

OUR GAS CHALLENGE

THE ROLE OF GAS IN VICTORIAN HOUSEHOLDS

August 2014





An appropriate citation for this report is:

CUAC (2014) *Our Gas Challenge: The role of gas in Victorian households*,
Consumer Utilities Advocacy Centre Ltd, Melbourne

Consumer Utilities Advocacy Centre Ltd (CUAC)

Level 2, 172 Flinders Street

Melbourne VIC 3000

P (03) 9639 7600

F (03) 9639 8966

www.cuac.org.au

ACN 100 188 752

Our Gas Challenge: The role of gas in Victorian households

Contents

List of Tables and Figures	ii
Abbreviations	ii
Executive summary	iii
1. Introduction.....	1
2. A brief history of gas in Victoria.....	2
3. How many households use gas?	3
By connection.....	3
By region.....	4
By income.....	5
By tenure and dwelling type	5
4. How much gas do Victorians use?	8
5. For what purpose do households use gas?	11
Heating	11
Cooking	12
Hot water	13
6. How much do households spend on gas?	15
Proportional expenditure	16
Concessions	16
Effects on households	17
7. Gas expansion in regional Victoria	19
8. Policy implications and recommendations.....	20
9. Bibliography.....	25

List of Tables and Figures

Table 1: Energy sources used in Victorian Households, 2012	3
Table 2: Sources of gas used in Victorian households by equivalised household income, 2011	5
Table 3: Source of gas used in Victorian households by tenure, 2011	6
Table 4: Source of gas used in Victorian households by dwelling type, 2011	6
Table 5: Residential main gas penetration and usage for selected states, 2010-11	8
Table 6: Australian weekly gas usage and income by equivalised disposable income quintile, 2012..	9
Table 7: Main reason for choice of heater, 2011	12
Table 8: Estimated average yearly household expenditure on energy, Victoria, 2012 (in 2014 dollars) for households using that energy source	15
Table 9: Average yearly household expenditure on energy in dwellings by energy source(s) used in dwelling, Victoria, 2012 (in 2014 dollars).....	16
Figure 1: Penetration rates of mains gas and LPG/bottled gas by Labour Force Region, 2011	4
Figure 2: Victorian gas distribution businesses supply area boundaries, 2009	4
Figure 3: Average annual mains gas usage for AGL customers by state and tertile, 2012 (GJ/a).....	8
Figure 4: Victorian residential natural gas use by year, level vs. change	10
Figure 5: Residential energy consumption by type and end use, Victoria, 2005.....	11
Figure 6: Proportion of kitchen appliances fuelled by mains gas, 2011	12
Figure 7: Hot water systems by type, Victoria, 2012	13

Abbreviations

ABS	Australian Bureau of Statistics
COAG	Council of Australian Governments
CPI	Consumer Price Index
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CUAC	Consumer Utilities Advocacy Centre
DEWHA	Department of the Environment, Water, Heritage and the Arts
GFCV	Gas and Fuel Corporation Victoria
GJ	Gigajoule. One GJ = 1,000 MJ
IPART	Independent Pricing and Regulatory Tribunal
LPG	Liquefied Petroleum Gas
MJ	Megajoule
PJ	Petajoule. One PJ = 1,000,000 GJ
URG	Utility Relief Grant

Executive summary

Natural gas in Victoria is the main source of energy for residential heating, cooking, and hot water. Our use of gas has been built on a history of plentiful supply and relatively low and stable prices. However, as explored in CUAC's 2013 report, *Making the Gas Connection*, the construction of export facilities in Queensland will link Australia's eastern gas market to the international market for the first time, making wholesale gas prices both higher and more volatile.¹

Higher wholesale prices will flow on to higher retail prices – and as the biggest residential users of gas in Australia, Victorians households will be more affected than households in any other state. Many are unprepared for price increases.

Our Gas Challenge brings together the most comprehensive and current information about Victorian residential use of gas published at the time of writing. Section 1 introduces the report, and Section 2 provides a brief history of gas in Victoria. Section 3 details the number of Victorian households using gas, what type of gas they use, where they use it, and differences in consumption by tenancy, income, and dwelling type. Section 4 examines how much gas Victorians use, and Section 5 what for. Section 6 explores how much Victorians spend on gas and what concessions are available, while Section 7 looks at gas expansion in regional Victoria. Finally, Section 8 analyses the implications of the information for policy makers and identifies key areas to address.

While consumers have focussed on rising electricity prices, retail gas prices have risen 66% since 2008. The average Victorian household spends around \$1,200 per year on gas, and retail prices are expected to rise by 24% by 2015.² Increases in average gas bills of \$300 per year may find many unprepared, in particular, low income and vulnerable households, renters, and social housing tenants.

The effects will be felt widely: over 90% of Victorian households have either a mains gas connection or use liquefied petroleum gas (LPG) or bottled gas. Close to two million households will face higher prices and higher bills, across income levels and regions.³ Victorians use, on average, twice as much gas as any other state; a middle usage Victorian household consumes more gas than a high usage household in any other state.⁴

The largest source of residential gas consumption in Victoria is heating. Around seven of ten Victorian households heat their homes with gas, and Victorian heating consumption is much larger than other states. This is not only because of the cooler climate, but also because many more Victorians have central ducted gas heating (and therefore heat more of their homes).⁵

The next largest use of gas is for hot water; 80% of households with mains gas have gas hot water, but LPG/bottled gas hot water is uncommon. Cooking contributes only 3-4% to annual household gas usage.⁶ Forthcoming research suggests that, for most Victorians, high efficiency electric appliances are

¹ CUAC (2013)

² See Section 6

³ See Section 3

⁴ See Section 4

⁵ See Section 5

⁶ See Section 5

cheaper than their gas alternatives over the life cycle of the appliance. Households with only one gas appliance could save money by leaving the gas network altogether.⁷

The bulk of the increase in households' bills will occur in winter, as heater usage spikes; this 'lumpiness' can be problematic for households with little discretionary income to absorb bill fluctuations, such as for low income households or those on tight budgets, and result in 'bill shock'.

Additionally, households on low incomes and/or on government pensions and allowances spend several multiples more on gas and energy generally than average households, and are thus more susceptible to problems from higher gas bills. Their capacity to cut back on other expenditure to pay energy bills is lower, and the essential nature of energy services means reductions in usage is also limited.

To lower households' gas bills, the Government's Regional Growth Fund is subsidising the rollout of mains gas into areas where it would not otherwise be profitable. The Government is carrying up to 80% of projects' costs, and paying up to \$12,000 per property to connect people to mains gas.⁸ It is uncertain whether the Regional Growth Fund is the most appropriate method to deliver the intended benefits to regional households in light of rising gas prices.

Consumers are not sufficiently aware of the rising price trajectory of gas or its implications for them. The Victorian Government needs to address this issue as a priority. The role of gas as a continuing cheap alternative to electricity is in doubt, and both consumers and the Government must revisit their attitudes toward gas.

Governments have a role in providing information to consumers to help them make better choices about appliances and gas contracts, encouraging consumers' uptake of energy efficiency measures, and assisting consumers who are vulnerable or face barriers to taking action (e.g. renters, social housing tenants).

Recommended responses include: information and education campaigns; appliance energy and labelling schemes that allow cross-fuel comparisons; research into the relative life cycle costs of electric vs. gas appliances; energy efficiency programs targeting high energy users; re-assessment of current energy schemes and concessions to ensure their appropriateness; and upgrades to housing stock.

⁷ ATA (forthcoming) The Impact of Future Gas Price Increases and Cost Effective Alternatives for Energy Consumers

⁸ See Section 7

1. Introduction

Natural gas in Victoria is the main source of energy for residential cooking, heating, and hot water. However, significant change to the eastern gas market is currently underway: the construction of gas export facilities in Queensland will see the domestic gas market in the eastern and south-eastern states⁹ linked for the first time with international gas markets. This will lead to Australian wholesale gas prices becoming both higher and more volatile.¹⁰

Gas suppliers have already responded by reserving supplies for overseas sale¹¹ or increasing the prices that Australian buyers must pay. Governments and consumers are faced with rising retail gas prices, but most focus has been on rising electricity prices and policies to address these; increases in gas bills may catch many unprepared.

Higher wholesale prices will flow on to higher retail prices – and as the biggest residential users of gas in Australia, Victorians will therefore be more affected than households in any other state.

The Federal Government considers that protecting individual sectors of the Australian market to the detriment of exporters makes no economic sense, and that the states are responsible for resolving problems arising from the internationalisation of gas prices.¹² In this context, consideration of the Victorian situation is vital.

Our Gas Challenge has been written to help key stakeholders in policy decision-making understand how rising retail gas prices will affect Victorians. It provides the most comprehensive and current collection of information about Victorian residential use of gas published at the time of writing. *Our Gas Challenge* is the second in CUAC's series on gas; our 2013 report, *Making the Gas Connection*, provided a high level introduction to the gas sector for consumer and community organisations.

Our Gas Challenge details the number of Victorian households using gas, what type of gas they use, where they use it, and what for. It explores how much Victorians spend on gas, what concessions are available, and differences in consumption by tenancy, income, and dwelling type. Finally, this report analyses the implications of the information for policy makers and identifies key areas to address.

