IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Residential energy and water use in Sydney, the Blue Mountains and Illawarra

Results from the 2010 household survey

Electricity, Gas and Water — Research Report
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The Tribunal members for this review are:

Mr Rod Sims, Chairman

Mr James Cox, Chief Executive Officer and Full Time Member

Ms Sibylle Krieger, Part Time Member

Inquiries regarding this document should be directed to a staff member:

Bee Thompson (02) 9290 8496

Michael Seery (02) 9290 8421

Independent Pricing and Regulatory Tribunal of New South Wales
PO Box Q290, QVB Post Office NSW 1230
Level 8, 1 Market Street, Sydney NSW 2000

T (02) 9290 8400 F (02) 9290 2061

www.ipart.nsw.gov.au

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1 Introduction and executive summary

In 2010 the Independent Pricing and Regulatory Tribunal of NSW (IPART) surveyed residential water, electricity and gas consumers in the Sydney metropolitan, Blue Mountains and Illawarra areas (Sydney).[1] We collected water, electricity and gas consumption data, as well as socio-economic, demographic and behavioural data at the household level. We also collected some data about the use of public transport.

We previously surveyed residential water, electricity and gas consumers in Sydney in 1993, 1996, 2003 and 2006. We also surveyed the Gosford, Wyong and Hunter areas in 2008.

1.1 Purpose of the survey

As in previous household surveys, our main aim for the 2010 survey was to collect information on the characteristics of households and their energy and water use that will help us to:

- assess the impact of our energy and water pricing decisions on different households and community groups, particularly low-income households
- assess the extent of participation in the competitive retail energy market, and households' experience in this market.

To strengthen our ability to assess the impact of our decisions on customers, we engaged NATSEM[2] to develop an impact assessment model using data from the 2010 Sydney survey, as well as the 2008 survey in the Hunter, Gosford and Wyong areas. This model will also be able to calculate the impact of any changes in government concessions policy on customers' bills, and on the total cost of the utilities concessions programs to the NSW Government. We expect this tool to be operational in 2011.

An additional aim for this survey was to strengthen our ability to assess the impacts of our public transport pricing decisions on customers. To do this, we are working with NATSEM to explore the possibility of combining data from our 2010 survey

1 These areas cover Sydney Water's area of operation.
2 National Centre for Social and Economic Modelling, University of Canberra.

with data on travel behaviour from the Bureau of Transport Statistics.[3] To assist in the process of combining the data, the 2010 survey asked respondents about their use of public transport and access to private vehicles. Our ultimate intention is to include public transport in the impact assessment model.

The survey methodology is briefly described in Chapter 2, and in more detail in Appendix A.

1.2 Overview of survey results

In analysing the survey results, our main aims were to better understand how household characteristics influence consumption, and to identify income and affordability issues. Where possible, we also aimed to identify what had changed in Sydney since 2006, which we did mainly by comparing the results from our 2010 household survey with those from our 2006 household survey[4]. To identify differences and similarities between the Sydney and the Hunter, Gosford and Wyong survey regions, we also compared the results from our 2010 household survey in Sydney with those from the 2008 household survey in the Hunter, Gosford and Wyong areas.[5]

The results suggest (sometimes strong) relationships between energy and water consumption and various household characteristics. However, it is important to recognise that such relationships do not necessarily imply causation. Consumption may be driven by other underlying factors, or a complex combination of factors. Therefore the results should be interpreted with caution. For example, on average households that live in free-standing houses use more water than households that live in flats[6]. But this does not mean that living in a free-standing house *causes* a higher level of water consumption. Households that live in free-standing houses also display other characteristics that are associated with higher water consumption, such as having more occupants and watering their gardens.

Comparisons between the 2006, 2008 and 2010 survey findings should also be interpreted with caution. Some of the observed differences may be due to differences in sampling methodology, as well as the different methods used to weight the data (see Appendix A). In particular, the volumetric differences in average consumption between the Sydney 2006 survey and the Sydney 2010 should not be interpreted as representing the actual changes in consumption for all of Sydney's residential customers. In recognition of this, throughout the report we compare patterns and trends rather than focus on differences in the actual amounts consumed.

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3 The Bureau of Transport Statistics (BTS) of Transport NSW conducts a continuous Household Travel Survey to obtain data on the travel behaviour of residents in the greater Sydney metropolitan area.

4 IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra - Results from the 2006 household survey*. Electricity, Gas and Water – Research Paper 29, 2007.

5 IPART, *Residential energy and water use in the Hunter, Gosford and Wyong - Results from the 2008 household survey*. Electricity, Gas and Water – Research Paper, December 2008.

6 Flats include low, medium and high rise blocks of flats.

It should be noted that most of our analysis for the 2010 survey focused on Sydney Water's whole area of operation (Sydney), mainly because the sample sizes for the Illawarra and Blue Mountains were too small for detailed analysis.

The sections below summarise the survey results on:

- the major changes in Sydney households' consumption levels and attitudes to environmental issues
- the relationship between consumption levels and household characteristics
- the relationship between income, consumption levels, and payment difficulties
- public transport use and access to private vehicles
- households' experience of competition in the energy market.

1.2.1 Major changes in consumption and attitudes to the environment

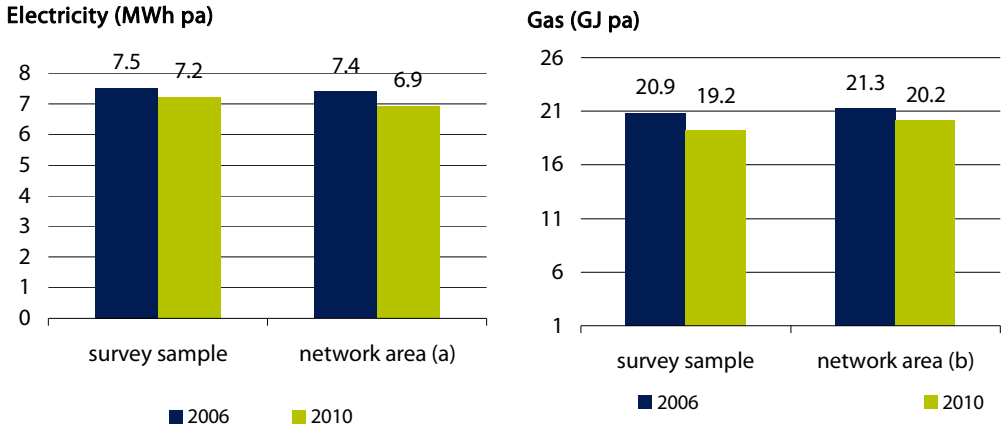
The 2010 Sydney survey asked many of the same questions as the 2006 Sydney survey. Comparing the responses and using other sources of information, we were able identify some broad trends in consumption and attitudes to the environment.

Household electricity and gas consumption has fallen

Our surveys found that the average amount of domestic energy (electricity and gas) that households use fell between 2006 and 2010. Information from the energy utilities confirms this declining trend: average electricity consumption in the combined network areas of EnergyAustralia and Integral Energy fell by 6% between 2005/06 and 2009/10, and average gas consumption in NSW fell by 5% over the same period (Figure 1.1).[7]

[7] These are the percentage reductions for all residential customers on the respective networks, rather than customers in our survey area alone. Jemena is the gas network provider for the whole of NSW.

Figure 1.1 Average electricity and gas consumption in Sydney (MWh pa)



a Average residential consumption for 2005/06 and 2009/10 for the combined network area of EnergyAustralia and Integral Energy.

b Average residential consumption for 2005/06 and 2009/10 for Jemena's NSW network area (whole of NSW).

Data source: Calculated by IPART using information provided by EnergyAustralia and Integral Energy, and IPART household surveys.

We identified a number of factors that could have contributed to this declining trend, including:

- higher utility prices, particularly for electricity
- the introduction of additional energy (and water) saving schemes by the NSW Government and the Commonwealth Government, and
- greater awareness of environmental issues.

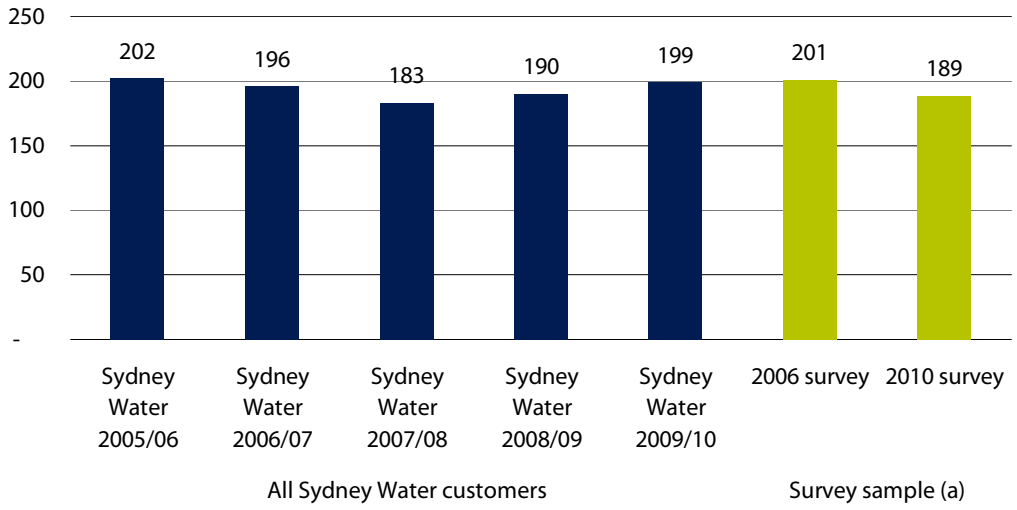
Our survey findings suggest some of the reduction in electricity consumption may be due to a switch from using electricity for hot water to using gas and solar hot water systems.[8]

Household water consumption has responded to water restrictions and other factors

The combination of water restrictions, water saving schemes and rising prices has contributed to a fairly substantial decrease in the average consumption of water by Sydney Water's residential customers since 2003. Information from Sydney Water indicates that consumption was lowest in 2007/08, which was the 3rd year of level 3 water restrictions. However, it rose again in response to the easing of these restrictions from June 2008 (Figure 1.2).

8 This could also help to explain why consumption on controlled load tariffs, which are mainly used for hot water, fell by more than consumption on other tariff types for residential customers in both the EnergyAustralia and Integral Energy network areas between 2005/06 and 2009/10.

Figure 1.2 Average household water consumption for all Sydney Water customers and for the Sydney (2010) and Sydney (2006) surveys (kL pa)



Note: Average consumption for the 2010 survey sample was measured for a 12 month period starting in January, February or March 2009, while water restrictions were still in place.

Data source: Calculated by IPART using information provided by Sydney Water, and IPART household surveys.

However, households in single dwellings[9] consumed about 4% less water in 2009/10 (when Water Wise Rules had replaced water restrictions) than they had in 2005/06 (the 1st year of level 3 restrictions).[10] Evidence from our surveys suggests that this might indicate permanent changes in behaviour, for example due to more widespread use of dual flush toilets, greater use of grey water and greater use of water from rain water tanks.

Environmental issues have become more important to households

Responses to some of our survey questions suggest that environment issues have become more important to Sydney households. For example:

- We asked households to rate the importance of 8 attributes of a water supply service. Between 2006 and 2010, 'good environmental management' and 'incentives to save water' became more important relative to the other attributes.
- Compared to 2006, a higher proportion of households in 2010 indicated that their main reason for entering into a market contract with an electricity retailer was that 'it offered green energy' (9%, up from 5%).

9 Sydney Water defines 'single dwellings' to include free-standing houses as well as semi-detached houses and terraces which are not strata or company titled.

10 This reduction is for all Sydney Water's residential customers who live in single dwellings, and does not refer to our survey findings.

1.2.2 The relationship between electricity, gas and water consumption and household characteristics

The 2010 results confirm many of the findings from previous surveys

The 2010 survey results for Sydney confirm many of the relationships between electricity, gas and water use and household characteristics observed in the 2006 results for Sydney and the 2008 results for Hunter, Gosford and Wyong. In particular:

- Households that have higher electricity, gas and water consumption are likely to:
  - have more occupants
  - live in free-standing houses rather than other dwelling types (such as semi-detached dwellings[11] and flats)
  - have more electricity and/or water-using appliances/amenities (such as air conditioners, second refrigerators, dishwashers and swimming pools), and use them more often.
- Households that do not use gas as a source of domestic energy are likely to use more electricity.[12]
- Households that live on large blocks of land are likely to use more water, particularly if they water their gardens with sprinklers.
- On average, higher income households use more electricity, gas and water than lower income households.

There are important differences between the survey areas

The survey results also identify important differences in the consumption patterns of households in the different areas within Sydney and in the Hunter, Gosford and Wyong areas. In particular, on average, households in the Sydney metropolitan area consume more electricity, gas and water than households in the Illawarra or Hunter, Gosford and Wyong areas. Some of the reasons for this appear to be that:

- Households in the Sydney metropolitan area are larger, and are more likely to comprise couples with children than households in the Illawarra or the Hunter, Gosford and Wyong areas. For example, the 2006 Census data indicate that 46% of households in the Sydney metropolitan had 3 or more occupants, compared to about 40% in the Illawarra and the Hunter, Gosford and Wyong areas.

