentive to provide better services and lower prices will be strong for JGN.

Gas used for hot water is the most important part of the residential sector for JGN and there has been significant growth in the availability of alternatives to gas hot water as described in section 4.2.1. JGN has

[56] See section 3.2.

recognised this competitive threat in its recent pricing proposal. It explained that it was proposing changes to its prices to ensure gas remains a competitive way to provide hot water or heat homes across NSW.[57]

Finally, under prevailing gas tariff structures, shifts from using gas to electricity for residential hot water can have a flow on effect to the use of gas for other residential users (ie, cooking and space heating), given the need for the consumer to pay the same fixed charge irrespective of the amount of gas consumed. This means that changes in technology or other factors influencing gas consumption for part of consumer uses can make other gas uses even less cost effective compared with electricity.

The recent changes are significant

The change identified in sections 4 and 5 are significant. For example:

- many more people are switching between gas and electricity providers – the rates of switching electricity and gas providers have more than doubled from 2009 to 2013;[58]
- 2.5 per cent of NSW households used solar hot water from 2002 to 2008, with that figure rising to around 8.5 per cent in 2014; and
- the real Sydney retail gas price index has increased by 28.7 per cent relative to electricity from FY2013 to the second quarter of FY2015.

In light of the changes occurring across the energy supply chains for both electricity and gas, we would expect that many of these trends will continue into the future.

Overall, these factors combine to suggest that the constraint on JGN's ability to exercise market power is most likely higher than it has historically been, absent the regulatory framework.

6.1.2 Competitive pressure will provide incentives for JGN to provide better services at lower costs

There are two principal risks to JGN from not remaining competitive under the current regulatory framework:

- a loss of customers from gas to electricity would result in JGN having to recover the same costs over a smaller set of customers. This would increase prices for the remaining customers, leading to further switching to electricity, and further price rises for JGN's remaining customers. This leads to a spiral of a loss of customers and higher prices until there is no prospect of JGN recovering its costs; and
- a loss of customers may result in a cost to JGN from assets being declared redundant and being removed from its capital base if usage falls sufficiently.[59] This may involve a sharing of costs between the service provider and users.[60]

These risks create pressure on JGN to try and prevent existing customers disconnecting from the network, and to attract new customers by:

- providing good quality services that customers value;
- setting prices in a manner that encourages efficient use of the network;
- keeping prices down; and therefore
- keeping costs down too.

In this way, JGN has an incentive to operate and invest efficiently and so competitive pressures absent the regulatory framework will increasingly align its incentives with the long-term interests of consumers, as expressed in the national gas objective.

[57] JGN, *Our proposed network prices – Fact sheet*, June 2014, p. 6.

[58] AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, October 2013, p. 18 and 42.

[59] National Gas Rules 85(1).

[60] National Gas Rules 85(3).

6.2 Implications for the AER approach to regulation

We explained in section 2 that the competitive process will deliver the most efficient outcomes for consumers when that process is able to work effectively. Regulation is only required to the extent that the competitive process does not work effectively to provide incentives for efficiency. The use of regulation when it is not required to promote efficient outcomes may lead to:

- unnecessary administrative costs being imposed on the regulated business and the regulator, which are borne by customers;
- an inability for the regulated firm to provide services that customers value and would be willing to pay for;
- a reduction in innovation by the regulated business because it is less able to react quickly to customer needs by providing different products or services that better meet those needs; and
- a failure to promote efficient use of gas networks.

Greater competition between gas and electricity in NSW raises the prospect that the balance between the costs of regulation and scope for inefficiencies from the exercise of market power might tip in favour of light-handed forms of regulation for gas distribution services. Given this prospect, the long-term interests of consumers would be promoted by the AER approaching its current regulatory task differently to its approach to electricity network service providers, where competition with alternative non-network energy sources is likely to have less of an effect on the scope for these businesses to exercise market power.

In practice this should involve:

- acknowledging and explicitly taking into account the incentives for cost and price efficiency arising from increasing opportunities for substitution between gas and electricity by exercising caution in its use of regulatory discretion, so as to minimise the scope for regulatory errors and associated inefficiencies; and
- the AER applying a stronger presumption that the regulatory proposal reflects efficient costs and promotes efficient use of the network.

Indeed a good example of the AER not presuming that JGN's regulatory proposal promotes efficient use of the network arose as part of the draft decision. JGN had proposed a smoothed network revenue path involving real year-on-year price reductions to partially counter anticipated increases in wholesale gas prices, so as to minimise the change in end-retail prices over the regulatory period. We understand that this proposal arose from JGN's customer engagement, and importantly JGN is ultimately indifferent to the path given in net present value terms because the value of each path is the same.

However, despite the incentives on JGN to promote the efficient use of its network, to assist its customers to compete in the energy market, and despite information provided through its customer engagement, the AER proposed in its draft decision to not accept JGN's proposed revenue path. Instead it has proposed a large initial decrease in prices, followed by small increases in subsequent years.