⁹ Queensland, New South Wales, the ACT, South Australia, Victoria, and Tasmania

¹⁰ CUAC (2013)

¹¹ "Swanbank power station to close for three years", The Age, <http://www.theage.com.au/queensland/swanbank-power-station-to-close-for-three-years-20140205-321m6.html>, retrieved 13.02.14

¹² Federal Minister for Industry, Ian Macfarlane, on ABC Background Briefing 03.08.2014

2. A brief history of gas in Victoria

Victoria has a long history of gas usage, beginning in the 1840s when gas lights were introduced to Melbourne. Their widespread use for illumination in Melbourne did not occur until the 1950s, a decade after the Australian Gas Light Company – now AGL Energy – oversaw gas light installation throughout Sydney. Regional Victorian towns adopted gas lighting in the 1860s, with gas cooking following in the 1870s.¹³

The main source of gas during this period until the 1950s was coal, which was gasified in plants across the state to produce ‘coal gas’ or ‘town gas’. The post-World War II policy of refining crude oil at its point of use, rather than point of sale, saw Australian oil refineries established and the gas industry shift to producing ‘syngas’ using oil’s by-products as gas feedstock.¹⁴

The 1960s’ discovery of commercial natural gas and oil reserves in the Bass Strait saw the then Premier of Victoria, Sir Henry Bolte, intervene to secure “benign monopoly rights” for the state-owned Gas and Fuel Corporation of Victoria (GFCV) (Kimber, 2009, p. 7). The GFCV struck a favourable long term pricing contract with Esso/BHP to become the sole transmitter and distributor of natural gas in Victoria.¹⁵

Victoria’s large reserves of natural gas and the actions of the Victorian Government and GFCV (including strong reticence toward interstate exports) led to high levels of penetration in the state, which persist today. Development of gas pipelines in other states led to a network that connects the eastern states from Tasmania to Queensland, as well as South Australia and the ACT.

The GFCV remained in State Government hands until the late 1990s, when the Kennett Government restructured and privatised it (along with the State Electricity Commission). The GFCV was split into a transmission business and three retail/distribution businesses, which were sold to the private sector in 1999.¹⁶ The three current distribution businesses are Envestra, Multinet, and AusNet Services, formerly SP AusNet; Figure 2, below, maps their supply areas.

Gas retailing became contestable in 2002: the three existing – ‘incumbent’ – gas retailers, who were previously limited to selling to customers only in a specific geographic area, were allowed to compete with each other state-wide. New entrants followed, and the market became less concentrated as a result, but the descendants of the three incumbent retailers still control a large majority of the Victorian retail market.¹⁷ There are currently 18 electricity and gas retailers for homes and small businesses.¹⁸

Since 2007, liquefied natural gas (LNG) export terminals have been under construction in Gladstone, Queensland.¹⁹ Drivers for these projects include large reserves of unconventional gas in Queensland (in particular, coal seam gas) and international gas prices high enough to make exporting profitable. Competition with export prices is expected to lead to rising wholesale and retail prices across the eastern gas region,²⁰ with Victorian residential bills to rise by 30% between 2013 and 2015.²¹

¹³ Morse (2000)

¹⁴ Ibid

¹⁵ Access Economics (2001), pp. 9-10

¹⁶ Ibid, p. 23

¹⁷ CUAC (2012), p. 4

¹⁸ <http://yourchoice.vic.gov.au/energy-contracts/choosing-a-retailer>, retrieved 13.08.2014

¹⁹ Lowe (2013), p. 21

²⁰ See *CUAC (2013) Making the Gas Connection* for an overview of these developments

3. How many households use gas?

The estimated residential population of Victoria in 2012 was 5.6 million,²² comprising 2.2 million households;²³ 1.55 million households in Melbourne, and 630,000 households in the rest of the state.²⁴ Around 83% of Victorian households have a mains gas connection, with the penetration rate higher in Melbourne (93%) than in the remainder of the state (62%).²⁵ 13% of Victorian homes have liquefied petroleum gas (LPG) or bottled gas, with lower penetration in Melbourne (10%) than the rest of Victoria (22%).²⁶ Mains gas accounts for around 97% of all gas usage.²⁷

By connection

Mains gas is rarely a household's only fuel: households connected to gas invariably also have an electricity connection. 9% of gas-connected households have electricity, mains gas, and a third or further source of energy (e.g. solar photovoltaic panels, wood heater, diesel generator).²⁸ A further 6% of Victorians aren't connected to mains gas networks, but use LPG or bottled gas in the home. Table 1, below, shows the full breakdown.

Table 1: Energy sources used in Victorian Households, 2012

Fuel source(s)	Melbourne		Balance of State		Victoria	
	%	Households	%	Households	%	Households
Electricity only	5.4%	83,200	9.2%	57,600	6.5%	141,500
Electricity and mains gas only	82.7%	1,280,600	56.9%	357,000	75.2%	1,636,700
Electricity, mains gas, and other	8.9%	137,900	5.1%	32,000	7.8%	169,800
Electricity and LPG/bottled gas only	see notes		8.1%	50,800	2.7%	58,800
Electricity, LPG/bottled gas and other	0.7%^	11,600^	9.5%	59,400	3.3%	71,800
Electricity and other	1.2%^	18,400^	11.2%	70,100	4.1%	89,200
All Households	100%	1,548,900	100%	627,500	100%	2,176,500

^ Estimate has a relative standard error (RSE) of 25-50% and should be used with caution. The estimate of LPG/bottled gas penetration in Melbourne has an RSE of greater than 50% and the ABS considers it too unreliable for general use. Source: ABS (2013a), Table 19 and ABS (2014b), Table 19B, Table 19C. Note that households with both mains gas and LPG/bottled gas are excluded from these totals, but that these make up no more than 0.4% of households.

The proportion of Victorians using LPG/bottled gas is at a recent low, having previously risen from 7.4% in 2005 to 10.6% in 2011.²⁹

²¹ Victorian Gas Market Taskforce (2013), p. 18

²² ABS (2014a)

²³ ABS (2013a), Table 19

²⁴ ABS (2014b), Table 19B, Table 19C

²⁵ See Table 1

²⁶ ABS (2012), Table 1a

²⁷ DEWHA (2008), Table 128

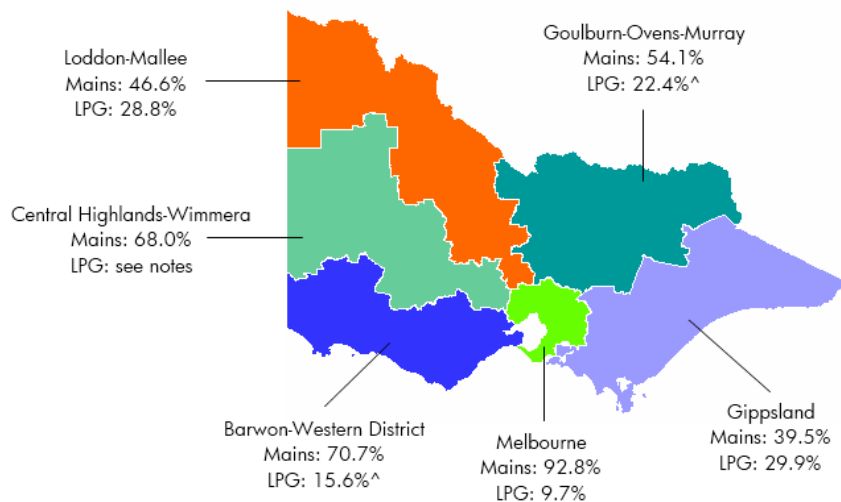
²⁸ ABS (2013a), Table 19

²⁹ ABS (2011b), Table 7

By region

Within Melbourne, mains gas penetration rates range from 87-88% of households in inner and south-eastern Melbourne to 96% in inner-eastern Melbourne.³⁰ Penetration rates in the Barwon region, Western Districts, Central Highlands, and Wimmera region are the highest in non-metropolitan Victoria, at 68-71%, while the Goulburn-Murray, Loddon-Mallee, and Gippsland regions have mains gas penetration rates of 54%, 47%, and 40%, respectively.³¹

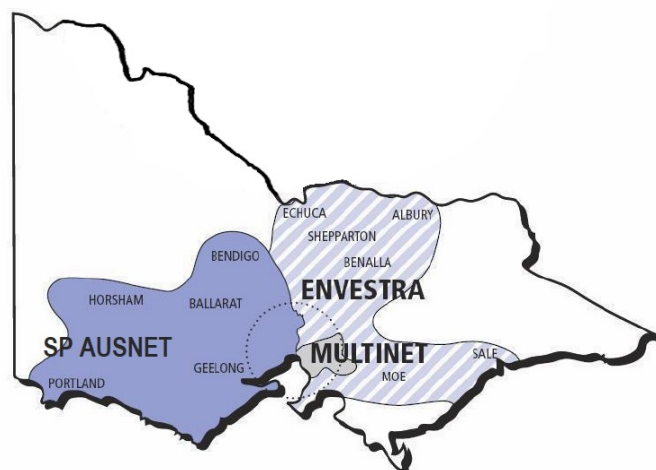
Figure 1: Penetration rates of mains gas and LPG/bottled gas by Labour Force Region, 2011



^ LPG/bottled gas estimates for Barwon-Western District and Goulburn-Ovens-Murray have a relative standard error of 25-50% and should be used with caution. The estimate of LPG/bottled gas penetration in the Central Highlands-Wimmera region has a relative standard error of greater than 50% and the ABS considers it too unreliable for general use. Source: CUAC, using image from <http://lmip.gov.au>, statistics from ABS (2012), Table 2a.

Penetration rates of mains gas across Victoria are highly influenced by the coverage of the mains gas distribution network, shown in Figure 2.