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11 For the purposes of reporting our survey findings, we have defined 'semi-detached dwellings' to include semi-detached and terrace houses, villa units, town houses, duplexes and granny flats (there were very few granny flats in the survey samples).

12 This relationship was found to be stronger in Sydney than in the Hunter, Gosford and Wyong areas. The reasons for the weaker relationship in the Hunter, Gosford and Wyong areas are unclear, but may and may be due to the more limited availability of mains gas in the region and the smaller sample size.

- Average household incomes are higher in the Sydney metropolitan area than in the Illawarra and the Hunter, Gosford and Wyong areas. For example, the 2006 Census data indicate the median household income in the Sydney metropolitan area was $1,154 per week, while the median household income in the Illawarra was $872 and in the Hunter, Gosford and Wyong area it was $877 per week.
- The Illawarra and the Hunter, Gosford and Wyong areas are all predominantly coastal areas, and households in these more temperate coastal areas may have less need for space heating and cooling than inland areas (such as the Sydney metropolitan area's western suburbs). Higher rainfall in the coastal areas may also play a role in the amount of water used outdoors.

Households in the Blue Mountains also use less water than households in the Sydney metropolitan area, partly because they have fewer occupants. But these households on average use significantly more electricity and gas than in any of the other regions, possibly because their winters are colder. Another possible reason is that, compared to the Sydney metropolitan area, a far higher proportion of households in the Blue Mountains live in free-standing houses (and there is a fairly strong association between living in a free-standing house and using more energy).[13]

Higher energy consumption is associated with having more large appliances and frequently using those appliances

The survey asked households whether they have a range of large energy using appliances and amenities, and if so, how often they use them. These included clothes dryers, dishwashers, washing machines, microwave ovens, second refrigerators, air conditioners and swimming pools (the pumps of which use energy). The results clearly indicate that higher energy (and often water) consumption is associated with having such appliances, and with more frequent use of these appliances.

The survey asked more detailed questions about air conditioners because they are widely believed to contribute significantly to daily peak loads on the electricity network. Respondents were asked whether they have an air conditioner installed. If they did, they were asked how often, and for how long they use their air-conditioners during different seasons and times of the week. The results show clearly that the more frequently air conditioners are used, the more electricity is consumed.

The factors that most influence whether or not a household has an air conditioner, and how often they use it, are dwelling type and region (the latter due to climate). Unlike for items such as swimming pools, income levels do not seem to have much influence on whether or not a household has an air conditioner.

[13] In 2010, 98% of surveyed households in the Blue Mountains lived in free-standing houses, compared to 58% of surveyed households in the Sydney metropolitan area.

Where households have similar characteristics, gas usages reduces electricity consumption

The relationship between gas usage and electricity consumption is not straightforward. Firstly, households with mains gas tend to use more domestic energy than households without gas, because they are on average larger and fall into higher income brackets. They are also more likely to live in free-standing houses. Secondly, the amount of gas that a household uses (instead of electricity) depends on what it uses gas for. Households that use gas only for cooking use the least gas (and therefore more electricity). But our survey data show clearly that, if we compare households with similar characteristics (such as household size), those with mains gas use less electricity than those without gas. These findings were similar for the 2006, 2008 and 2010 surveys.

Households in Sydney are more likely to use mains gas (and less likely to use cylinder gas) compared to the Hunter, Gosford and Wyong areas, because of the wider penetration of mains gas in Sydney.

The impact of ceiling insulation on energy consumption is not clear

The 2010 survey found that 18% of Sydney households had installed ceiling insulation in the 12 months prior to the survey. Low income owner-occupiers of free-standing houses were particularly likely to have installed ceiling insulation in this period (32% of these households). However, the survey did not shed light on the relationship between ceiling insulation and energy consumption.

High water consumption is associated with watering gardens, particularly with sprinklers

Watering gardens can use large volumes of water. Our survey findings for Sydney (2010) and the Hunter area (2008) clearly show that households that water their gardens use more water than households that don't. Households use particularly large amounts of water if they use sprinklers to water their gardens and if they live on large blocks of land.[14]

Some households use alternative sources of water to mains water, mainly for outdoor use

The likelihood of households using alternative sources of water to mains water seems to be associated with whether or not the area in which they live faces water shortages and therefore has water restrictions and other measures in place to reduce the use of mains water. We found that households that live in free-standing houses in Sydney were less likely to use grey water and/or water from rainwater tanks than their counterparts in Gosford or Wyong (where there were severe water shortages

[14] The 2008 survey did not ask households in Gosford or Wyong to answer questions about garden watering, because the water restrictions that were in place did not permit any garden watering (with mains water). There were no restrictions in place in the Hunter area. The 2006 Sydney survey only asked about watering gardens with hand-held hoses during the hours permitted by the restrictions that were in place at the time.

and strict water restrictions).[15] But they were more likely to use these sources of water than households in the Hunter area (which did not face any water shortages and therefore had no water restrictions in place). Very few households in Sydney used bore water.[16]

Sydney households that used grey water on average used less water than households that used only mains water. However, households that used water from rain water tanks on average used *more* water than households that used only mains water. The reason for this is probably because of other characteristics associated with these households, such has having more occupants, living on larger blocks of land (and therefore to have larger gardens) and having swimming pools. Most households that used grey water and water from rain water tanks used it for outdoor use.

Tenants' payment arrangements do not much affect water consumption

Tenants' payment arrangements do not seem to have much impact on water consumption. The amount of water that tenants consume seems to depend mainly on the number of occupants per household, rather than whether or not they pay the usage charges.

1.2.3 The relationship between income, consumption and payment difficulties

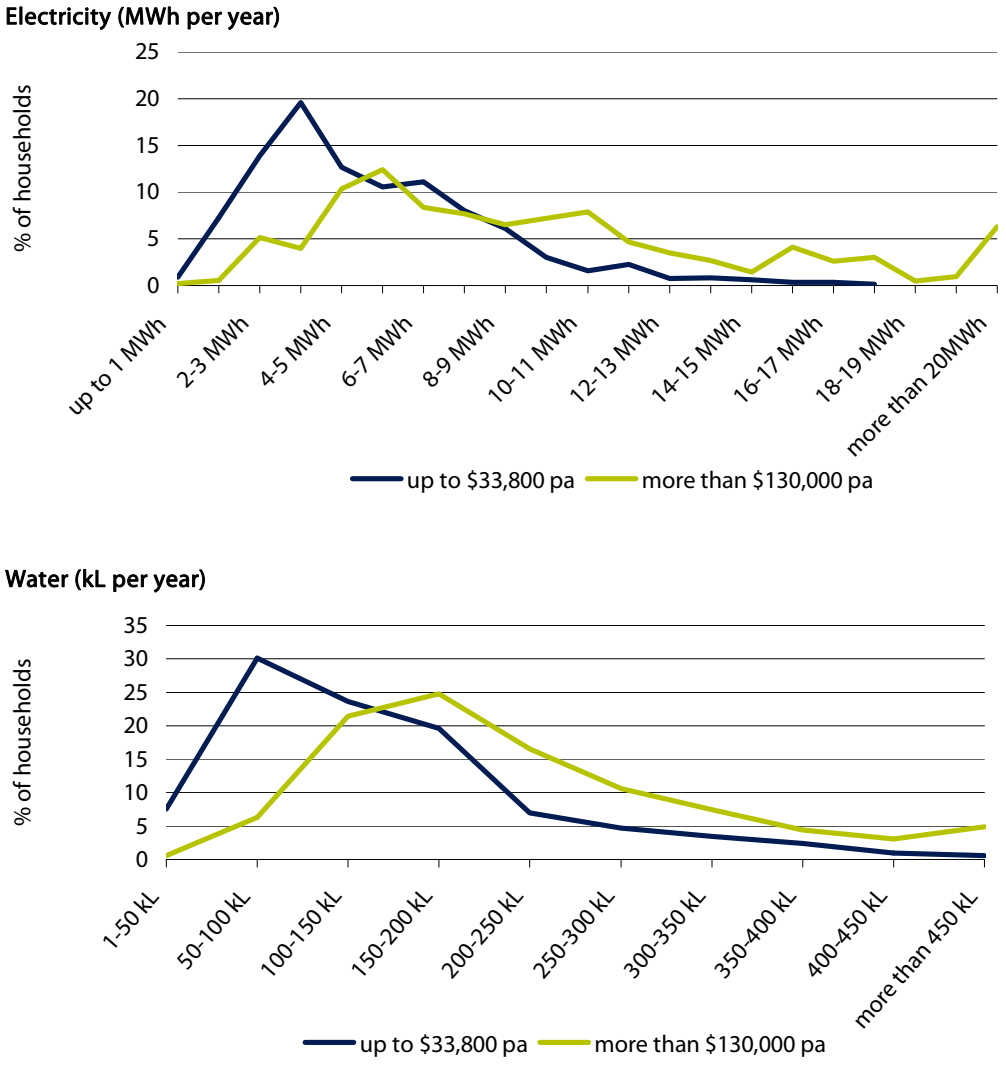
Relationship between income, consumption and vulnerability to price increases

A household's income can influence its consumption of electricity, gas and water, as well as its ability to pay for these services. The survey asked a number of questions about income and payment difficulties and found that, in general, lower income households consumed less electricity and water than higher income households. The reasons for this include that low-income households tended to have fewer occupants, were less likely to own items such as clothes dryers, dishwashers, 2nd refrigerators and swimming pools, and were less likely to live in free-standing houses. However, like in Sydney in 2006 and the Hunter, Gosford and Wyong areas in 2008, there were significant numbers of both large and small users within each income category. (Figure 1.3)

15 Very few households in semi-detached dwellings or flats used water from rain water tanks although some used grey water.

16 We were unable to investigate changes in the use of alternative sources of water in Sydney between 2006 and 2010 because the 2006 survey did not ask these questions.

Figure 1.3 Frequency distribution of electricity and water consumption by consumption band, for low income and high-income households, Sydney (2010) (%)



In both survey regions, most low-income households held a concession card entitling them to rebates on their utilities bills (78% in Sydney in 2010 and 86% in the Hunter, Gosford and Wyong areas in 2008). In both regions, most of these households were aware that they could claim rebates, and did claim them. Nevertheless, more than 20% of households that held a concession card in Sydney did not claim rebates. (Note that tenants do not qualify for water and sewerage rebates because they do not pay the fixed charges for these services directly to their water utilities.)

Low-income households that do not hold a concession card constitute only a small proportion of total households (around 5% in both survey areas). However, these households may be even more vulnerable to utility price increases than low-income households that do hold a concession card. The reasons for this include that they do not qualify for rebates; they tend to use more energy and water (mainly because they

have more occupants); and they are more likely to be renting privately or paying off their homes, and therefore face higher accommodation costs.

Payment difficulties

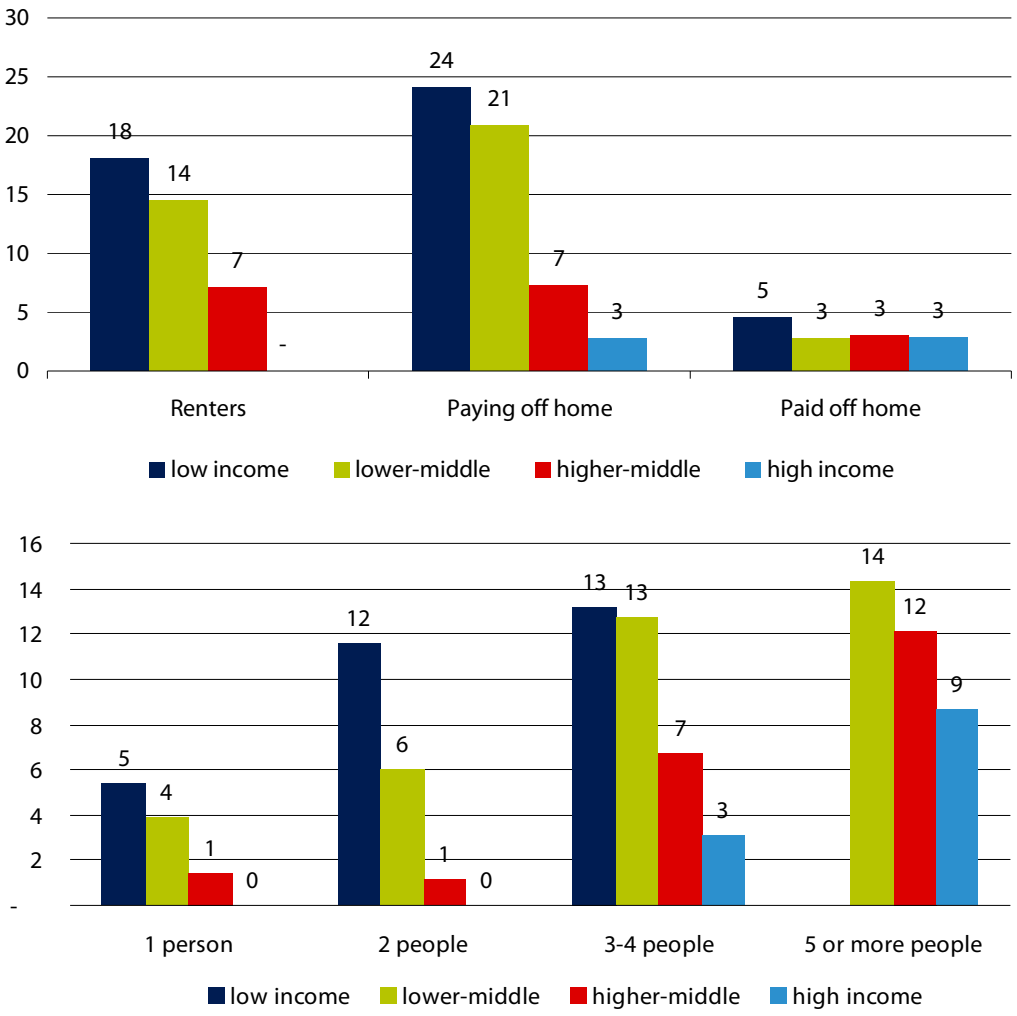
Households both in Sydney and in the Hunter, Gosford and Wyong areas were more likely to experience financial difficulty paying their electricity bills than their water or gas bills. Only 3% of low-income households in Sydney (2010) indicated they felt had financially unable to pay their water bills in the past year, compared to 16% that indicated they felt had financially unable to pay their electricity bills. They were also more likely to approach their electricity supplier because they could not pay their bill. Electricity bills are more difficult to pay than water bills because they tend to be larger, attract lower rebates, and are paid in full by renters (who only pay the usage component of water bills).