Given the incentives on JGN the AER's decision is inconsistent with a regulatory approach that applies a strong presumption that the regulatory proposal reflects efficient costs and promotes efficient use of the network.

Our conclusion is consistent with the actions of other regulators in Australia to reduce the extent of regulation for gas distribution businesses. For example, the NCC has recently approved a request by Envestra to remove coverage from its Queensland Gas Distribution Network (QGDN) and use light handed regulation instead.[61] The NCC said in making its final decision that the most significant constraint on market power associated with the QGDN is the ability for end users to substitute between other forms of energy ie, electricity and LPG with gas from the distributed network.

[61] NCC, *Light Regulation of Envestra's QGDN – Final determination*, November 2014, p. 18.

Overall, the risk in the short term of regulatory expenditure allowances being below efficient levels affects the ability of a regulated business to continue to provide the quality of network services desired by consumers. In the longer term, it can affect incentives for efficient investment in the network to provide services that might otherwise be valued by consumers.

A1. Small-Scale Technology Certificate Case Studies

A1.1 Hot water STC case studies

This section provides a case study that calculates the value of STCs created when a representative NSW household installs a renewable hot water technology. For the purposes of this case study we assume a representative household of four persons, and a certificate price of $40/STC, consistent with the Government guaranteed price for a seller using the Clean Energy Regulator's (the CER) STC Clearing House.

The amount of STCs created by an installation is equal to the MWh of electricity the system will generate (or displace) over the course of its lifetime, which for hot water systems is given by the CER at 10 years. The calculation therefore requires identification of the system installed and the level of solar radiation, designated by the household's postcode zone.[62]

To identify the system a representative household would install we make use of the following information:

- Solarhart is the largest solar hot water brand in Australia, with 37 per cent of national supply, while Rheem is the largest heat pump brand with 32 per cent of national supply;[63]
- the average hot water system tank size in NSW is 264L, while nationally tanks for heat pump systems are on average the largest at 297L;[64] and
- in NSW the preferred solar system is split system and electric boosted,[65] while the preferred location for a tank is outside.[66]

In addition, all of NSW is in solar hot water postcode zone 3 and the majority is in heat pump postcode zone 3, with the exceptions being high altitude areas around Armadale and the ACT that are in zone 5.[67] On the basis of this information, we select for the purposes of this case study:

- the Solarhart Streamline 272MLV Electric boost solar water heater (split system, electric boosted, 270L tank) that will create 28 STCs, worth $1,120; and
- the Rheem MPi-325 heat pump hot water system (electric boosted, outside 325L tank) that will create 27 STCs, worth $1,080.

The average price payed nationally for a solar hot water system including installation is $3,109, and for a heat pump is $2,209.[68] This indicates that the average customer in NSW can expect to receive a significant upfront rebate of roughly a third of their solar water heater installation cost, or half their heat pump installation cost.

A1.2 Solar PV case study

This section provides a case study that calculates the value of STCs created when a representative NSW household installs a solar PV system. For the purposes of this case study we assume a certificate price of

[62] For the purposes of this exercise we have assumed a price of $40/STC, consistent with the Government-guaranteed price for a seller using the Clean Energy Regulator's STC Clearing House.

[63] BIS Shrapnel, *Solar Hot Water Systems Report*, July 2014, p. 37.

[64] Ibid, p. 11.

[65] Ibid, p. 14.

[66] Ibid, p. 12.

[67] Clean Energy Regulator, *Register of Solar Water Heaters – Postcode Zones (version 2)*, May 2014.

[68] BIS Shrapnel, *Solar Hot Water Systems Report*, July 2014, p. 30.

$40/STC, consistent with the Government guaranteed price for a seller using the CER's STC Clearing House.

The amount of STCs created by an installation is equal to the megawatt hours of electricity the system will generate over the course of its lifetime, which for solar PV systems is given by the CER at 15 years. The calculation therefore requires identification of the power output of the chosen system and the level of solar radiation, designated by the household's postcode zone.

To identify the system a representative household would install we make the standard assumption of a four person household choosing to install a medium sized 2.5kW solar PV system.[69]

In addition, NSW ranges between solar PV system postcode zone 2 and zone 4, though the majority of the state including Sydney is located in zone 3.[70] We therefore chose a household in zone 3 for the purposes of this case study.

On the basis of this information a representative household will create 51 STCs on installation of a solar PV system, worth $2,040.[71]

[69] NERA, *Efficiency of Tariffs for Current and Emerging Technologies*, July 2014, p. 22

[70] Clean Energy Regulator, *Postcode zone ratings and postcode zones for solar (photovoltaic) systems*, accessed January 2015, accessible at: http://ret.cleanenergyregulator.gov.au/Solar-Panels/incentives-solar-panels

[71] For the purposes of this exercise we have assumed a price of $40/STC, consistent with the Government-guaranteed price for a seller using the Clean Energy Regulator's STC Clearing House.

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