Figure 2: Victorian gas distribution businesses supply area boundaries, 2009



Source: Adapted from <http://www.esc.vic.gov.au/Energy/Distribution/Map-of-Gas-distributors>

³⁰ ABS (2012), Table 2a

³¹ Ibid

The proportion of households using LPG or bottled gas varies roughly inversely with the mains gas penetration rate: 29-30% of households in the Gippsland and Loddon-Mallee regions use LPG or bottled gas, falling to 22% for non-metropolitan Victoria generally and 9.7% in Melbourne.

By income

The relationship between household income and gas penetration is ambiguous. Across the whole of Victoria, the likelihood of a household having a mains gas connection appears to grow as its income does, but this is not consistently true within either Melbourne or the rest of Victoria separately (see Table 2).

Table 2: Sources of gas used in Victorian households by equivalised household income, 2011³²

	Melbourne		Balance of Victoria		Victoria	
	Mains	LPG/Bottled	Mains	LPG/Bottled	Mains	LPG/Bottled
Lowest quintile	90.2%	7.7%	56.9%	23.0%	77.9%	13.3%
Second quintile	94.1%	9.2%	56.2%	19.0%	79.7%	12.9%
Third quintile	93.1%	12.1%	57.3%	20.4%	82.1%	14.6%
Fourth quintile	94.1%	10.6%	55.7%	23.8%	84.9%	13.8%
Highest quintile	92.6%	13.4%	55.9%	26.9%	85.8%	15.9%
All households	92.8%	9.7%	56.4%	21.8%	82.6%	13.0%

Source: ABS (2012), Table 1a.

The relationship between income and LPG/bottled gas penetration is even weaker, with greater fluctuation between income quintiles. It appears difficult to distinguish between households' likelihood of using mains gas or LPG/bottled gas on the basis of income, though levels of usage do tend to increase with income (see Section 6).

By tenure and dwelling type

Whether residences have a gas connection or not differs significantly by whether the occupant is an owner or renter, and what type of dwelling (house or apartment) it is; interestingly, the relationship differs between Melbourne and the rest of Victoria. (See Table 3 and Table 4.)

In Melbourne, dwellings owned outright or being paid off are 5-6 percentage points more likely to have mains gas than rental accommodation. In the rest of Victoria, the opposite is true: rented dwellings are around 12 percentage points more likely to have mains gas than homes owned by, or being paid off by the occupant.

Another notable feature is that separate houses and semi-detached/townhouses in Melbourne are 15 percentage points more likely to have mains gas than flats or apartments, while outside Melbourne semi-detached/townhouses are around 15 percentage points more likely to have mains gas than either separate houses or flats and apartments.

³² Because larger households do not need as many resources as several smaller households (e.g. they share a washing machine, fridge, etc), equivalisation adjusts household income to account for the size of the household. For more information, see <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2901.0Chapter31502011>. Quintiles are fifths.

Table 3: Source of gas used in Victorian households by tenure, 2011

	Melbourne		Balance of Victoria		Victoria	
	Mains	LPG/Bottled	Mains	LPG/Bottled	Mains	LPG/Bottled
Owned outright	94.1%	9.5%	54.7%	22.8%	81.6%	13.7%
Being paid off	95.2%	11.6%	54.6%	23.9%	84.3%	14.9%
Rented ^a	88.8%	6.5%	66.5%	13.5%	83.5%	8.2%
Other ^b	84.7%	14.3%^	31.9%	38.7%	67.8%	22.1%
All households	92.8%	9.7%	56.4%	21.8%	82.6%	13.0%

^a Includes free rent ^b Includes other tenure types, e.g. rent/buy schemes, shared equity schemes, or 'owned but not further defined'. ^ Estimate has a relative standard error of 25-50% and should be used with caution.

Source: ABS (2012), Table 1a.

Table 4: Source of gas used in Victorian households by dwelling type, 2011

	Melbourne		Balance of Victoria		Victoria	
	Mains	LPG/Bottled	Mains	LPG/Bottled	Mains	LPG/Bottled
Separate house	95.6%	10.8%	56.2%	23.3%	82.9%	14.8%
Semi-detached, row or terrace house, townhouse	95.5%	12.1%	71.6%	na ^	93.3%	11.9%
Flat, unit or apartment ^a	80.0%	3.8%	53.5%	8.6%	76.0%	4.5%
All households	92.8%	9.7%	56.4%	21.8%	82.6%	13.0%

^ The estimate of LPG/bottled gas penetration in semi-detached houses, row or terrace houses, and townhouses has a relative standard error of greater than 50% and the ABS considers it too unreliable for general use. ^a Includes 'other'.

Source: ABS (2012), Table 1a.

These observations are related: in Melbourne, renters are less likely to use mains gas than non-renters, in part because renters are relatively more likely to live in flats or apartments, which are less likely to have mains gas. Outside Melbourne, renters are relatively more likely than non-renters to live in semi-detached/townhouses, and these dwellings are more likely to have mains gas than separate houses or flats and apartments, so that renters outside Melbourne are relatively more likely to use mains gas than non-renters.³³

The direction of the relationship is unclear – do renters seek out gas in the country, but not in the city? Do developers consider gas connections more attractive for buyers than renters? This issue requires further investigation and would need to be considered by any policy response targeting particular dwelling or ownership types.

The relationship between LPG/bottled gas penetration and dwelling and ownership type is more consistent across Victoria: residences owned outright or being paid off are more likely to have LPG/bottled connections than rented dwellings in both Melbourne and the rest of the state. Separate and semi-detached/townhouses are also more likely to have LPG/bottled gas than flats or apartments. Why 'Other' dwellings (Table 3) have materially higher rates of LPG connection than other tenure types is unclear.

³³ Tenure and dwelling statistics are from the Tenants Union of Victoria, personal communication, 28.07.2014, based on data from 2011 ABS Census.

Findings

Nine of ten Victorians use natural gas at home, and gas usage is high across all income levels and regions. Rising retail gas prices will affect almost all Victorian households.

97% of usage is mains gas, and usage is concentrated in and around Melbourne. Renters in Melbourne are less likely to have mains gas than homeowners, in part because renters are more likely to live in flats or apartments, which less often have gas connections.

In the rest of Victoria, renters are *more* likely to have mains gas than homeowners. Homeowners across Victoria are more likely to use LPG/bottled gas than renters.

Renters are likely to have greater difficulties responding to rising retail gas prices because their ability to change the energy efficiency of the homes, e.g. by upgrading appliances or installing insulation, is more limited than that of home owners.

4. How much gas do Victorians use?

Victorians are the largest residential users of gas in Australia, both on an individual and state level. Table 5 shows that Victorians use, on average, twice as much gas as the next largest residential consumers of gas, South Australians. This is due to a combination of greater levels of gas penetration and greater usage of gas heating during cooler months, and means rising retail gas prices will affect households' bills more strongly here than in other states.

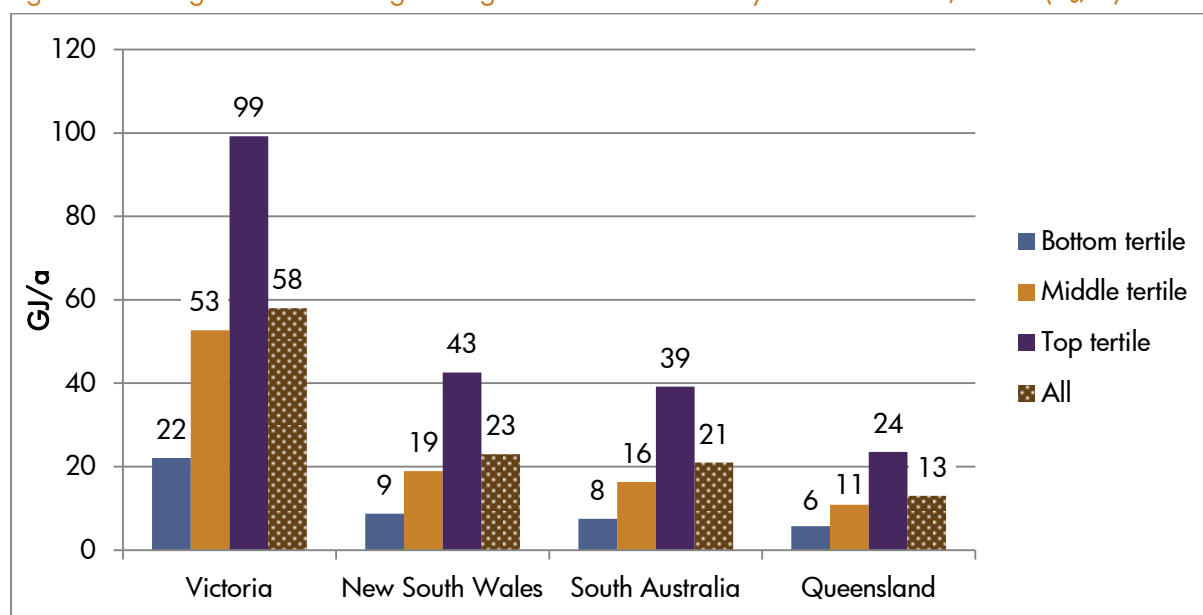
Table 5: Residential main gas penetration and usage for selected states, 2010-11

	Victoria	South Australia	New South Wales	Queensland	Western Australia	Tasmania
Gas penetration rate (state) ^a	81.6%	58.4%	38.9%	10.9%	68.3%	4.4%
Gas penetration rate (capital city) ^a	91.0%	75.2%	47.7%	18.6%	83.9%	6.2%
Gas penetration rate (non-capital) ^a	57.5%	13.7%	25.3%	5.0%	24.5%	3.1%
Annual usage (state) ^b	100.2 PJ	10.7 PJ	24.3 PJ ^d	2.9 PJ	10.0 PJ	0.1 PJ
Average annual household usage ^c	57 GJ	28 GJ	21 GJ ^d	15 GJ	16 GJ	11 GJ

^a ABS (2011b) ^b BREE (2013) ^c Total state usage (BREE, 2013) ÷ number of households with mains gas (ABS, 2011b) ^d Includes ACT

A 'low usage' Victorian household (in the bottom third of mains gas usage) is roughly equivalent to a middle usage household in NSW or a high usage household in Queensland (see Figure 3). A middle usage Victorian household consumes more gas than a high usage household in any other state, and a high usage Victorian household consumes almost twice as much gas as the Victorian average, and five times as much as the east coast average.