Low-income households in Sydney (2010) were more likely to experience payment difficulties and approach their suppliers than middle-income or high-income households. This differs from our 2008 findings in the Hunter, Gosford and Wyong areas, where we found a similar proportion of low- and middle-income households had experienced payment difficulties.

Further analysis of payment difficulties confirms that income is only one of the factors that affect the likelihood of a household experiencing financial difficulties paying utility bills. In particular, we found that such households were also more likely to:

- have 3 or more occupants (and therefore to consume more and face higher utility bills)
- be renting or paying off their homes (and therefore to face higher accommodation costs), and
- to use large amounts of electricity (more than 8 MWh per year) (Figure 1.4).

Figure 1.4 Proportion of households that had approached their electricity supplier in the last 3 years because they had experienced financial difficulty paying bills, Sydney (2010) (%)[a,b]



a The result for low-income households paying off their homes need to be interpreted with caution due to a small sample size of households in the category (29).

b Low-income households with 5 or more occupants have been excluded due to a small sample size.

The most common response by suppliers to being approached by a customer about payment difficulties is to extend the due date of the bills. Very few households had their electricity or gas disconnected or their water flow restricted. Only a small number of households had received Energy Payment Assistance Scheme (EAPA) or Payment Assistance Scheme (PAS) vouchers in the previous 3 years to help pay utility bills.[17]

[17] The NSW Government funds a program to help financially disadvantaged people who are experiencing payment difficulties because of a crisis or emergency situation. Community welfare organisations, such as St Vincent de Paul and the Salvation Army, distribute the vouchers on behalf of the NSW Government. Box 8.2 provides more information about the schemes.

Payment difficulties in Sydney since 2006

We asked households in both 2006 and 2010 whether they had approached their electricity, gas or water supplier because they had experienced difficulty paying their bills.[18] We expected to see an increase in the proportion of households that had approached their supplier, because electricity prices increased significantly between 2006 and 2010. Also, the Energy and Water Ombudsman (EWON) has indicated that, over the past year, 'financial hardship and anxiety over the affordability of energy bills has resulted in an increase in billing and credit related complaints to EWON'.[19]

However, we found that a *smaller* proportion of households reported they had approached their electricity or gas suppliers in 2010 compared to 2006. The explanation for this may lie in the fact that the 2006 survey asked *all* respondents whether they had approached their supplier because they were unable to pay their bill, whereas the 2010 survey asked only respondents whose response to an earlier question indicated that they had experienced financial difficulty paying utility bills. Evidence from the 2008 survey in the Hunter, Gosford and Wyong areas suggests that some respondents may indicate they have not had financial difficulty paying these bills even though they sought some form of assistance (or perhaps *because* they had sought assistance and hence avoided payment difficulties).[20] Also, the 2006 survey may have captured people who had trouble paying their bills for reasons other than financial stress, such as technical difficulties with a credit card. The 2010 survey specifically asked people whether they had felt *financially* unable to pay their bills.

1.2.4 Public transport and access to private vehicles

We asked survey respondents whether anyone in their household had used a bus, train, ferry or taxi in the previous 7 days, and whether this travel was free school travel under the NSW Government's School Student Transport Scheme (SSTS). We also asked households how many private vehicles they had.

Public transport and who uses it

We found that bus and train travel are by far the most common forms of public transport, and that most households use public transport as fare-paying passengers (rather than free school travel). High-income households and households with

18 In 2006 we did not ask households whether they had experienced financial difficulty paying their bills, only whether they had approached their supplier.

19 Energy and Water Ombudsman, *2009/10 Annual Report*, p 25.

20 This possibility is suggested by the finding of the 2008 survey in the Hunter, Gosford and Wyong areas that more than 60% of respondents who had received Energy Payment Assistance Scheme (EAPA) vouchers to help pay their energy bills reported that they had not experienced financial difficulty paying their bills (we could not do the same analysis for Sydney because the 2010 survey only asked respondents who said they had experienced difficulty paying their bills whether they had received EAPA vouchers. The 2006 survey did not ask about EAPA vouchers).

children were more likely to have used public transport than low-income households and 1 or 2 person households with no children living at home.

Regarding STSS travel, we found that low-income households with school-aged children were more likely to have made use of SSTS travel than households with school-aged children in the higher income groups.

Including free school travel, about 60% of households had used a bus, train and/or ferry in the previous 7 days. However, the proportion of households that use public transport in specific an area depends partly on how well the area is served. This proportion varied from 82% of households in the North Sydney/Manly area to 32% in Lake Illawarra. Only 5% of households had used a taxi.

Access to private vehicles and the implications of this for public transport use

As expected, we found that higher income households on average had more vehicles than lower income households, and that couples with children on average had more vehicles than other household types. Lone person households had the lowest average number of vehicles.

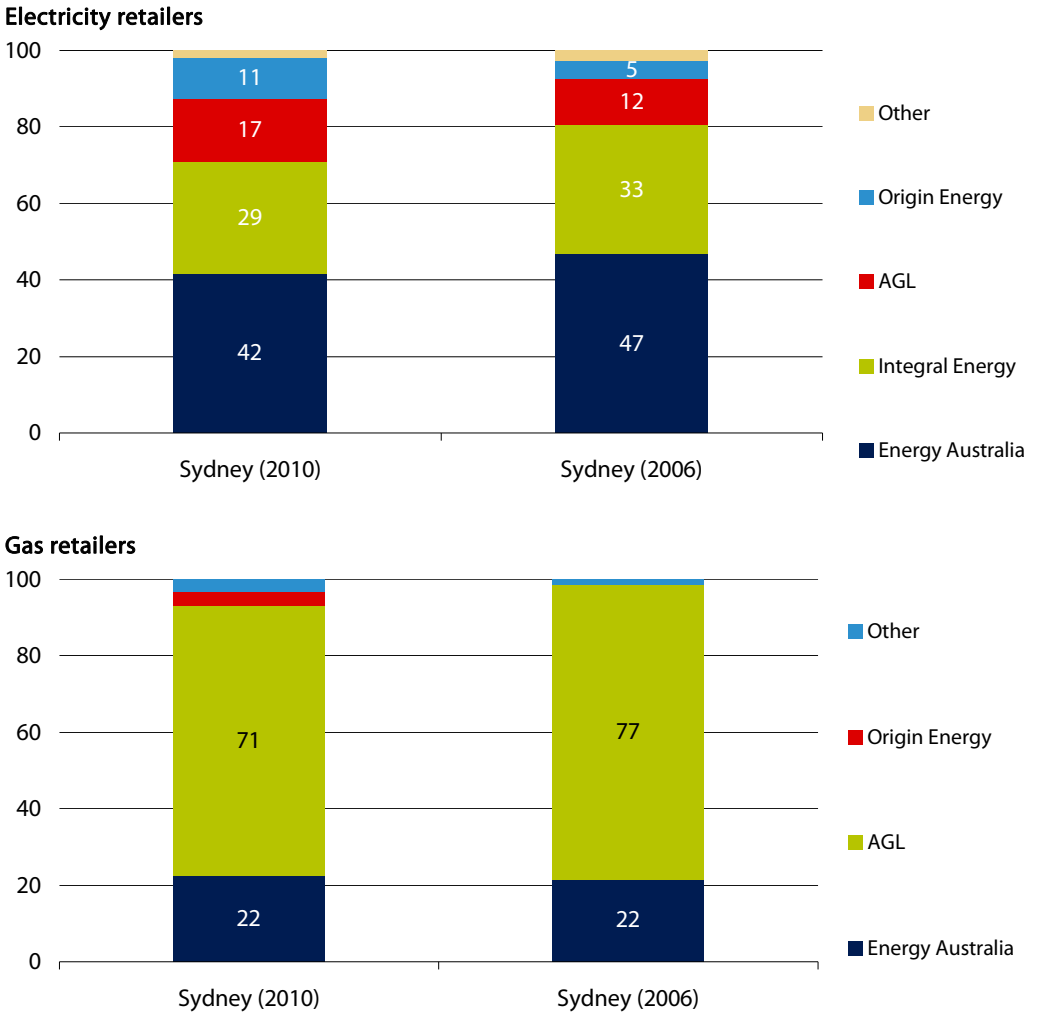
We also found that households tended to have more vehicles in areas where public transport use was low. Conversely, households tended to have fewer private vehicles in areas where public transport use was high. However, more than half of households with at least 1 private vehicle also used public transport, suggesting that access to a private vehicle is only one of many factors that determine public transport use in Sydney.

1.2.5 Household's experience of the energy markets

Full retail competition (FRC) for electricity and gas was introduced in NSW on 1 January 2002, and most respondents to the 2010, 2008 and 2006 surveys were aware of this. But surprisingly, the proportion of respondents in Sydney who knew they could choose their gas supplier was significantly lower in 2010 than in 2006 (77% compared to 94%). The reasons for this decline in awareness are unclear.

The pre-FRC electricity retailers (EnergyAustralia and Integral Energy) and the pre-FRC gas retailer (AGL) still dominate the Sydney market. However, each of these retailers has lost about 5% of market share since 2006. AGL and Origin Energy are the main alternative electricity retailers. EnergyAustralia is the main alternative gas retailer, but its share of the Sydney market has remained steady and this retailer appears to have been more active in the Hunter, Gosford and Wyong areas than in Sydney. Origin Energy was the fastest growing alternative gas retailer (Figure 1.5).

Figure 1.5 Proportion of electricity and gas customers supplied by the different retailers (%)



There seems to have been less activity in the Sydney market in the 3 years prior to the 2010 survey than in the period 2002 to 2006, particularly in the gas market:

- Far fewer households entered a market contract with their existing electricity retailer between 2007 and 2010 (8%, compared to 24% between 2002 and 2006). Similar proportions of households were approached about entering market contracts during the 2 periods (about 75%). The only increase in activity has been in the proportion of households who changed their electricity retailer (18% between 2002 and 2006 and 23% between 2007 and 2010).

- Far fewer households with mains gas were approached about gas contracts between 2007 and 2010 than between 2002 and 2006 (33% compared to 61%). Also, fewer households entered a market contract with their existing gas retailer in the 2007 to 2010 period (4% compared to 16%). The level of switching to another retailer following an approach to switch was low in both periods (less than 10%).

Since January 2002, 42% of households had switched their electricity retailer, and 24% of households with mains gas had switched their gas retailer for any reason other than moving house. Most of these households had switched retailers only once, and very few had switched more than twice.

Only a very small proportion of respondents said they had actively approached an energy retailer about entering into a contract. This was also true in the Hunter, Gosford and Wyong areas in 2008.

Of households that accepted an offer to enter into a contract, most said the main reason they did so was because they believed it was cheaper. However, less than 30% of Sydney households felt that their bills were lower as a consequence of going onto a contract.

Of households that had chosen not to accept an offer to switch retailer or to enter a contract with their existing retailer, most said the main reason was because they were happy with their existing arrangements. However, not wanting to be locked into a contract seems to have become far less of an impediment to accepting an offer since 2006: significantly fewer households gave this as their main reason for not accepting an offer in 2010 compared to 2006 (eg, 5% compared to 17% of electricity customers). Instead, a higher proportion of households in 2010 did not change their existing arrangements simply because they saw no good reason to do so (ie, their responses indicated they were happy with existing arrangements or it was 'too much trouble').

Households that had entered into a contract in the past 3 years were asked about their level of satisfaction with their contract. For both electricity and gas, about 65% of households indicated that they were satisfied with the new arrangements, while 20% said they were dissatisfied with their electricity contract and 13% were dissatisfied with their gas contract. In 2008, households in the Hunter, Gosford and Wyong areas had expressed greater levels of satisfaction and less dissatisfaction, particularly with their electricity contract. (The Sydney 2006 survey did not ask this question.)