Figure 3: Average annual mains gas usage for AGL customers by state and tertile, 2012 (GJ/a)



Source: CUAC calculation, based on Nelson (2012), p. 109. Excludes AGL customers not using gas.

Across Australia, households in the lowest earning 20% (by equivalised disposable income) use 17 percentage points less mains gas than the average household, but the proportion of their income they spend on energy is almost three times as high as the average.³⁴ Mains gas usage increases as incomes do, though not to the same extent: see Table 6. Rising retail gas prices will have a more strongly detrimental effect on lower earning households than they will on higher earning households, compounding the challenges already faced by these groups.

The relative invariance of gas usage with income is in line with its nature as an essential service, rather than a discretionary one; most usage contributes to a minimum standard of living, rather than purely enjoyment. However, this characteristic also means that the services gas provides must remain affordable at all income levels. This is properly a task of government, via policies such as energy concessions. While research has found Victoria to have the most equitable energy concession model on the east coast, the recent adoption of capped concessions means the Government may struggle to adequately, or in sufficient time, adjust caps or thresholds to reflect price increases.³⁵

Table 6: Australian weekly gas usage and income by equivalised disposable income quintile, 2012

	Lowest	Second	Third	Fourth	Highest	Average
Mains Gas	547.9 MJ	610 MJ	690.7 MJ	722.7 MJ	725 MJ	661.9 MJ
% of total average	83%	92%	104%	109%	110%	100%
LPG/bottled gas	175.0 MJ	167.5 MJ	232.5 MJ	170.0 MJ	182.5 MJ	185.0 MJ
% of total average	95%	91%	126%	92%	99%	100%
Median Income	\$381	\$583	\$790	\$1,048	\$1,555	\$790
% of total median	48%	74%	100%	133%	197%	100%

Source: All ABS (2013a), Table 6, except median incomes, which are from ABS (2013b), Table 6.

Interestingly, LPG/bottled gas usage is strongly concentrated in the middle income quintile. Our research has not identified a reason for this.

On a weekly basis, the ABS estimate that households in Melbourne with mains gas use an average of 1,075 MJ per week, while the rest of the state uses 940 MJ per week.³⁶ Melbourne households with LPG or bottled gas use 17.5 L per week, equivalent to around 438 MJ,³⁷ while other Victorian households use 12.5 L (313 MJ).³⁸

Sustainability Victoria estimate a higher, state wide average of around 1,200 MJ per week, fluctuating between around 600 MJ per week from December to April to around 1,600 MJ per week from May to November.³⁹

³⁴ ABS (2014b), Table 6A

³⁵ Johnston (2013), p. 25

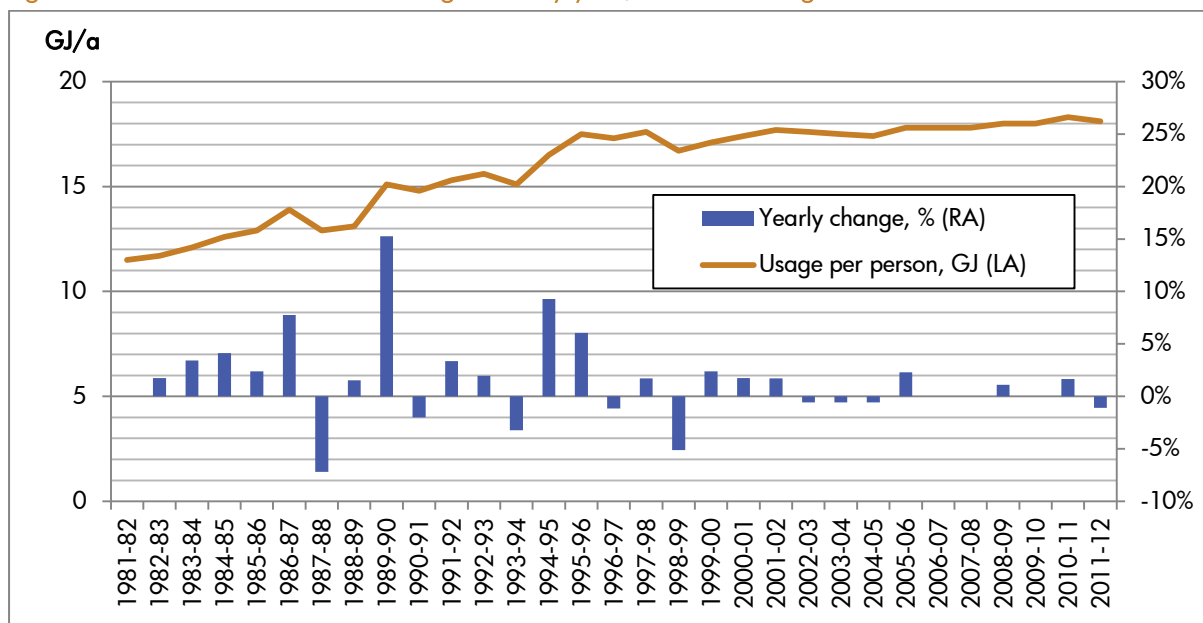
³⁶ ABS (2014b), Table 18B, Table 18C

³⁷ One litre of LPG contains approximately 25 megajoules of energy. Source: www.elgas.com.au

³⁸ ABS (2014b), Table 18B, Table 18C

³⁹ Sustainability Victoria (2014), p. 3

Figure 4: Victorian residential natural gas use by year, level vs. change



Source: CUAC calculations based on BREE (2013). Average usage is per head of population, not per gas user.

Residential usage of mains gas has steadily increased in recent decades, as has average usage per person (shown in Figure 4). A portion of the absolute increase has been due to gas extension programs run by successive Victorian State Governments to regional and rural towns and communities since 2003.⁴⁰ As the mains gas distribution network has expanded, usage of town gas has fallen.^{41, 42}

Findings

Victorians are the largest household users of gas in Australia, by a large margin; only the ACT comes close. A low usage Victorian household uses as much or more gas than the average household in other eastern states, and a high usage Victorian household uses five times that much. Retail gas prices would affect Victorian households much more severely than households in other states.

Households on low incomes use 17% less gas than average households, but spend almost three times as much on energy relative to their incomes. Rising retail gas prices are likely to have a more detrimental effect on these households than others.

Gas usage per household has steadily grown over time, in part due to government programs.

⁴⁰ See Regional Development Victoria (2012)

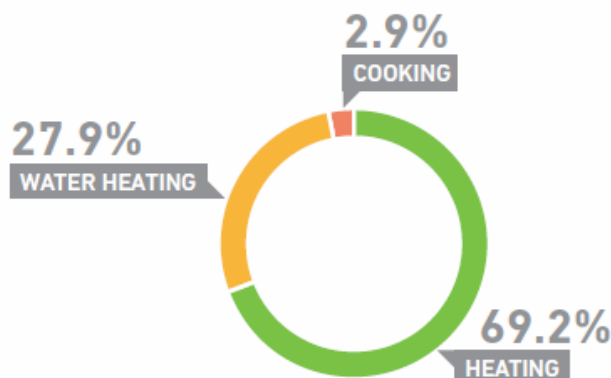
⁴¹ BREE (2013)

⁴² 'Town gas' is gas locally produced from coal or other materials. It is also often referred to as 'coal gas'.

5. For what purpose do households use gas?

The three main purposes for which households use gas are space heating (henceforth ‘heating’), cooking, and hot water, with heating being the largest contributor to total consumption – see Figure 5.

Figure 5: Breakdown of the average gas bill in Victorian households, 2014



Source: Sustainability Victoria (2014), Figure 2

Heating

Heating is the largest source of residential gas consumption in Victoria, and most Victorians heat their homes with gas. 68.5% of Victorians used gas – either mains or LPG/bottled gas – as their main source of energy for heating in 2011, down slightly from 71.2% in 2005. The replacement fuel source has been electricity, which has risen from 14.7% to 18.8% over the same period as the main source of heating energy.⁴³

Victorians are arguably the biggest heater-users in Australia. The highest heating energy consumption in Australia occurs in Victoria and Tasmania, where similar amounts of heating energy are used per household. However, as the Victorian climate is warmer than Tasmania’s, Victorian heating requirements should be lower;⁴⁴ indeed, Victorians tend to heat for fewer months of the year than Tasmanians (though more than other states).⁴⁵

The Department of the Environment, Water, Heritage and the Arts (DEWHA, 2008, p. 42) attribute this “anomaly” to Victorians generally demanding higher standards of heating and being more used to ‘whole house’ heating solutions than Tasmanians: over 40% of Victorian households in 2007 use central ducted gas heating,⁴⁶ while such systems are almost non-existent in Tasmania and the alternatives – electric and wood heaters – heat fewer rooms.