Residential customers appear to be fairly confident in their ability to choose a retailer, a little less confident that they have the information they need, and least confident about the process of transferring. The on-line price comparator recently made available on the IPART website should help to improve confidence, by providing households with up-to-date information about what contracts are available as well as their prices.

1.3 Structure of the report

The following chapters present the results of the 2010 survey in more detail and, where appropriate, compare them with the results for the 2008 survey in the Hunter, Gosford and Wyong areas and the 2006 survey in Sydney:

- Chapter 2 provides a brief description of the survey and some of the terms used in this report.
- Chapter 3 provides a comparative profile of households in these 2 survey areas and identifies changes in supply conditions in Sydney between 2006 and 2010 that may have had an impact on energy and water use.
- Chapters 4 to 6 provide profiles of household consumption patterns for electricity, gas and water, with a particular focus on understanding the key characteristics of high and low consumption households.
- Chapter 7 investigates the relationship between electricity, gas and water consumption and household income.
- Chapter 8 investigates the relationship between payment difficulties and household income and other characteristics.
- Chapter 9 discusses the survey findings in relation to public transport and private vehicles.
- Chapter 10 discusses the survey findings in relation to the experience of retail competition in the residential energy market.

In addition, Appendix A provides an overview of the survey design and methodology, and Appendix B provides information about the suburbs included in the survey sample. Appendix C provides the explanatory letter and consent forms presented to participating households and Appendix D provides the survey questionnaire. Appendix E provides detailed tables on the 2010 survey results, and can be found on the IPART website at http://www.ipart.nsw.gov.au/investigation_content.asp?industry=6&sector=17&inquiry=202

2 Description of the survey

The 2010 survey is briefly described below, followed by an explanation of the income categories used in this report. A more detailed description of the survey design and methodology is provided in Appendix A.

2.1 Description of the survey

The 2010 household survey was conducted between January and March 2010. Interviews were completed and a full set of utility data were obtained for 2,192 households,[21] including 1,866 in the Sydney metropolitan area, 242 in the Illawarra and 84 in the Blue Mountains.

We engaged Taverner Research (Taverner) to undertake interviews with resident households on our behalf. Taverner was also responsible for obtaining consumption data from the relevant energy and water utilities.

Taverner used a computer aided telephone interviewing (CATI) methodology for the survey, instead of the door-to-door (face-to-face) methodology used in previous household surveys.[22] The CATI approach was adopted because:

- it is significantly cheaper than the door-to-door methodology
- it avoids the sampling bias that arises because door-to-door interviewers often cannot access multi-dwelling complexes (such as apartment blocks) that have security systems.

After the interviews were conducted, we sought respondents' consent via post for their water, gas and electricity suppliers to provide their billing data to us for inclusion in our analysis.[23]

Box 2.1 provides definitions of the survey areas for the 2010 and previous surveys and related terms used in this report. Figure 2.1 provides a map of the Sydney Water's area of operation.

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21 We subsequently excluded water consumption data for 3 households, giving a total sample size of 2,189 for our analysis of water consumption.

22 Due to unexpected delays during the 2008 survey in the Hunter, Gosford and Wyong areas, some of the interviews were conducted using the CATI method.

23 We obtained electricity and gas consumption data from the network operators (not the retailers). Sydney Water provided the water consumption data.

Box 2.1 The survey areas, and definitions of related terms used in this report

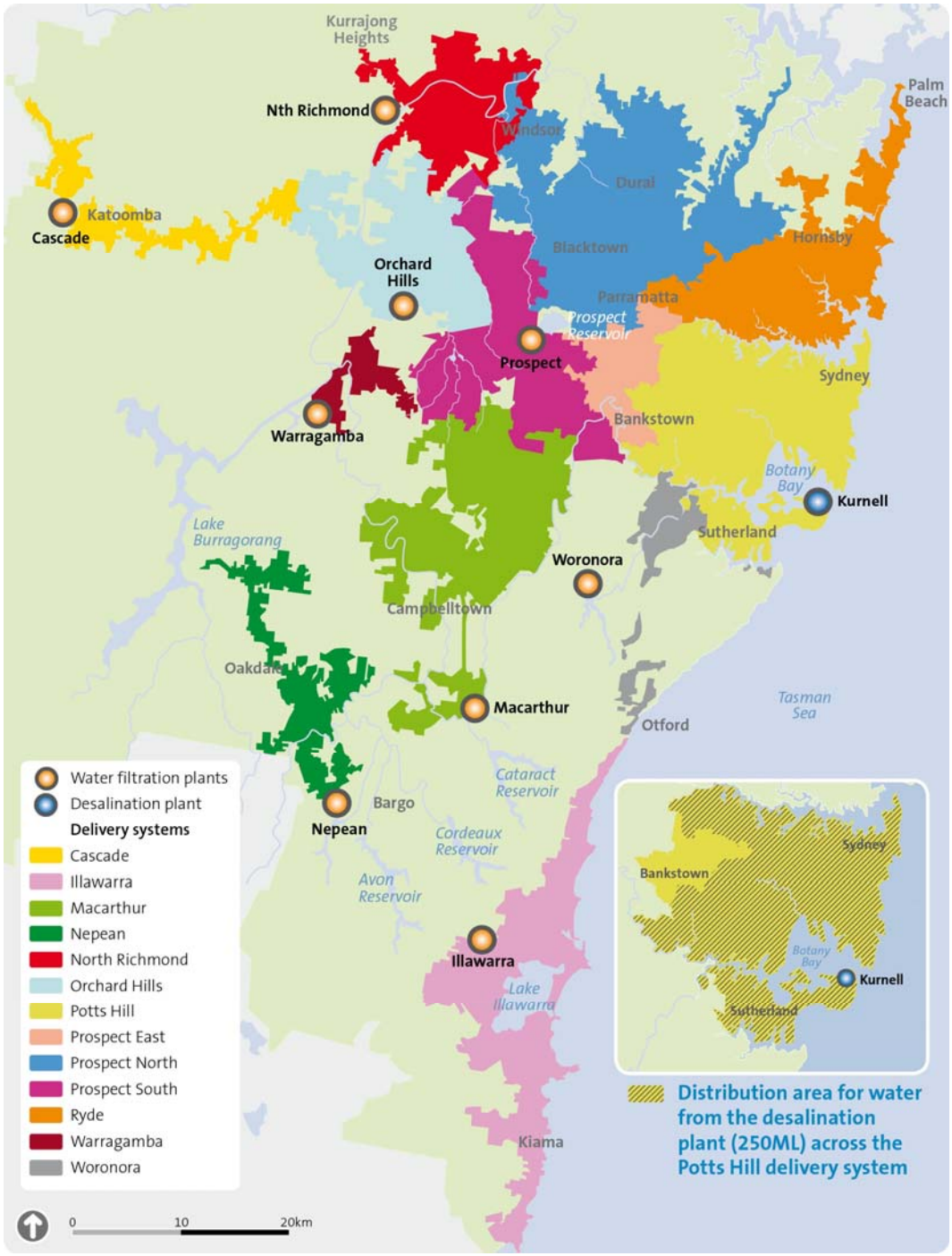
Our 2010 survey area corresponds with Sydney Water's area of operation, which includes the Sydney metropolitan area, the Blue Mountains and the Illawarra. The Sydney metropolitan area is far bigger than the other 2 areas, and 85% of our survey sample was drawn from this area. Only 4% and 11% was drawn from the Blue Mountains and the Illawarra respectively.

In this report:

- 'Sydney' refers to the whole of Sydney Water's area of operation. In some sections, we discuss the Sydney metropolitan area, excluding the Blue Mountains and the Illawarra. In such cases, the area is referred to as the 'Sydney metropolitan area'.
- 'The Hunter, Gosford and Wyong areas' refers to the areas where water is supplied by Hunter Water Corporation, the Gosford City Council and the Wyong Shire Council. The area supplied by Hunter Water Corporation includes the local government areas of Newcastle, Maitland, Lake Macquarie, Cessnock and Port Stephen.
- 'Sydney (2010)' refers to 2010 survey data for the Sydney Water supply area, while 'Sydney (2006)' refers to 2006 survey data for the Sydney Water supply area, and Hunter, Gosford and Wyong (2008) refers to 2008 survey data for the Hunter, Gosford and Wyong water supply areas.

Appendix B provides more details on the locations included within Sydney Water's area of operation.

Figure 2.1 Sydney Water's area of operation



Data source: Sydney Water website
http://www.sydneywater.com.au/OurSystemsandOperations/images/WaterSystem.jpg

2.2 How we have defined income groups

During the 2006, 2008 and 2010 surveys we asked respondents to provide their annual (or weekly) household incomes before tax, including income from all sources. The questionnaires provided 9 income bands to choose from. For example, the lowest band was less than $13,000 per year ($250 per week) and the highest band was more than $156,000 per year ($3,000 per week) for the 2010 survey.

To simplify our analysis we consolidated these bands into 4 income categories, namely low-income, lower-middle income, higher-middle income and high-income. The table below shows the how we grouped the income bands into these categories.

Note that the income bands for the 2010 survey were updated using the latest available ABS income distribution data for the Sydney region. This means they are different to those used in 2006 and 2008.

Table 2.1 Definition of income categories used in this report

Income category	Sydney (2010)	Sydney (2006) and Hunter, Gosford and Wyong (2008)
Low-income	Less than $33,800 per year *($649 per week)*	Less than $31,200 per year *($600 per week)*
Lower-middle income	$33,800 to $62,400 per year *($649 to $1,199 per week)*	$31,200 to $52,000 per year *($600 to $1,000 per week)*
Higher-middle income	$62,400 to $130,000 per year *($1,119 to $2,499 per week)*	$52,000 to $104,000 per year *($1,000 to $2,000 per week)*
High-income	More than $130,000 per year *($2,499 per week)*	More than $104,000 per year *($2,000 per week)*

3 Profile of households and changes in utility supply conditions

The demographic, socio-economic and physical characteristics of the households in an area can have a significant impact on the patterns of residential water and energy consumption in that area, as well as on households' payment difficulties.

We used the data from our 2010 household survey and the 2006 Census to develop a profile of typical households in the Sydney metropolitan area, the Blue Mountains and the Illawarra. We focused on several characteristics, including household size and income, and the type of dwelling lived in. We also compared these characteristics with those of typical households in the Hunter, Gosford and Wyong areas (based on data from the 2008 household survey and the 2006 Census).[24] In addition, we identified changes in water and energy supply conditions in Sydney that may have affected household consumption patterns since we conducted our previous Sydney survey in 2006.

We found that the profile of typical households in the Sydney metropolitan area differs from that in the Illawarra and the Hunter, Gosford and Wyong areas in several important ways. The profile of typical households in the Blue Mountains is more like that of Sydney households than the Illawarra in some ways. The profile in the Illawarra is fairly similar to that in the Hunter, Gosford and Wyong areas. We also found that, compared to all the other areas, the Sydney metropolitan area has a far smaller proportion of free-standing houses than the other areas, and a larger proportion of flats and semi-detached dwellings.

Since 2006, Sydney households have seen changes in water restrictions as well as fairly significant increases in electricity and water prices. They have also seen the introduction or strengthening of various schemes designed to encourage energy and water savings. Partly as a consequence of these changes in supply conditions, on average households have reduced their energy and water consumption, and in particular their energy consumption.

The sections below discuss these findings in more detail.

[24] IPART, *Residential energy and water use in Hunter, Gosford and Wyong - Results from the 2008 household survey*, December 2008.

3.1 Household characteristics

We compared the age profile, household size and structure and household income of the population of the 2010 and 2008 survey areas, and the individual statistical regions within the Sydney area. We also compared the concession card status of the households we surveyed, and the proportions of different dwelling types in these areas.