The ABS (2014b) estimate that 43% of Victorian households had gas ducted heating in 2012;⁴⁷ aside from the ACT, which has a similar proportion, no other state has gas ducted heating in more than 4% of households.⁴⁸ A further 20% of Victorian households have wall-mounted gas heaters.⁴⁹

⁴³ ABS (2011b), Table 13

⁴⁴ DEWHA (2008), p. 42

⁴⁵ ABS (2011a), Table 9

⁴⁶ DEWHA (2008), p. 42

⁴⁷ ABS, personal communication, 05.06.2014, based on data from ABS (2014b), Table 24A

⁴⁸ ABS (2011a), Table 8

Interestingly, the reasons given by Australians for purchasing different heater types suggest that electric and reverse cycle heaters are relatively more often chosen because they are seen to provide superior comfort or convenience, while gas heaters are relatively more often chosen because they are believed to be more energy efficient or reduce energy costs (see Table 7).

Table 7: Main reason for choice of heater, 2011

	Gas	Electric	Reverse cycle ^a
Cost/price	23.3%	24.4%	15.1%
Save on energy bills	13.0%	4.8%	7.1%
Use less energy/efficiency	17.2%	8.8%	14.5%
Comfort/convenience	36.7%	45.2%	51.7%

^a Reverse cycle includes both gas and electric reverse cycle.

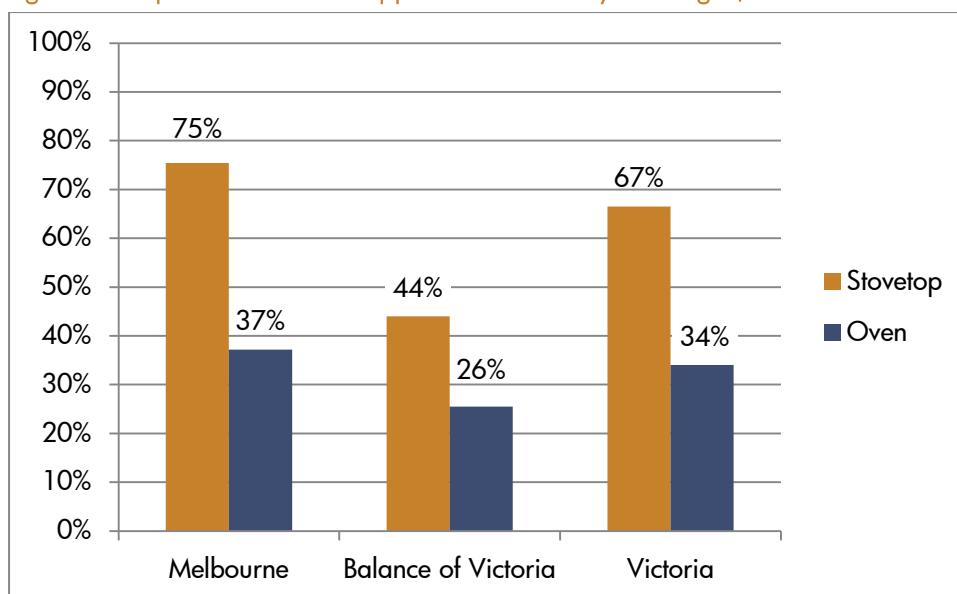
Source: ABS (2011b), Table 14. Households responsible for installing heater and with at least one heater in use.

Cooking

Given the greater convenience of gas stoves versus electric stoves, gas stoves are very common in Victoria, approaching the levels of overall gas penetration (see Figure 6). Gas ovens used to make up 50% of installed ovens, but have been replaced as the most popular form by electric ovens.⁵⁰

In 2008, 4.3% of Victorian stovetops were fuelled primarily by LPG/bottled gas, as were 2.8% of ovens.⁵¹ Later surveys ceased to list these proportions separately.

Figure 6: Proportion of kitchen appliances fuelled by mains gas, 2011



Source: ABS (2011a), Table 5, Table 6

DEWHA's study into *Energy Use in the Australian Residential Sector* estimated that Victorians in 2005 consumed 3.4 PJ of mains gas for cooking,⁵² or around 2 GJ per household per year.⁵³ This estimate is

⁴⁹ Ibid, pers. comm.

⁵⁰ DEWHA (2008), Table 143, Table 144

⁵¹ ABS (2008), Table 3.5, Table 3.6

⁵² DEWHA (2008), Table 172; figures post-2005 are forecasts

⁵³ Based on 1,987,900 households in 2005 from ABS (2007), Table 16, and assuming 80% mains penetration

supported by the NSW Independent Pricing and Regulatory Tribunal (IPART), which found similar levels of cooking gas consumption in a 2010 survey of NSW households.⁵⁴

DEWHA concluded that:

“Cooking energy contributed to only 5% of total energy consumption. The trend is for increasing gas cook-tops and increasing electric ovens, so energy is fairly evenly split between mains gas and electricity, with 10% LPG. However, the trends suggest that total electricity consumption will remain fairly steady (ovens increasing and cook-tops decreasing) while the gas consumption (natural gas and LPG) is forecast to grow slightly, mainly through increased use of gas cook-tops.” (2008, p. 40)

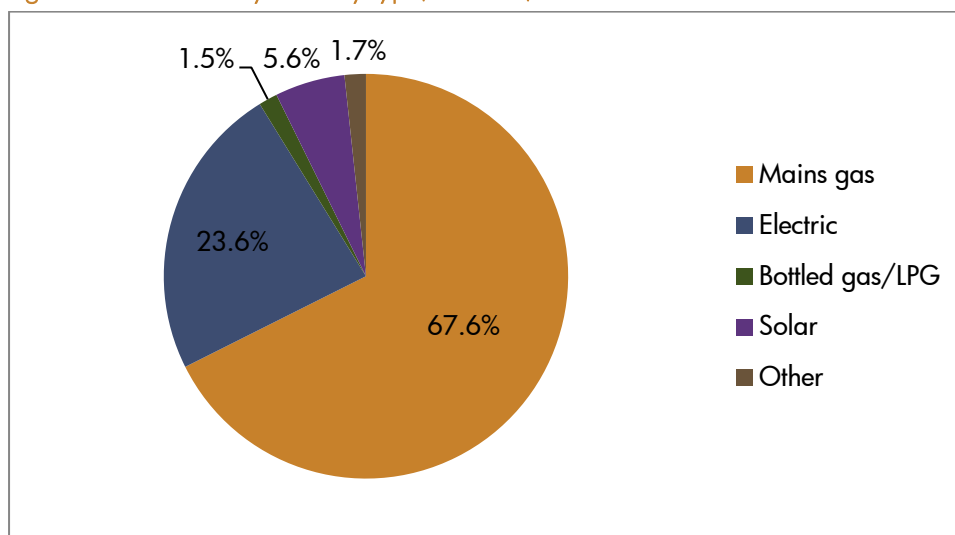
ClimateWorks Australia and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) put the figure for household cooking consumption a little lower, at 1.86 GJ/a for large households, 1.55 GJ/a for small households, and 1.24 GJ/a for apartments.⁵⁵

Cooking with gas, while common, is not a major driver of Victorian gas usage: average total annual household usage is 57 GJ in Victoria (see Table 5, above), and Nelson (2012) estimates that the lowest-consuming third of AGL’s Victorian gas customers use 22.1 GJ of mains gas per year.

Hot water

A little over two-thirds of Victorians use mains gas for hot water, while LPG/bottled gas is the least popular form of heating water (see Figure 7). The amount of energy used by hot water systems is difficult to model, due to a wide range of system constellations,⁵⁶ but Sustainability Victoria estimate that hot water heating makes up around 20% of household energy use,⁵⁷ and 16% of energy bills.⁵⁸

Figure 7: Hot water systems by type, Victoria, 2012



Source: ABS (2013a), Table 19

⁵⁴ http://www.ipart.nsw.gov.au/Home/For_Consumers/Compare_Energy_Offers/Typical_household_energy_use, retrieved 19.08.2013

⁵⁵ ClimateWorks Australia and CSIRO (2012), p. 35

⁵⁶ DEWHA (2008), p. 40

⁵⁷ Sustainability Victoria (2013)

⁵⁸ <http://www.sustainability.vic.gov.au/services-and-advice/households/energy-efficiency/at-home/hot-water-systems/>, retrieved 20.08.2014

Gas water heating systems are distributed roughly in line with mains gas connections, with around 80% of Victorian households that have mains gas connections also having gas water heaters.⁵⁹ This ratio holds across labour force regions (see Section 3, above), with notable outliers in North Eastern and South Eastern Melbourne (87% of households with mains gas have gas water heaters) and Inner Melbourne (only 61%).⁶⁰

Findings

Most household gas use in Victoria is due to heating, and Victorians heat more than any other state. Tasmanians heat for more months of the year, but Victorians heat more of their homes: two in five Victorian homes have ducted gas heating, which is ten times as common as in any other state or territory other than the ACT. Victorians rely on gas more than households in other states.

Australians are more likely to buy gas heaters because they think they're cheaper or more efficient than electric heaters or reverse cycle air conditioners, even though this is unlikely to be the case for newer models.

80% of houses with mains gas use have gas hot water; LPG hot water is uncommon. Hot water makes up around 20% of household energy usage and 16% of bills. Gas used in cooking is only a small part of consumption; 3-4% of average annual Victorian household usage.