3.1.1 Age profile

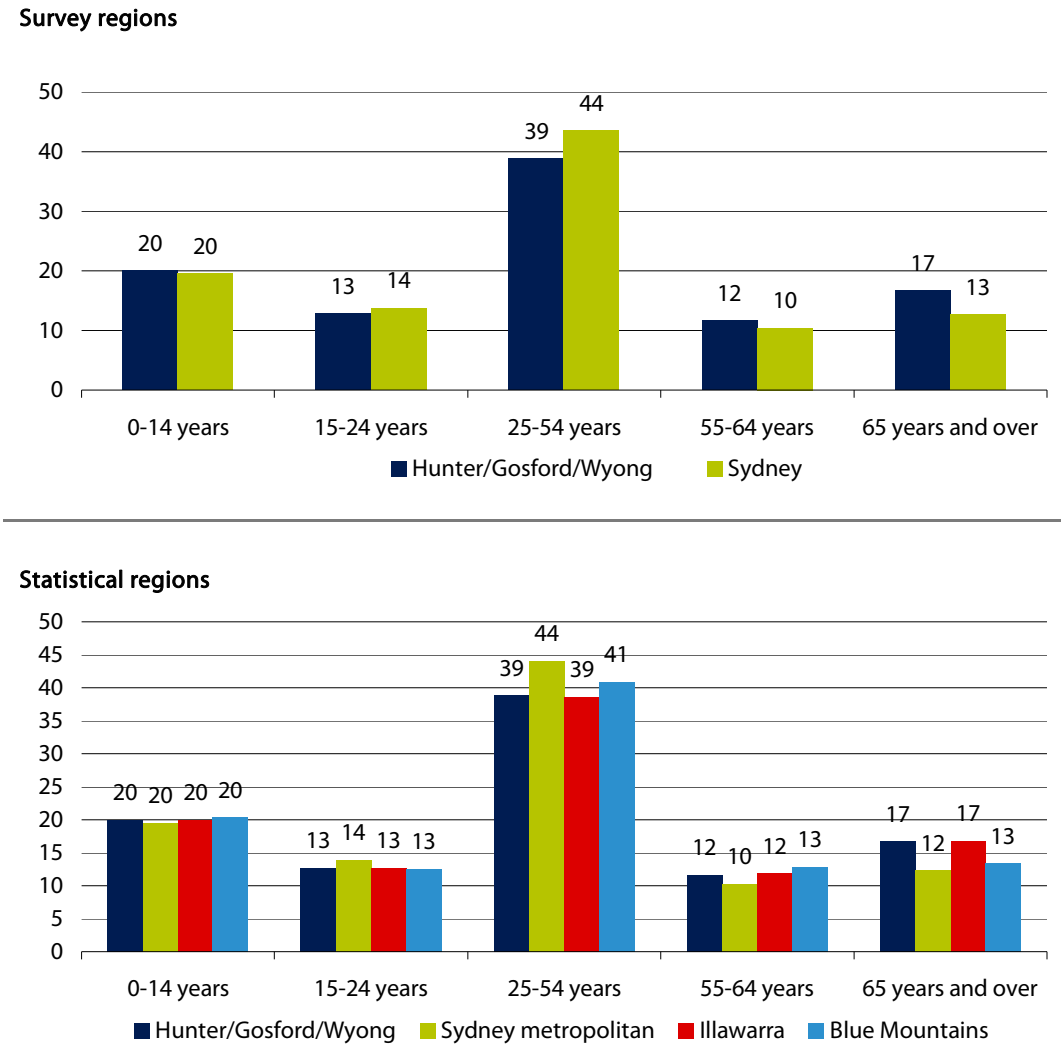
At the time of the 2006 Census,[25] the Sydney area had a younger age profile than the Hunter, Gosford and Wyong areas. For example, 77% of Sydney's population was younger than 55 years, compared to 72% of the population in the Hunter, Gosford and Wyong areas (Figure 3.1).

Looking at the individual statistical regions, a higher proportion of the population in the Sydney metropolitan area was aged between 25 years and 54 years than in all other areas, and a lower proportion was aged over 65 years. For example:

- 44% of the population in the Sydney metropolitan area was between 25 years and 54 years, compared to 39% in the Illawarra and the Hunter, Gosford and Wyong areas, and 41% in the Blue Mountains.
- 12%of the population in the Sydney metropolitan area was 65 years or older, compared to 17% in the Illawarra and the Hunter, Gosford and Wyong areas, and 13% in the Blue Mountains.

25 *Australian Census of Population and Housing*. Census data are available on the Australian Bureau of Statistics' website at www.abs.gov.au/websitedbs/D3310114.nsf/home/Census+data

Figure 3.1 Age profile of populations (2006 Census)



Data source: ABS, 2006 Census QuickStats, for Hunter (Statistical Division), Gosford-Wyong (Statistical Subdivision), Illawarra (Statistical Division), Sydney (Statistical Division) and Blue Mountains (Statistical Local Area).

3.1.2 Household size and structure

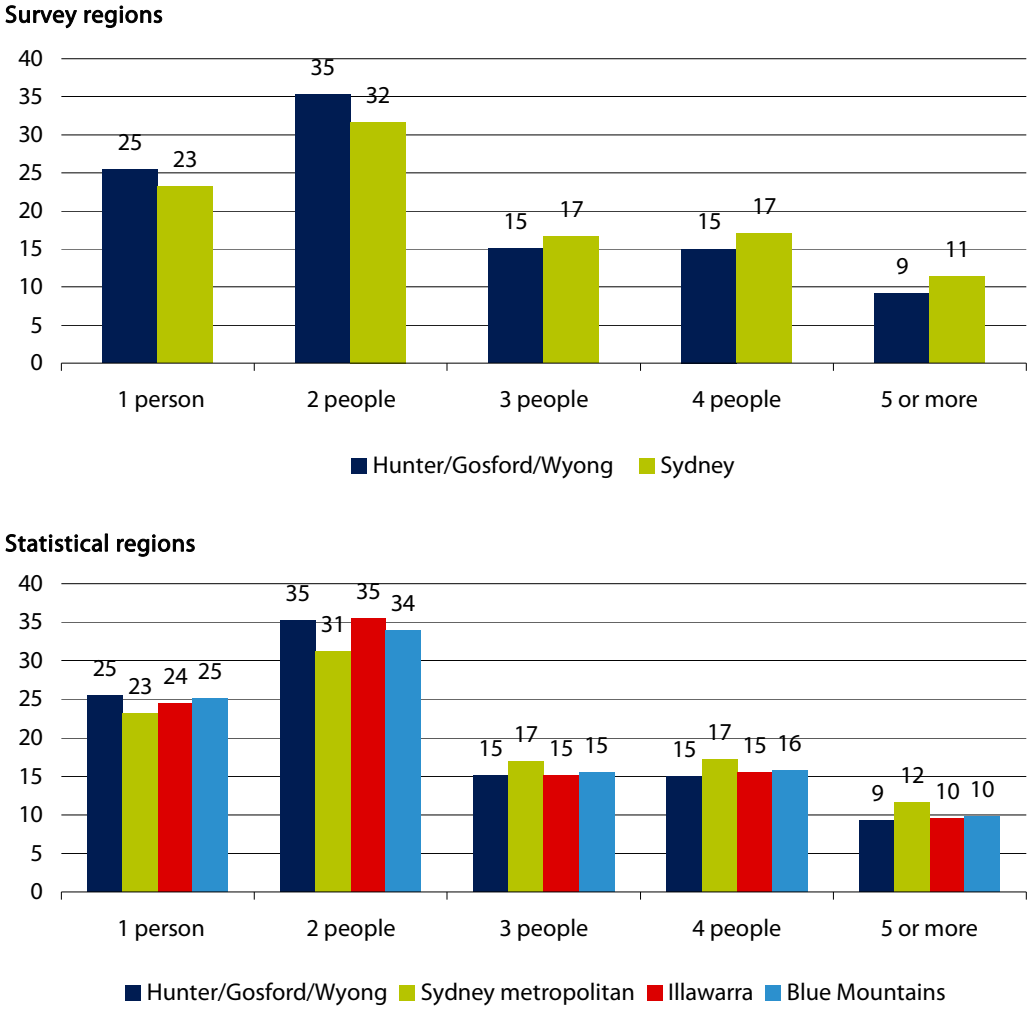
At the time of the 2006 Census, the Sydney area had a smaller proportion of households with 1 or 2 occupants than the Hunter, Gosford and Wyong areas (Figure 3.2), and a higher proportion of households comprising couple families with children (Figure 3.3).

Of the individual statistical regions, Sydney metropolitan area had the smallest proportion of households with 1 or 2 occupants and the highest proportion of households comprising couple families with children. In particular, in this area:

- 54% of households had 1 or 2 occupant compared to about 60% in the Illawarra, the Blue Mountains and the Hunter, Gosford and Wyong areas.

- 36% of households were couple families with children, compared to just over 30% in the Illawarra and the Hunter, Gosford and Wyong areas and 33% in the Blue Mountains.

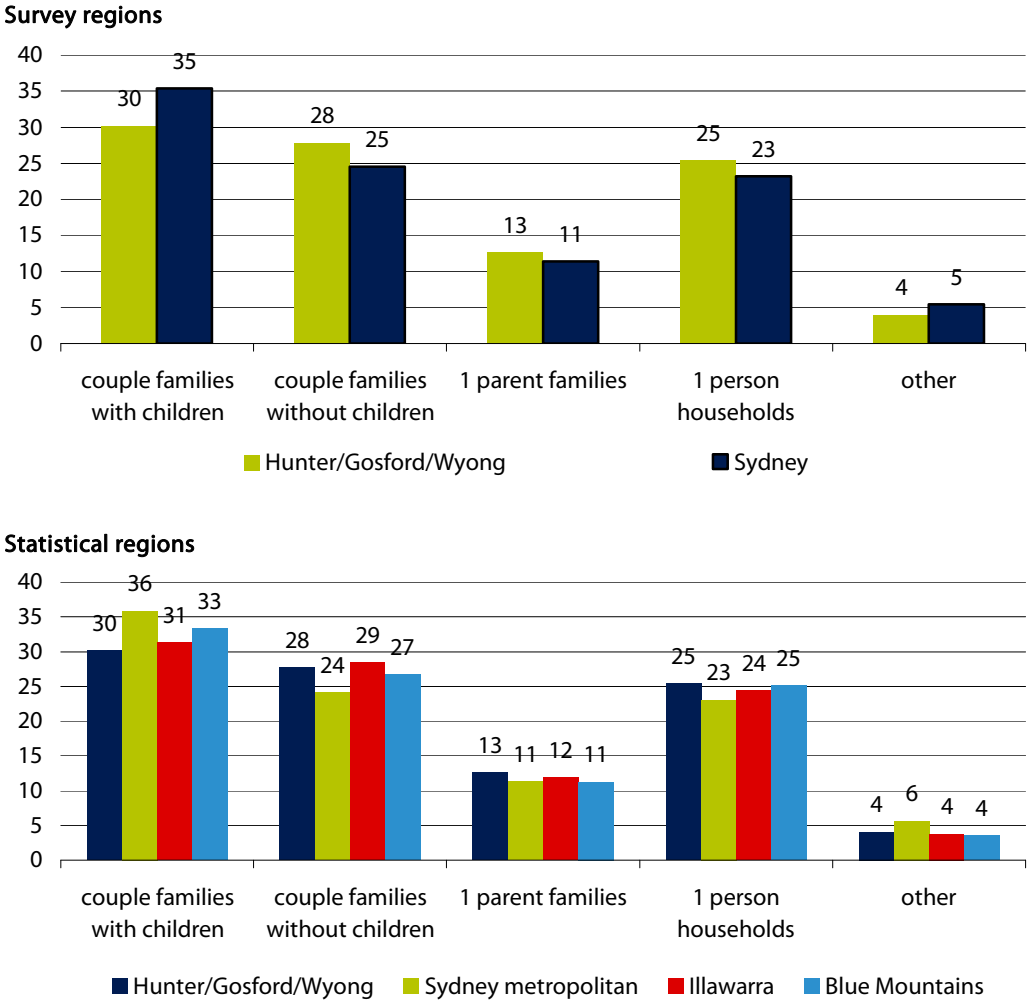
Figure 3.2 Household size – number of usual residents (2006 Census)[a]



[a] Includes 'Families', 'Lone Persons' and 'Group Households'.

Data source: ABS, 2006 Census , Basic Community Profile, Table B30, Household composition by number of persons usually resident, for Hunter (Statistical Division), Gosford-Wyong (Statistical Subdivision), Illawarra (Statistical Division), Sydney (Statistical Division) and Blue Mountains (Statistical Local Area).

Figure 3.3 Percentage of household types in different categories (2006 Census) (%)



Note: Household types in occupied private dwellings. Family types estimated using 'Family characteristics' (which includes households in all dwelling types).

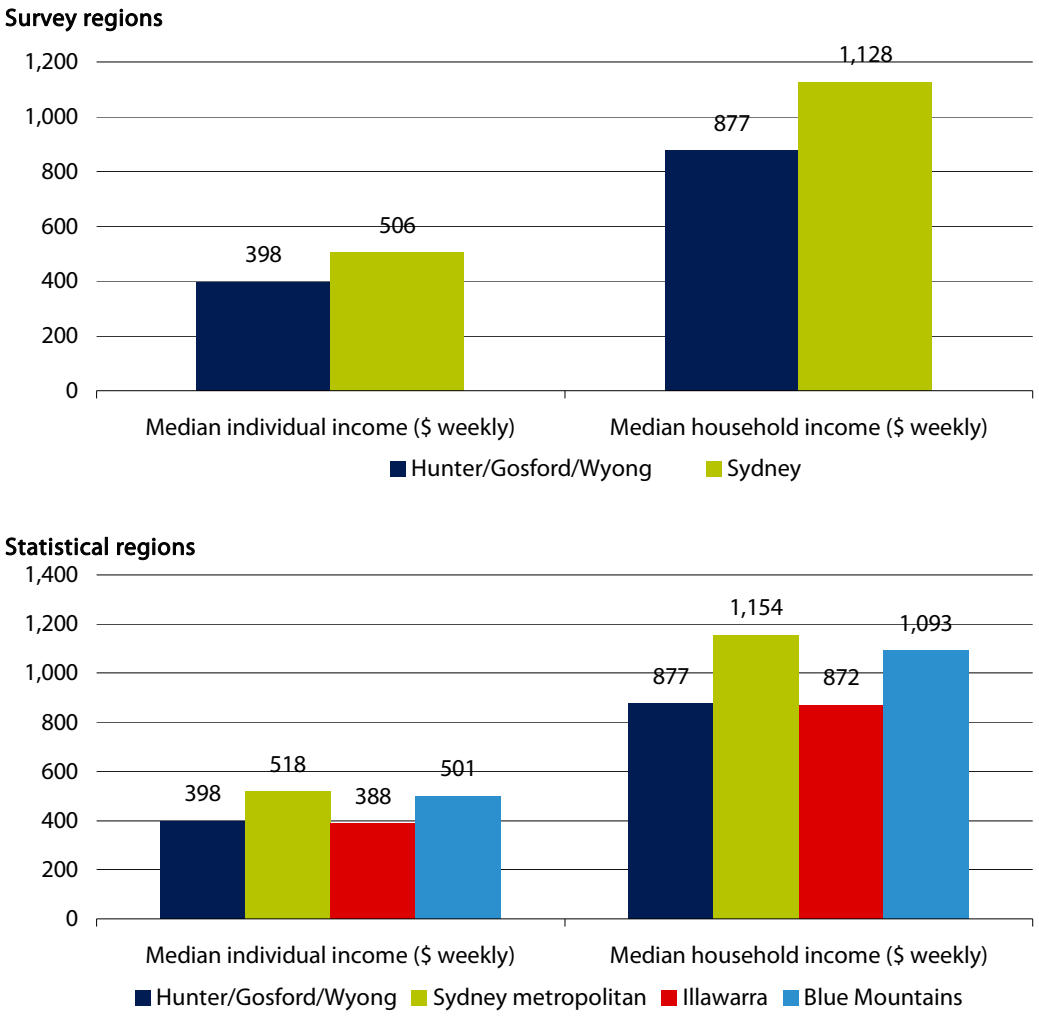
Data source: ABS, 2006 Census QuickStats, for Hunter (Statistical Division), Gosford-Wyong (Statistical Subdivision), Illawarra (Statistical Division), Sydney (Statistical Division) and Blue Mountains (Statistical Local Area).

3.1.3 Household income

In 2006, the median household income in the Sydney area was $1,128 per week, compared to only $877 per week in Hunter, Gosford and Wyong areas (Figure 3.4).

The Sydney metropolitan area had the highest median income of all the individual statistical regions, both at the individual and household level, and this income was significantly higher than that in the Illawarra and the Hunter, Gosford and Wyong areas (Figure 3.4).

Figure 3.4 Median individual and household income (2006 Census) ($ per week)

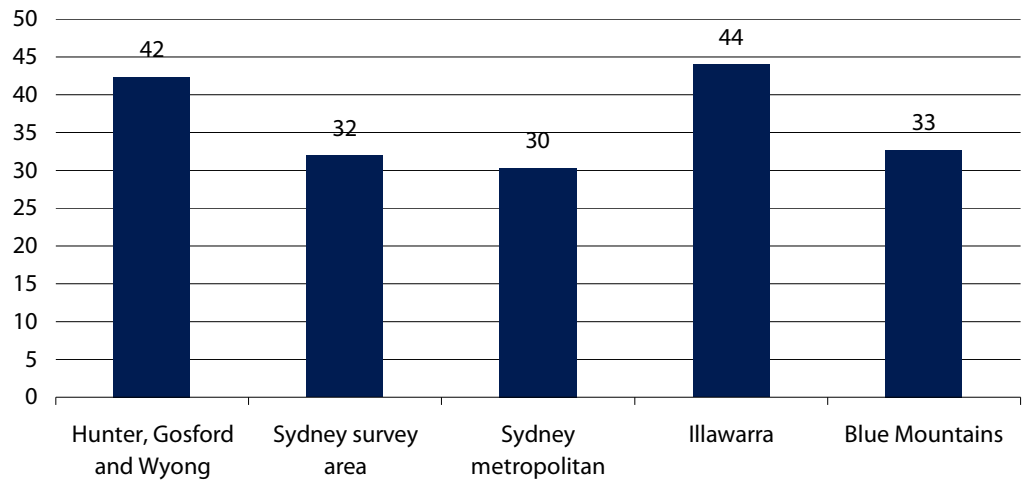


Data source: : ABS, 2006 Census QuickStats, for Hunter (Statistical Division), Gosford-Wyong (Statistical Subdivision), Illawarra (Statistical Division), Sydney (Statistical Division) and Blue Mountains (Statistical Local Area).

3.1.4 Concession card status

Our household surveys asked respondents whether someone in their household held a concession card. The surveys found that a smaller proportion of households in the Sydney area held a concession card than in the Hunter, Gosford and Wyong areas (32% compared to 42%). The areas with the smallest proportions of such households were the Sydney metropolitan area (30%) and the Blue Mountains (33%). This reflects the lower proportion of retiree/pensioner households in these statistical regions (Figure 3.5).

Figure 3.5 Proportion of households with concession cards (%)



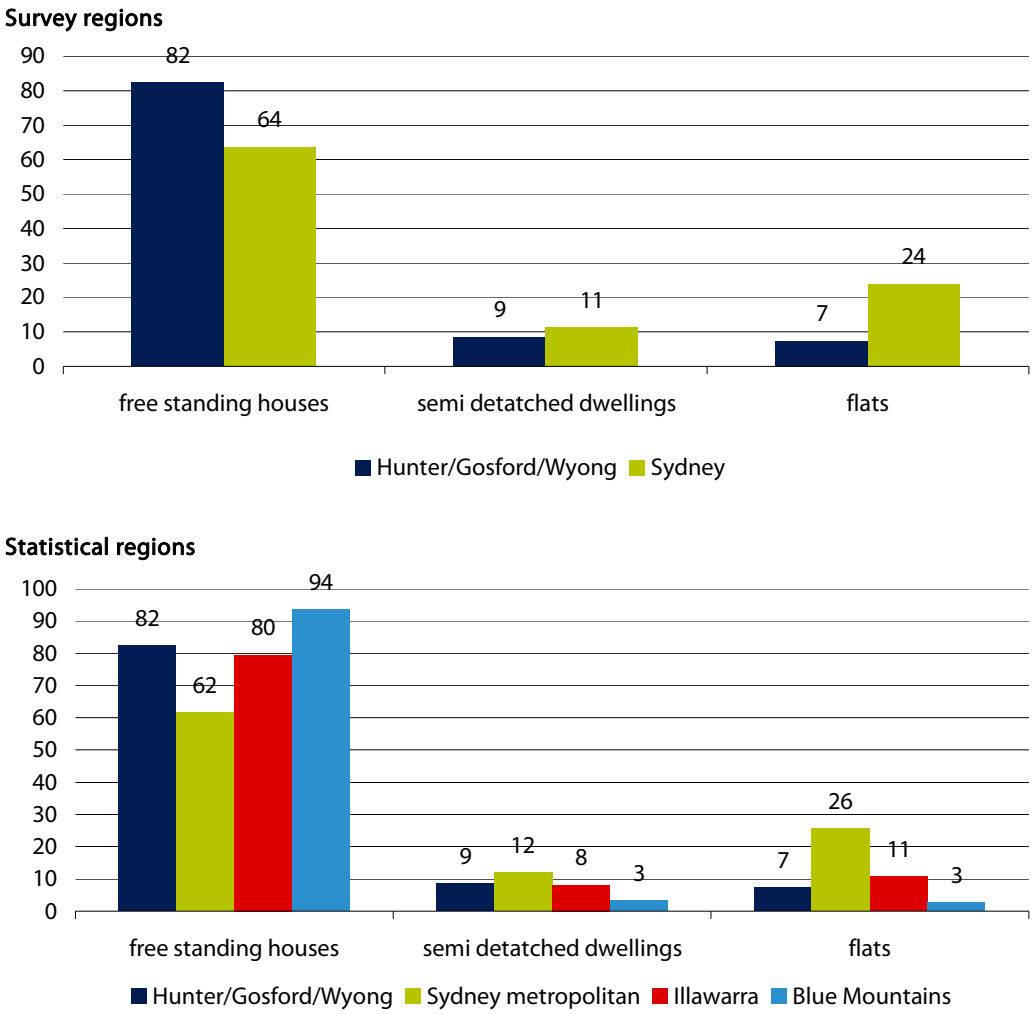
Data source: 2010 IPART household survey (Sydney) and 2008 IPART Household Survey (Hunter, Gosford and Wyong).

3.1.5 Dwelling types

At the time of the 2006 Census, the Sydney area had a smaller proportion of free-standing houses than the Hunter, Gosford and Wyong areas (64% compared to 82%), and a greater proportion of flats (24% compared to 7%).

The Sydney metropolitan area had a significantly higher proportion flats than all the other areas: 26% compared to 3% in the Blue Mountains, 7% in the Hunter, Gosford and Wyong areas and 11% in the Illawarra. Conversely, the Sydney metropolitan area had a far lower proportion free-standing houses: 62% compared to 94% in the Blue Mountains, 82% in the Hunter, Gosford and Wyong areas and 80% in the Illawarra in 2006)(Figure 3.6.).

Figure 3.6 Proportion of private dwellings by dwelling type (2006 Census) (%)



Note: Occupied private dwellings. Excludes 'other/not stated' (less than 2% of the total).

Data source: ABS, 2006 Census QuickStats, for Hunter (Statistical Division), Gosford-Wyong (Statistical Subdivision), Illawarra (Statistical Division), Sydney (Statistical Division) and Blue Mountains (Statistical Local Area).

3.2 Changes in supply conditions in Sydney, 2006 to 2010

Since the 2006 survey in Sydney, there have been 3 key changes in water and energy supply conditions that may have influenced household consumption between 2006 and 2010. These changes include the easing of water restrictions, increases in rebates and other measure to encourage energy and water savings, and increases in utility prices.

3.2.1 Easing of water restrictions

Sydney Water introduced water restrictions in October 2003, and progressively strengthened them in 2004 and 2005. Restrictions were eased in June 2008, then lifted in June 2009 and replaced by Water Wise Rules. Box 3.1 discusses water restrictions in Sydney since 2003.

This means that at the time of the 2006 survey, fairly stringent (Level 3) water restrictions were in place in Sydney. The easing of restrictions since June 2008 may have encouraged an increase in average water consumption since then. Changes in residential consumption between 2003 and 2010 are discussed in section 3.3 below.

When comparing water consumption in Sydney with that in the Hunter, Gosford and Wyong areas, it is important to note that fairly stringent (Level 3) water restrictions were in place in Gosford and Wyong at the time of the 2008 survey. However, there were no water restrictions in the Hunter area.

Box 3.1 Water restrictions in Sydney

Sydney Water imposed level 1 water restrictions on 1 October 2003, and had Level 3 water restrictions in place at the time of the 2006 survey. In June 2008, it relaxed some of the restrictions. In June 2009, it lifted the restrictions altogether, and introduced Water Wise Rules. Water Wise Rules were in place during the 2010 survey.

Restrictions	Rules	Apply from
Level 1	1. No hosing of hard surfaces. 2. No sprinklers or watering systems.	1 October 2003 Dams below 60%
Level 2	Level 1 plus 3. Hand-held (garden) hosing (only) before 9am and after 5pm on Wednesdays, Fridays and Sundays. 4. No filling of new or renovated pools over 10,000L except with a permit.	1 June 2004 Dams below 50%
Level 3	Level 2 plus 5. No hoses or taps to be left running unattended, except when filling pools or containers. 6. Fire hoses used only for fire fighting purposes - not for cleaning.	1 June 2005 Dams below 40%
Level 3 changes	At home permitted to wash cars, boats, caravans, windows and walls with a hose as long as a trigger nozzle is fitted.	21 June 2008
Water Wise Rules	1. All hoses must have a trigger nozzle. 2. Garden watering is allowed before 10am and after 4pm. 3. No hosing of hard surfaces such as paths and driveways. Washing vehicles is allowed. 4. Fire hoses must only be used for fire fighting activities only.	21 June 2009 Dams above 60% for 12 months

Source: *The history of Water Wise Rules*, Sydney Water website accessed September 2010, www.sydneywater.com.au/Water4Life/WaterWise/WhenWereWaterRestrictionsIntroduced.cfm

3.2.2 Introduction of new water and energy savings schemes

A number of water and energy saving measures were introduced or strengthened by the NSW government, the Commonwealth government and Sydney Water between 2006 and 2010. Box 3.2, Box 3.3 and Box 3.4 discuss these measures.

A few of the measures were in place at the time of our 2006 survey, such at the NSW Government's rain water tank rebate (which began in 2002) and various Sydney Water initiatives. However, most of the schemes were introduced after 2006. These initiatives may have reduced the growth in consumption levels over the period 2006 to 2010, particularly electricity and water consumption (not gas).

However, note that measures introduced only in 2009 or 2010 are unlikely to have influenced average consumption for 2009/2010. They are also unlikely to have had much influence on our 2010 survey responses.