⁵⁹ Either mains gas or LPG/bottled gas

⁶⁰ CUAC calculation, based on ABS (2012), Table 2a, Table 3a

6. How much do households spend on gas?

In 2009-10, the average Victorian gas-using household spent around \$900 on mains gas per year.^{61,62} This average rose to around \$1,070 per household in 2012 (see Table 8) and the Victorian Gas Market Taskforce recently reported that, “[in] 2013, average annual Victorian household gas costs are estimated to be \$1,200.” (Victorian Gas Market Taskforce, 2013, p. 18)

Expenditure figures for LPG/bottled gas are not robust enough to report consistently, but Victorian households outside Melbourne who use LPG/bottled gas spend around \$700 per year.

Table 8: Estimated average yearly household expenditure on energy, Victoria, 2012 (in 2014 dollars) for households using that energy source

	Melbourne	Balance of Victoria	Victoria
Electricity	\$1,457	\$1,455	\$1,474
Mains gas	\$1,074	\$1,060	\$1,071
LPG/bottled gas	see notes	\$700	see notes
Other sources of energy	see notes	\$295	see notes
Total household energy	\$2,500	\$2,308	\$2,457

The estimates of Melbourne households’ expenditure on LPG/bottled gas and other sources of energy are not reliable enough to publish, as there are few households in this category; see Table 1. This affects estimates of Victorian averages. *Source:* CUAC calculation based on weekly figures from ABS (2013a), Table 18, and ABS (2014b), Table 18B, Table 18C, inflated by 5% based on the All Groups CPI for Australia (ABS, 2014c). Note: the ABS reports averages for Victoria (all households), which we have converted to averages for gas-using-households only.

The recent increase in household spending on gas has been driven primarily by increased prices, rather than increased usage. Retail gas prices have risen 66% since 2008,⁶³ and are expected to rise another 24% to 2015.⁶⁴ The bulk of the increase in household bills has and will continue to occur in winter, as heater usage spikes. The effect of higher bills – potentially several hundred dollars higher – is more pronounced in this scenario than if the increase were spread over the entire year.

While Melbourne households use materially more mains gas than other Victorians – 56 GJ per year, versus 49 GJ per year for the balance of the state⁶⁵ – the average household expenditure is almost equal. This is likely due to the higher retail prices non-Melbourne gas users pay to reflect higher delivery charges.

The average reported usage of LPG/bottled gas was around 900 L (23 GJ) yearly in Melbourne and 650 L (16 GJ) in the rest of Victoria.⁶⁶

While ABS reports on households’ average expenditure on energy by sources of energy used in the dwelling (see Table 9), it is difficult to infer causality: do households with multiple fuel sources have higher energy expenditures as a result of having more fuels (e.g. paying daily charges for several services), or do households with greater energy needs or desires choose residences with more energy

⁶¹ Unless otherwise stated, expenditure in this section has been converted to March 2014 dollars using the All Groups CPI for Australia from ABS (2014c). The All Groups CPI was chosen to represent the change in the general purchasing power of the Australian dollar, rather than the change in the cost of individual goods or services.

⁶² Average weekly expenditure for all households is from ABS (2011c), Table 27A, which we convert to average expenditure per gas using household using figures from ABS (2011b), Table 6.

⁶³ ABS (2014c), Series A2331886K, June 2008 to June 2014,

⁶⁴ Based on a 30% rise 2013-2015 anticipated in Victorian Gas Market Taskforce (2013), p. 18, and 6% experienced March 2013 to June 2014 (ABS, 2014c, Series A2331886K).

⁶⁵ ABS (2014b), Table 18B, Table 18C

⁶⁶ ABS (2014b), Table 18B, Table 18C

sources (e.g. gas heating and wood-burning fireplace)? Are there, further, relationships between the number of energy sources a household has and its size or location? We are unable to answer these questions with the data available to us, but they deserve further study.

Table 9: Average yearly household expenditure on energy in dwellings by energy source(s) used in dwelling, Victoria, 2012 (in 2014 dollars)

	Melbourne	Balance of Victoria	Victoria
Electricity only	\$1,465	\$1,666	\$1,529
Electricity and mains gas only	\$2,410	\$2,314	\$2,402
Electricity, mains gas and other sources of household energy	\$3,382	\$2,489	\$3,221
Electricity and LPG/bottled gas only	\$5,680 [^]	\$2,499	\$2,948
Electricity, LPG/bottled gas and other sources of household energy	\$4,709 [^]	\$2,688	\$3,003
Electricity and other sources of energy only	\$2,011	\$2,251	\$2,184
Total household energy	\$2,500	\$2,308	\$2,445

[^] Estimate has a relative standard error of 25-50% and should be used with caution.

Source: CUAC calculation based on weekly figures from ABS (2013a), Table 18, and ABS (2014b), Table 18B, Table 18C, inflated by 5% based on the All Groups CPI for Australia (ABS, 2014c).

Proportional expenditure

Victorians spend 2.3% of their gross income on residential energy, roughly in line with the national average of 2.0%. (Expenditure ranges from 1.6% in the Northern Territory to 3.0% in Tasmania.)⁶⁷

Expenditure is proportionally lower in Melbourne (2.1%) than the rest of Victoria (3.1%),⁶⁸ though this is due to higher incomes of households in Melbourne rather than lower absolute energy expenditure. The lowest earning 20% of Victorian households spend almost three times as much of their disposable income on domestic fuel and power as the average household: 6.3% versus 2.2%.⁶⁹

Households on government pensions and allowances spend proportionally more on gas and energy than typical Victorian households: households receiving age pensions, disability or carer payments, unemployment or study payments, family support payments, or other payments spend 5.0-5.4% of their gross incomes on domestic fuel and power (net of concessions), twice as high as the Victorian average of 2.2%.⁷⁰

Concessions

The Victorian Government provides some assistance to gas consumers with concession status. The Winter Gas Concession reduces mains gas bills by 17.5% from May to October, after discounts and other concessions have been applied.⁷¹ Users with particularly high gas bills – the top 5%, roughly – need to apply for the Excess Gas Concession to continue to receive the 17.5% rebate.⁷²

⁶⁷ ABS (2013a), Table 18

⁶⁸ ABS (2014b), Table 18B, Table 18C

⁶⁹ ABS (2011d), Table 5, Table 6

⁷⁰ Ibid, Table 11, Table 12

⁷¹ <http://www.dhs.vic.gov.au/forindividuals/financial-support/concessions/energy/winter-gas-concession>, retrieved 10.07.2014

⁷² Ibid

Concession card holders not on the mains gas network can apply for the Non-Mains Energy Concession, which offers flat rebates for different utility expenditure bands (e.g. \$45 if spending is between \$100 and \$254.99; \$134 if spending is between \$255 and \$766.99; etc.).⁷³ The flat rebates provide a minimum of 17.5% concession across the entire year.

Households eligible for each of these concessions are those with a Pensioner Concession Card, Health Care Card, or Department of Veterans Affairs Gold Card.

These households, or low-income households on their utility company's hardship program, can also apply for a Utility Relief Grant (URG). Under certain circumstances, the URG scheme will provide households with a grant of up to \$500 to pay utility bills if they are in temporary financial crisis.⁷⁴

Effects on households

Consumers generally will need to adapt to rising retail gas prices. Those with higher incomes and who own their homes should have the ability to deal with the price rises, as the proportion of their incomes being spent on energy is low and they can adjust their usage via behavioural or appliance change (i.e. improve their energy efficiency). However, other household groups will feel the effects more keenly.

Households on low incomes and/or on government pensions and allowances spend several multiples more on gas and energy generally than average households, and are thus more susceptible to problems from higher gas bills. The capacity to cut back on other expenditure to pay energy bills is lower, and the essential nature of energy services means reductions in usage is also limited.

The 'lumpiness' of gas bills, in that they're concentrated during months of winter heating, can also be problematic for households that lack the financial means to absorb these bills or 'smooth' them over the year. Payment plans from retailers and government concessions are important in this respect, and recent reports on consumers in hardship or payment difficulty offer a range of recommendations.⁷⁵

Findings

A typical Victorian household spends around \$2,500 per year on energy, of which 30-45% is gas expenditure. Households with gas – either mains gas, LPG/bottled gas, or both – have higher bills than electricity-only households, but that may be due to factors such as dwelling size, e.g. houses are more likely to have gas than apartments.

Households outside Melbourne spend a greater proportion of their income on energy than Melburnians do, and households on low incomes spend almost three times as much on energy relative to their incomes as average households. Further, households on government pensions and allowances spend twice as much as the Victorian average on domestic fuel and power.

These households, along with renters, are more vulnerable to rising gas bills than other households. They may have lesser ability to absorb the higher costs, lesser ability to reduce usage (e.g. because it is

⁷³ <http://www.dhs.vic.gov.au/for-individuals/financial-support/concessions/energy/non-mains-energy>, retrieved 10.07.2014

⁷⁴ <http://www.dhs.vic.gov.au/for-individuals/financial-support/concessions/hardship/utility-relief-and-non-mains-utility-grant-scheme>

⁷⁵ See e.g. FCA & ACCAN (2014) and CALC (2014)

already low), or lesser ability to upgrade the energy efficiency of their homes because they can't afford the upfront costs or because they lack the right to make major changes.

Consumers generally will need to adapt to rising retail gas prices, but those with higher incomes and who own their homes should be able to respond by changing their usage or improving the energy efficiency of their homes and appliances.

Retail gas prices are expected to rise 25% by 2015, on top of a 49% rise in the last five years. Bill increases will be felt especially in winter as heater usage is concentrated in colder months. This 'peakiness' will make the effects of bills more pronounced than if the increases were spread across the year.

The Victorian Government provides assistance to households with a Pensioner Concession Card, Health Care Card, or Department of Veterans Affairs Gold Card.