Box 3.2 NSW Government's water and energy saving measures

NSW Home Saver Rebates	
Rainwater tank	Rebate for installing a rainwater tank. Rebate amount up to $800 (October 2002 to June 2007) and up to $1,500 (since July 2007).
Hot water system	Rebate for upgrading from an electric hot water system to either a gas or a solar/heat pump hot water system. Rebate amount of up to $1,200 (July 2007 to 14 January 2010) and up to $300 (since 15 January 2010).
Dual flush toilet	$200 rebate for replacing a single flush toilet with a water efficient dual flush toilet. Rebate started on 15 January 2010.
Hot water circulator	$150 rebate for installing a hot water circulator with a new or existing instantaneous gas hot water heater. Hot water circulator recovers wasted water and sends it back into the system to be reheated or used later. Rebate started on 15 January 2010.
Washing machine	$150 rebate to buy a water efficient washing machine. Rebate started on 1 August 2008 and finished on 30 June 2010.
Ceiling insulation	Rebate covering half the cost of installing ceiling insulation, up to a maximum of $300. Rebate started on 1 October 2007 and finished on 30 June 2009.
From 15 January 2010, the total amount of NSW Home Saver Rebates a household can receive is capped at $1,500 per property.	
Other programs	
Fridge Buyback	$35 payment to remove the household's second working fridge. Fridge Buyback collects from most parts of metropolitan Sydney, the Illawarra and the Blue Mountains. It started on 1 August 2008.
Solar Bonus Scheme	Scheme provides a 'gross' feed-in tariff rate of 60 cents per kWh for the electricity generated by a household's roof-top solar photovoltaic system or wind turbines. Scheme started on 1 January 2010.
Home Power Savings Program	Concession cardholders receive a free home energy audit and action plan outlining possible changes around the home to save energy. They also receive a power saving kit (eg, efficient light globes, low-flow showerhead). Program started in early 2010.

Source: http://www.environment.nsw.gov.au/rebates/index.htm; www.environment.nsw.gov.au/resources/rebates/10756LGARebateStats.pdf; www.environment.nsw.gov.au/resources/grants/08626_ccfannualreport.pdf, pp 9, 22; www.environment.nsw.gov.au/resources/grants/10143CCFAnnRep.pdf, pp 9, 10, 22; www.fridgebuyback.com.au; www.industry.nsw.gov.au/energy/sustainable/renewable/solar/solar-scheme; www.livinggreener.gov.au/rebates-assistance/new-south-wales/home-sustainability-assessment; www.savepower.nsw.gov.au/households/home-power-savings-program/frequently-asked-questions-(faq).aspx, all sites accessed October 2010.

Box 3.3 Commonwealth Government's water and energy saving measures

National rainwater and grey water initiative	Rebates of up to $500 for installing rainwater tanks or a grey water treatment system. Rebate started on 30 January 2009.
Hot water system rebate	Rebate for upgrading from an electric hot water system to a solar/heat pump hot water system. Rebate amount of up to $1,000 (July 2007 to February 2009), up to $1,600 (February 2009 to February 2010) and up to $1000 (since February 2010). $100,000 household income means test applied from July 2007 to February 2009. Since February 2009, rebate no longer means tested. The rebate is in addition to the renewable energy certificates (RECs) assigned to most solar and heat pump hot water systems sold in Australia. The Department of Climate Change and Energy Efficiency indicates that RECs can provide a discount of around $1,000 on the up front cost of the average solar or heat pump hot water system.
Ceiling insulation rebate	Rebate to cover the cost of installing ceiling insulation. Rebate amount of up to $1,600 (February 2009 to November 2009) and up to $1200 (November 2009 to February 2010). Rebate finished in February 2010.
Solar Homes and Communities Plan	Rebate for installing solar photovoltaic systems. Rebate of up to $4,000 (2000 to November 2007) and $8,000 (November 2007 to June 2009). $100,000 household income means test applied from May 2008 to June 2009. Program finished 9 June 2009.
Solar Credits	Households that install small-scale solar photovoltaic, wind and hydro electricity systems from 9 June 2009 eligible to receive extra RECs. This reduces the cost of installing these systems.
Green Loans Program / Green Start Program	Free water and energy efficiency audits for households to identify ways to save energy and water. Households could then apply for subsidised interest free Green Loans of up to $10,000. This component of the program finished in March2010. Program started in July 2009. $250,000 household income means test applied from July 2010.

Source: www.environment.gov.au/about/publications/annual-report/08-09/index.html#download, pp 17-19; www.climatechange.gov.au/government/programs-and-rebates/green-loans/about.aspx; www.livinggreener.gov.au/rebates-assistance/new-south-wales/home-sustainability-assessment; www.livinggreener.gov.au/rebates-assistance/new-south-wales/home-energy-assessment; www.climatechange.gov.au/what-you-need-to-know/renewable-energy/solar-homes.aspx; www.climatechange.gov.au/what-you-need-to-know/renewable-energy/solar-homes/history.aspx; www.environment.gov.au/minister/archive/env/2009/mr20090609.html; www.climatechange.gov.au/government/programs-and-rebates/solar-hot-water.aspx; www.treasurer.gov.au/displaydocs.aspx?doc=factsheets/2009/010.htm&pageid=011&min=wms&year=&doctype=3; http://www.economicstimulusplan.gov.au/faqs/pages/default.aspx#CeilingInsulation; http://www.energymatters.com.au/docs/Federal_solarhotwater-guidelines.pdf; http://www.budget.gov.au/2009-10/content/myefo/html/appendix_a_11.htm, all sites accessed October 2010.

Box 3.4 Sydney Water's water saving measures

Toilet replacement service	Subsidised service to replace a household's single flush toilet with a water efficient dual flush toilet. Sydney Water estimates households can save up to $370 on the price of the toilet and installation.
Waterfix	$22 plumbing service to install water saving devices around the home and fix minor leaks. Sydney Water estimates this plumbing service would usually cost around $180.
Do It Yourself Water Saving Kits	Free Do-It-Yourself (DIY) Water Saving Kit (eg, kitchen tap aerator, flow regulators for showers).
Washing machine rebate	$150 rebate for purchasing a water efficient washing machine. Started in 2006 and finished 31 July 2008.

Source: www.sydneywater.com.au/Water4Life/InYourHome/WashingMachines/; www.sydneywater.com.au/Water4Life/InYourHome/Toilets.cfm; www.sydneywater.com.au/Water4Life/InYourHome/ToiletReplacementQandAs.pdf; www.sydneywater.com.au/Water4Life/InYourHome/WaterFix/; www.sydneywater.com.au/Publications/FactSheets/WaterFixQuestionsAndAnswers.pdf; www.sydneywater.com.au/Publications/Factsheets/DIYTermsAndConditions.pdf, all sites accessed October 2010).

3.2.3 Increases in utility prices

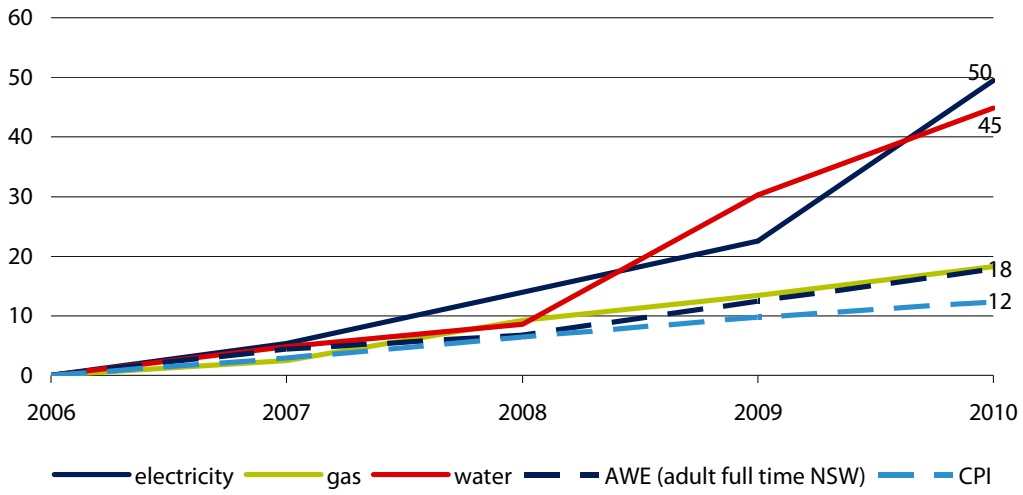
Residential energy and water prices increased fairly substantially between 2005/06 and 2009/10. In nominal terms:

- average electricity prices in NSW increased by 50%
- the water and sewerage bill increased by 45% (for 200kL of water per year)[26], and
- the gas bill for an AGL customer on a regulated tariff increased by 18% (for 20 GJ of gas per year).

The price increases for electricity and water (but not for gas) were significantly larger than the increase in both in the CPI (12%) and average earnings in NSW (18%, estimated using the change in average adult full time earnings in NSW) (Figure 3.7). These price increases may have encouraged households to use less energy and water. They might also have encouraged some households to turn to gas or solar power rather than electricity as a source of household energy.

26 The water and sewerage bill for a Sydney Water customer who does not quality for concessions.

Figure 3.7 Percentage increases in energy and water prices, CPI and average adult earnings, 2005/06 – 2009/10 (nominal %)



a The increase for electricity means the average increase in regulated electricity prices in NSW. The increase for water means the increase in the water and sewerage bill for a Sydney Water customer using 200kL or water per year. The increase for gas means the increase for an AGL customer using 20 GJ of gas per year and on a regulated tariff.

b AWE means average weekly earnings (adult full time, ordinary earnings for NSW).

Data sources: ABS, *Average Weekly Earnings, Australia,* ABS, *Consumer price index, Australia*, and IPART analysis of utility prices.

3.3 Changes in average residential electricity, gas and water consumption in Sydney

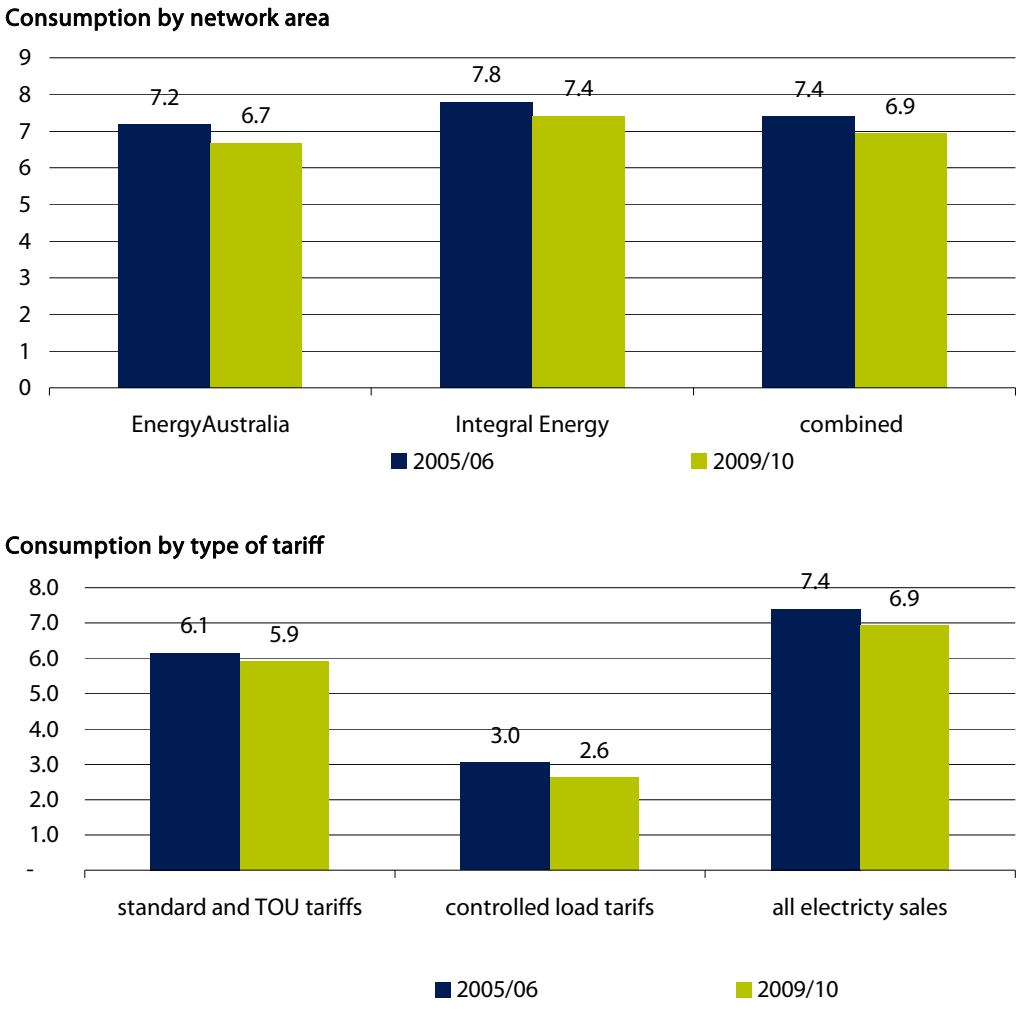
3.3.1 Changes in average residential electricity consumption, 2006 to 2010

Households have on average reduced their electricity consumption since 2005/06. Information from the network operators (EnergyAustralia and Integral Energy) indicates that average residential consumption in the combined network area has fallen from 7.4 MWh per year to 6.9 MWh per year (or 6%). Both network areas experienced decreases in average residential consumption (Figure 3.8).

Both networks experienced their biggest proportionate decrease in consumption on controlled load tariffs, which are mainly used for hot water systems (a 14% decrease in consumption per customer on a controlled load tariff, compared to a 4% decrease for consumption on other tariffs). Also, the number of residential customers on a controlled load tariff was 2% lower in 2009/10 than it had been in 2005/06. As a consequence, the total amount of electricity sold on controlled load tariffs fell by 15% over the period, compared to a 1% decline in the total amount sold on other tariffs. The use of electricity for hot water is discussed further in Chapter 4.