7. Gas expansion in regional Victoria

As described in previous sections, mains gas penetration rates are much lower outside Melbourne. In 2011, the Victorian Government set up the Energy for the Regions program, administered by Regional Development Victoria,⁷⁶ which allocated \$100 million over 2011-2018 for the connection of regional and rural communities to the Victorian mains gas network.⁷⁷ The funding covers subsidies for gas distribution businesses to extend their pipelines to fourteen regional and rural towns, connect homes to the networks, and replace electric or upgrade LPG appliances with mains gas equivalents.

The Government funds the gas network expansion to drive investment in regional communities and provide a more dependable and cheaper energy source (than bottled gas).⁷⁸ Gas distribution businesses would not, in the ordinary course of their operations, have extended their networks to these towns and businesses: the extensions would have been unprofitable and it is highly unlikely the Australian Energy Regulator would have approved their plans to do so.⁷⁹

The extent to which the Energy for the Regions has subsidised distribution businesses varies from project to project, and is often confidential. The best information we have is on projects to connect Huntly (10 km north of Bendigo), Avoca (70 km north-west of Ballarat), and Warburton (70 km east of Melbourne).

Extending gas to 580 properties in Huntly costs around \$7,800 per property, of which the Government is paying 57%. Connecting 700 properties in Avoca will cost the Government around \$12,000 per connection; the total project cost is unknown.⁸⁰ Extending the gas distribution network to Warburton will cost around \$11,800 per connection, of which the Government is paying 80%.⁸¹

While the Energy for the Regions program may have provided a short term benefit to those households connected, it is uncertain whether this investment is appropriate over the long term or whether rising gas prices mean the program's goals could be more efficiently achieved through alternative measures. This is an issue the Government should review.

Findings

To lower households' gas bills, the Government is subsidising the rollout of mains gas into areas where it would not otherwise be profitable. The Government is carrying up to 80% of projects' costs, and paying up to \$12,000 per property to connect people to mains gas.

It is uncertain whether the Energy for the Regions program is the most appropriate method to deliver the intended benefits to regional households in light of rising gas prices.

⁷⁶ State Government of Victoria (2011)

⁷⁷ <http://www.rdv.vic.gov.au/infrastructure-programs/energy-for-the-regions>, retrieved 28.04.2014.

⁷⁸ Ryan MP (2012), Ryan MP (2013)

⁷⁹ C.f. "The [direct negotiation process] did not elicit a strong response from the gas distribution businesses. The majority of proposals received by [Regional Development Victoria] contained subsidy requests assessed by RDV's technical advisors as being too high or were subject to conditions that could not reasonably be accepted by the State. RDV understands from its discussions with gas distribution businesses that capital constraints, primarily as a result of the current economic environment, and an insufficient return on investment are seen by distribution businesses as key obstacles to participation in the Program." (Regional Development Victoria, 2012, p. 2)

⁸⁰ <http://www.rdv.vic.gov.au/infrastructure-programs/energy-for-the-regions>, retrieved 28.04.2014, and Regional Development Victoria, personal communication, 22.05.2014

⁸¹ United Energy/Multinet Gas, Briefing on Gas Reticulation to Customer Consultative Committee, 06.05.2014

8. Policy implications and recommendations

In the last six years, electricity prices in Victoria have doubled.⁸² This has, deservedly, received a lot of media and consumer attention. But electricity is not the only essential service to deserve attention: over the same period gas prices have risen 66%,⁸³ and they are expected to rise a further 24% by 2015.⁸⁴ This would add around \$300 to the average Victorian's annual gas bill, or over \$500 for high gas users.

A number of recent reports into the east coast gas market⁸⁵ have identified potential systemic issues that affect the entire eastern seaboard, notably issues of gas market reform, supply competition, data and transparency, infrastructure, non-market interventions, and governance.⁸⁶ We do not address these issues in this report, but instead focus on policy implications for the Victorian residential sector.

Consumers are not sufficiently aware of the rising price trajectory of gas or its implications for them. The Victorian Government needs to address this issue as a priority.

Nine out of ten Victorian households use natural gas, mostly from the reticulated mains network, and gas usage is high across income levels and regions. Price rises will affect close to two million households. Natural gas is, by large majority, Victorians' primary fuel for heating, cooking, and hot water. Gas is more important for Victorian households than for households in any other state, but many are unprepared for price increases. Low income households, in particular, are vulnerable to sudden and unexpected bill spikes.

The role of gas as a continuing cheap alternative to electricity is in doubt. Victorians are more likely than residents of other states to have positive attitudes toward gas, due in part to current and past Government schemes promoting gas use as cheaper, more environmentally friendly,⁸⁷ and relieving pressure on family budgets.⁸⁸ This made sense when gas was abundant and cheap, but these attitudes must be revisited, along with the Government's role in the public's use of gas.

Victorians need to become conscious of their gas usage, as we became water conscious during the millennium drought and electricity conscious in recent years.

Victorian Governments have, for decades, encouraged the public to use gas. The Government therefore bears some responsibility for now updating consumers' attitudes to reflect the pivotal shift in the gas market. Otherwise, consumers may feel aggrieved if they are caught unawares by rising gas bills. In particular, households that have received Government support to connect to gas networks or replace electric appliances with gas alternatives⁸⁹ may consider the Government responsible for increased costs in coming years.

⁸² ABS (2014c), Series A2328106A, June 2008 to June 2014

⁸³ Ibid, Series A2331886K, June 2008 to June 2014,

⁸⁴ Based on a 30% rise 2013-2015 anticipated in Victorian Gas Market Taskforce (2013), p. 18, and 6% experienced March 2013 to June 2014 (ABS, 2014c, Series A2331886K).

⁸⁵ See, e.g. ACIL Allen Consulting (2013), AEMO (2013), AIG (2013), Deloitte (2013), Dol and BREE (2014), Victorian Gas Market Taskforce (2013), and Wood, Carter, & Mullerworth (2013).

⁸⁶ Dol and BREE (2014), p. 90

⁸⁷ Ryan MP, Delivering energy for the regions (2012)

⁸⁸ Ryan MP, \$85 million natural gas tender to unlock regional potential (2013)

⁸⁹ E.g. the "Warmer Winter" discount, <http://www.sustainability.vic.gov.au/services-and-advice/households/rebates/gas-heater-discount-for-concession-card-holders>

The complexity of modern energy contracts means many consumers struggle to find the most appropriate offers from them. The Victorian Government’s “My Power Planner” price comparison website provides a valuable service to residential consumers of electricity, and we support the planned expansion of the website to include retail gas offers. It is important that consumers be able to actively respond to price rises and seek their own solutions.

Recommendation 1

The Victorian Government should develop a comprehensive information and education strategy to build consumers’ awareness of gas price changes and their options to respond.

Recommendation 2

The Victorian Government should increase consumer awareness of My Power Planner.

Forthcoming research by the Alternative Technology Association (ATA) finds that, for most Victorians, high efficiency electric heating and hot water appliances are cheaper than their gas equivalents over the life of the appliance (considering both purchase cost and running costs). Where mains electricity is available, this is true for mains gas, LPG, and bottled gas.⁹⁰

If Victorians have a gas appliance that fails or is near the end of its lifespan, the ATA suggests most people will save money by switching to a high efficiency electric alternative. Further, most Victorians who have only one gas appliance (for either heating, cooking, or hot water) on mains gas will save money by switching to an electric alternative regardless of whether the appliance is due for replacement, due to avoided fixed charges.⁹¹

However, where a household has gas appliances that are fully functional and are not expected to fail soon, we do not recommend replacement. For many consumers, gas may continue to be the cheaper option in the short to medium term until their appliances fail. It would be an undesirable and perverse outcome if consumers react to rising gas bills by switching from gas to low efficiency electric appliances. This is a particular concern for low income or vulnerable groups, for whom the lower upfront costs of inefficient appliances may represent a (false) economy.

Information that lets consumers compare appliance and investment decisions across technology types should become integrated into rating and labelling standards. This may involve further investigation by Governments to determine relative expected running costs, but this is an appropriate role for Governments to play; calculation of lifetime costs is impractical for consumers to do themselves and unlikely to be provided by the market, the ATA’s work notwithstanding.

Consumers are more likely to buy gas heaters because they think they’re cheaper or more efficient than electric heat pumps or reverse cycle air conditioners, and this misperception should be corrected: consumers require accurate comparative information.

Insight into the running cost of appliances and technology types and appliances should also inform State and Federal Government policies on social and community housing. It should not be the case that

⁹⁰ ATA (forthcoming) The Impact of Future Gas Price Increases and Cost Effective Alternatives for Energy Consumers

⁹¹ Ibid

households receiving Government assistance are locked into higher bills due to decisions beyond their control: social and community housing should allow residents to maintain an adequate standard of living at an affordable cost. This would also save Governments money on their concession budgets.

Recommendation 3

The Federal Government should update appliance energy ratings and labels to allow comparisons of estimated appliance life cycle costs across fuel types (e.g. gas versus electricity, rather than just gas versus gas).

Recommendation 4

Complementing Recommendation 3, the Federal and/or Victorian Governments should conduct further research into the relative costs of gas versus electric (or other) appliances for different household types and regions, expanding on the Alternative Technology Association's work.

Recommendation 5

The insights from the ATA's work and Recommendation 4 should inform the Federal and Victorian Governments' choices of appliances in social housing.

The need to address lack of choice extends beyond social and community housing: renters and households on low incomes will also have limited ability to alter their demand for gas. They often face split incentives and structural barriers, including inability to change appliances, lack of capital necessary to do so, or usage so low it cannot be reduced further without causing hardship. With low income households spending almost three times as much of their disposable income on energy as the average household, they are particularly vulnerable to rising prices.

Recommendation 6

The Federal and Victorian Governments should develop energy efficiency programs to target households with high energy use, particularly low income and vulnerable households.

As bills rise, the rate of gas disconnections is likely to increase. Households that excessively limit their usage of gas, especially vulnerable households, may face adverse health effects from insufficient heating in winter. Cold housing has been associated in New Zealand with more frequent visits to general practitioners, hospitalisation for respiratory problems, absence from school (in children) and work (in adults), and higher rates of avoidable deaths in older people.⁹²

Many of the problems relating to housing stock could be addressed by standards on new buildings and implementing the 2010 Victorian election commitment by both the current Government and Opposition to upgrade Victoria's housing stock to an average five star rating, with a particular focus on retrofitting the homes of low income Victorians.⁹³ Sustainability Victoria finds that, "[an] energy efficient household can save about 40% of an average household's energy costs." (2014, p. iii) As disproportionate

⁹² Chapman, Howden-Chapman, and O'Dea (2004)

⁹³ C.f. the One Million Homes plan <http://environmentvictoria.org.au/onemillionhomes>

numbers of low income households live in below average quality housing stock, many could save even more than this.

Recommendation 7

The Victorian Government should improve the energy efficiency rating of Victoria's housing stock to an average of five stars to lower Victorians' need for energy, e.g. through improved building standards, retrofits, and/or incentives for landlords to increase the energy efficiency of private rental accommodation.

It would be prudent for Governments to revisit subsidies for gas usage and explore whether the objectives of those subsidies could be achieved in different, more appropriate ways. Similarly, money that might be spent on greater energy concessions as gas bills rise might achieve a greater effect if spent pre-emptively on measures helping consumers adapt to change, rather than absorb it. (This is not to suggest that households in need should receive lesser concessions.)

The subsidies the Government spends connecting households to mains gas may be more effectively spent on building retrofits or energy efficiency programs. Programs to replace inefficient appliances with high efficiency variants, as the "Warmer Winter" heater replacement program did in Victoria from 2012 to 2014, are sensible, but unlike the Warmer Winter program the solution should be technology neutral: the most efficient and appropriate appliance across all technologies should be considered, not just gas appliances.

Recommendation 8

The Federal and Victorian Governments should offer households assistance to upgrade the energy efficiency of their own homes and appliances, including assistance that addresses information, behavioural, and – where appropriate – capital barriers. (See e.g. the Federal Government's No Interest Loans Scheme or the Victorian Energy Efficiency Target.)

Recommendation 9

Federal and State Government policies to improve households' energy services or help with their costs should become fuel and technology neutral. For example, inefficient appliances should be upgraded to the most cost effective appliance of any technology, rather than only the most efficient gas appliance.

Recommendation 10

Similarly, the Energy for the Regions program could be evaluated to determine whether the goals of the program require gas distribution networks to be expanded, or whether they could be met more effectively – and at lower long term cost to consumers – through other methods that may not involve gas, such as appliance or building efficiency upgrades.

The current structure of Victorian energy concessions means households in certain network areas and gas zones will be affected differently to households in other areas, and the Government's ability to promptly adjust concession caps is limited,⁹⁴ further complicating the situation.

Recommendation 11

Energy retailers should review their hardship programs and payment plans, and the Federal and Victorian Governments should review their concessions, to assess whether they are suited to dealing with consumers experiencing higher and 'lumpier' gas bills.

Recommendation 12

Decision makers and stakeholders should consider whether rising gas prices will cause households to leave the gas network, and what effect this might have on network businesses and remaining consumers.

Victoria's gas using households stand to bear greater costs than any others from the effects of east coast gas exports on retail prices. Consumers and governments must revisit their attitudes toward gas to ensure that adjustments to these developments, and policy responses, are not more costly than they need be.

⁹⁴ Johnston (2013), pp. 25-26

9. Bibliography

- ABS. (2007). *6523.0 Household Income and Income Distribution, Australia, 2005-06*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2008). *4602.0.55.001 Energy Use and Conservation, March 2008*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2011a). *4602.0.55.001 Environmental Issues: Energy Use and Conservation, March 2011 – Additional Tables*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2011b). *4602.0.55.001 Environmental Issues: Energy Use and Conservation, March 2011*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2011c). *6530.0 Household Expenditure Survey, 2009-10: Detailed Expenditure Items*. Canberra: Australia Bureau of Statistics, Commonwealth of Australia.
- ABS. (2011d). *6530.0 Household Expenditure Survey, 2009-10: Victorian tables*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2012). *4602.2 Household Water and Energy Use Victoria*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2013a). *4670.0 Household Energy Consumption Survey, 2012 – Summary Tables*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2013b). *6523.0 Household Income and Income Distribution, Australia, 2011-12*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2014a). *3101.0 Australian Demographic Statistics*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2014b). *4670.0 Household Energy Consumption Survey, 2012 – Additional Tables*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- ABS. (2014c). *6401.0 Consumer Price Index*. Canberra: Australian Bureau of Statistics, Commonwealth of Australia.
- Access Economics. (2001). *Impact on Victoria of the privatisation of the State's electricity and gas assets*. Canberra: TXU Australia.
- ACIL Allen Consulting. (2013). *Australia's Natural Gas Supply: an assessment of current policy issues and options*. Australian Pipeline Industry Association.
- AEMO. (2013). *Gas Statement of Opportunities 2013*. Australian Energy Market Operator.
- AIG. (2013). *Energy shock: the gas crunch is here*. Australian Industry Group.
- BREE. (2013). *Australian energy statistics 2013*. Canberra: Bureau of Resources and Energy Economics, Commonwealth of Australia.
- CALC. (2014). *Problems with Payment: How energy retailers can assist consumers having trouble paying bills*. Melbourne: Consumer Action Law Centre.

- Chapman, R., Howden-Chapman, P., & O'Dea, D. (2004). *A cost-benefit evaluation of housing insulation: results from the New Zealand 'Housing, Insulation and Health' study*.
- ClimateWorks Australia and CSIRO. (2012). *Low Carbon Lifestyles: A Practical Guide for Households*. Melbourne: Origin Energy.
- CUAC. (2012). *Market Power in the Victorian Retail Energy Market*. Melbourne: Consumer Utilities Advocacy Centre Ltd.
- CUAC. (2013). *Making the Gas Connection*. Melbourne: Consumer Utilities Advocacy Centre Ltd.
- Deloitte. (2013). *Assessment of the East Coast gas market and opportunities for long-term strategic reform*. Energy Supply Association of Australia.
- DEWHA. (2008). *Energy Use in the Australian Residential Sector, 1986-2020*. Canberra: Department of the Environment, Water, Heritage and the Arts, Commonwealth of Australia.
- Dol and BREE. (2014). *Eastern Australian Domestic Gas Market Study*. Canberra: Department of Industry, and Bureau of Resources and Energy Economics, Commonwealth of Australia.
- FCA & ACCAN. (2014). *Hardship Policies in Practice: A comparative study*. Financial Counselling Australia and the Australian Communications Consumer Action Network.
- Johnston, M. M. (2013). *Winners and Losers: the impact of energy concession caps on low-income Victorians*. Consumer Action Law Centre and the Victorian Council of Social Service.
- Kimber, M. (2009). *Development of Australia's Natural Gas Resources*. Garran, ACT: Department of Resources, Energy, and Tourism, Commonwealth of Australia.
- Lowe, K. (2013). *Gas Market Scoping Study*. Australian Energy Market Commission.
- Morse, R. N. (2000). Energy. In *Technology in Australia 1788-1988* (pp. 748-825). Melbourne: Australian Academy of Technological Sciences and Engineering.
- Nelson, T. (2012). Securing Gas Supplies for Domestic Consumption in the Long Term. *APPEA Journal*, pp. 105-114.
- Regional Development Victoria. (2012, May 23). *Energy for the Regions Program*. Retrieved May 07, 2014, from Regional Development Victoria:
http://www.rdv.vic.gov.au/__data/assets/pdf_file/0003/196851/Energy-for-the-Regions-Next-Stages5-13.pdf
- Ryan MP, T. H. (2013, September 2). \$85 million natural gas tender to unlock regional potential. Melbourne: State Government of Victoria.
- Ryan MP, T. H. (2012, May 12). Delivering energy for the regions. Melbourne: State Government of Victoria.
- State Government of Victoria. (2011). *Regional Growth Fund booklet*. Retrieved April 28, 2014, from Regional Development Victoria:
http://www.rdv.vic.gov.au/__data/assets/pdf_file/0006/188322/RGF-6295_12pp-BOOKLET_web.pdf

Sustainability Victoria. (2013, January). Hot Water Systems Factsheet. Melbourne, Victoria, Australia: Sustainability Victoria, State Government of Victoria.

Sustainability Victoria. (2014). *Victorian Households Energy Report*. Melbourne: Sustainability Victoria, State Government of Victoria.

Victorian Gas Market Taskforce. (2013). *Final Report and Recommendations*. Melbourne: State Government of Victoria.

Wilkenfeld, G. (2008). *Victoria's Greenhouse Gas Emissions 1990, 1995, 2000 and 2005: End-Use Allocation of Emissions*. Melbourne: Department of Sustainability and Environment, State Government of Victoria.

Wood, T., Carter, L., & Mullerworth, D. (2013). *Getting gas right: Australia's energy challenge*. Melbourne: Grattan Institute.