The electricity network areas cover a much larger geographical area than the Sydney Water area (ie, the survey area).[27] Also, the network data include some types of customers on residential tariffs that we do not include in our surveys (eg, churches and other institutions, caravan parks, holiday homes and customers with less than 12 months of billing data). This means that changes in average consumption in the network areas are only indicative of changes in consumption in the subset of customers that we included in our surveys.

Figure 3.8 Average residential electricity consumption in the EnergyAustralia and Integral Energy network areas, 2006 and 2010 (MWh pa)



a Average consumption of customers with a controlled load tariff.

Data source: Calculated by IPART using information provided by EnergyAustralia and Integral Energy.

27 nergyAustralia's network area includes the eastern parts of Sydney, Central Coast and Hunter regions. Integral Energy's area includes Sydney's Greater West, the Southern Highlands and the Illawarra.

3.3.2 Changes in average residential gas consumption, 2006 to 2010

Information from the gas network provider for NSW (Jemena) indicates that average residential consumption in NSW fell slightly from 21.3 GJ per year in 2005/06 to 20.2 GJ per year 2009/10 (a 5% reduction). Again, this is only very broadly indicative of changes in our survey area.

3.3.3 Changes in average residential water consumption, 2003 to 2010

The combination of water restrictions, water savings measures and rising prices has contributed to a fairly substantial decrease in water consumption in Sydney Water's area of operation since 2003. Largely in line with the imposition of water restrictions (see Box 3.1), information from Sydney Water shows that average residential consumption fell from 253 kL per year in 2002/03 to 183 kL in 2007/08 (the 3rd year of level 3 restrictions). Following the easing of water restrictions from June 2008, average consumption increased again to 199 kL per year in 2009/10, which is still well below the pre-water restrictions average (Figure 3.9).

Average consumption for households living in single dwellings[28] fell by more than for households living in units or flats[29] over the period 2002/03 to 2009/10 (25% compared with 8% for units or flats). Presumably, this largely reflects the restrictions imposed on outdoor water use (Figure 3.9).

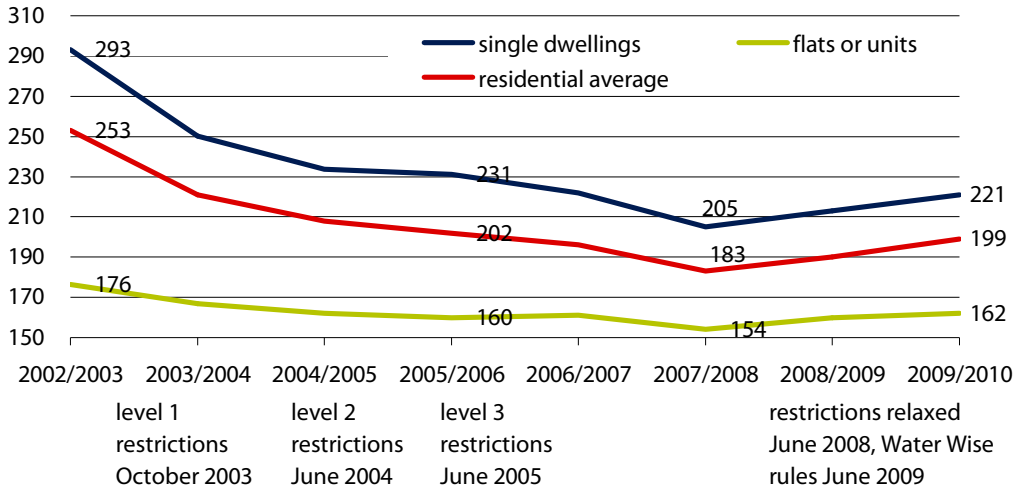
Looking at the period 2005/06 to 2009/10, average residential consumption for all dwelling types combined was almost the same in 2009/10 (199 kL per year) as it had been in 2005/06 (202 kL per year). However, households in single dwellings consumed slightly less in 2009/10 than they had in 2005/06 (10 kL per year, or 4% less), perhaps indicating permanent changes in behavior for example due to greater use of grey water and water from rain water tanks.[30] Households living in units or flats consumed about the same amount of water in 2009/10 as they had in 2005/06 (Figure 3.9).

[28] Sydney Water defines 'single dwellings' to include free-standing houses as well as semi-detached dwellings and terraces which are not strata or company titled.

[29] Sydney Water defines 'units or flats' to include flats as well as strata and company titled townhouses and duplexes.

[30] Our survey findings on the use of grey water and water from rain water tanks are discussed in Chapter 6.

Figure 3.9 Average residential water consumption for Sydney Water, 2002/03 to 2009/10 (kL pa)



Data source: Calculated by IPART using information provided by Sydney Water.

Like for electricity and gas, these changes in average consumption for all Sydney Water's residential customers are only indicative of changes in consumption in the subset of customers that we include in our surveys.[31]

Changes in electricity, gas and water consumption for the subset of customers that we include in our surveys are discussed in Chapters 4, 5 and 6 respectively.

[31] Sydney Water's residential customers include some that we exclude from our survey samples, for example holiday homes and households with fewer than 12 months of billing data.

4 Electricity consumption

As part of our 2010 household survey, we asked respondents about their household's characteristics – including its size, structure, income, dwelling type and ownership status. We analysed their responses to these questions to identify the household characteristics associated with consuming large and small amounts of electricity. We also asked participants questions about how many large electricity-using appliances their household has and how frequently they use those appliances, to identify which appliances and usage patterns tend to be associated with higher energy use. We paid particular attention to air conditioners because they can use large amounts of electricity and are important contributors to daily peak loads on the electricity network. In addition, we asked respondents about ceiling insulation, including if their household had it and, if so, when it had been installed.

Where possible, we compared the main findings from our 2010 survey to the findings from our surveys in Sydney in 2006 and in the Hunter, Gosford and Wyong areas in 2008. However, as previously noted, comparisons between survey findings should be treated with caution.

In summary, our analysis of the survey data on electricity consumption indicates that:

- On average, households in Sydney used less electricity in 2010 than they did in 2006.
- On average, households in the Blue Mountains use more electricity per year than households in either metropolitan Sydney[32], the Illawarra or the Hunter, Gosford and Wyong areas. Possible reasons for this include the colder climate and the very high proportion of households that live in free-standing houses in the Blue Mountains.
- The household characteristics that most influence average household consumption seem to be the number of occupants, the level of household income, whether or not the dwelling type is a free-standing house and whether or not gas is used as source of energy.

[32] The Sydney survey area excluding Blue Mountains and Illawarra.

- The electricity usage behaviours that most influence average household electricity consumption seem to be whether or not the household has and frequently uses large domestic appliances (such as air conditioners, dishwashers and clothes dryers), whether or not it has a swimming pool, and whether or not it has an electric hot water system.
- About 59% of households had an air conditioner. The factors that most influence whether or not a household has an air conditioner, and how often it uses it, are dwelling type and region (the latter due to climate).
- The proportion of respondents in Sydney who had an electric hot water system was slightly lower in 2010 (56%) than in 2006 (61%). This decline in the use of electric systems seems to have been accompanied by a slight increase in the use of solar hot water systems (from 3% to 6% of households).
- At least 47% of households had ceiling insulation for more than 12 months prior to the survey, and a further 18% had installed it in the 12 months prior to the survey.

The sections below discuss these findings in more detail.

4.1 Average electricity consumption

As Chapter 3 discussed, average residential consumption in the combined EnergyAustralia and Integral Energy network area was about 6% lower in 2009/10 than in 2005/06. Consistent with this trend, we found that average consumption of the households in our 2010 survey was 4% lower in than the average consumption of the households included in our 2006 survey (7.2 MWh per year compared to 7.5 MWh per year).[33,34]

However, caution is required when comparing the findings from our 2010 survey with those from the 2006 survey. As previously discussed, some of the observed differences in consumption might be due to differences in sampling methodology as well as the different methods used to weight the data (see Appendix A).

Looking at average electricity consumption in the individual areas within Sydney, both the 2010 and 2006 surveys found that households in the Blue Mountains use more electricity per year on average than households in either the Sydney metropolitan area or the Illawarra (Figure 4.1). Possible reasons for this include the colder climate and the very high proportion of households that live in free-standing

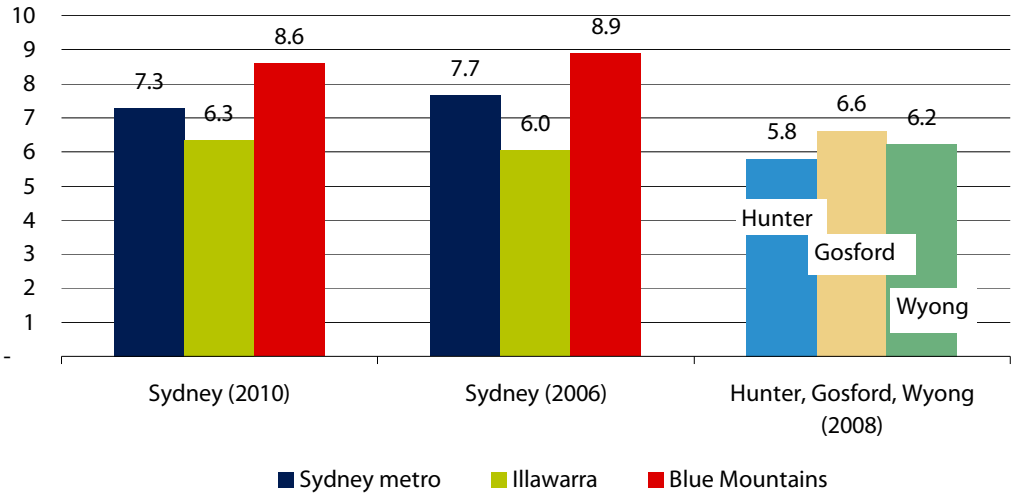
[33] The households included in our surveys represent only a subset of all customers on residential tariffs in the EnergyAustralia and Integral Energy network areas. These network areas are geographically wider than our survey area, and for example include the Central Coast. Also, customers on residential tariffs include churches and other institutions, as well as customers with less than 12 months of billing data. Therefore, changes in average consumption between surveys are unlikely to exactly reflect changes in average consumption on the networks.

[34] Average consumption from our surveys is calculated after weighting. The weights are discussed in Appendix A.

houses in the Blue Mountains. [35] The influence of dwelling type on average electricity consumption is discussed in section 4.2, and the influence of climate on space heating and cooling is discussed in section 4.4 below.

Households the Hunter, Gosford and Wyong areas consume similar average amounts to households in the Illawarra. This probably reflects the demographic similarities between these areas (see Chapter 3), and the fact that all 4 are coastal areas.

Figure 4.1 Average electricity consumption by area (MWh pa)



4.2 How do household characteristics affect electricity consumption?

Of the households we surveyed in Sydney in 2010:

- 27% are considered small electricity users (consuming up to 4 MWh per annum)
- 60% considered medium electricity users (with 21% consuming 4 to 6 MWh, 18% consuming 6 to 8 MWh and 21% consuming 8 to 12 MWh per annum)
- 13% are considered large electricity users (consuming more than 12 MWh per annum) (Figure 4.2).[36]

[35] In 2010, 98% of surveyed households in the Blue Mountains lived in free-standing houses, compared to 58% of surveyed households in the Sydney metropolitan area and 80% in the Illawarra. In the Hunter, Gosford and Wyong areas, almost 90% of surveyed households lived in free-standing houses.

[36] 1 MWh = 1,000 kWh.

Figure 4.2 Distribution of households by annual electricity consumption, Sydney (2010)

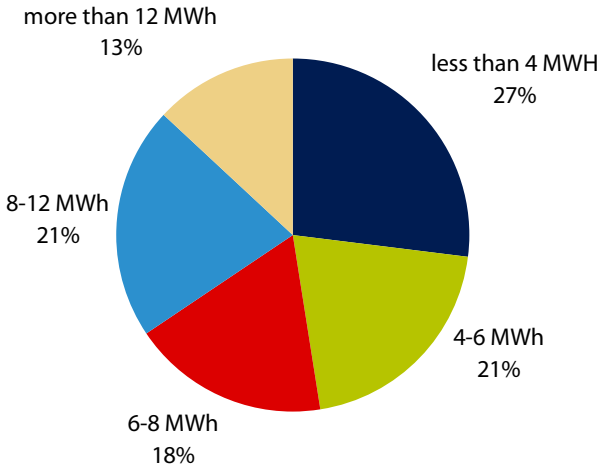


Table 4.1 below provides a snapshot of the household characteristics of small and large electricity users in Sydney in 2010. Where applicable, the table also shows the characteristics of small and large electricity users in the Hunter, Gosford and Wyong areas in 2008 for comparison (in brackets and *italics*).

The table suggests that, on average, large electricity users in Sydney had more occupants (3.8 compared to 1.7), and were more likely to consist of couples with children rather than single people living alone or couples without children. Large electricity users were also more likely to live in free-standing houses and have higher incomes. Small electricity users were more likely to live in flats, to have lower incomes and fewer occupants, to be retirees or pensioners and to use gas. A higher proportion of EnergyAustralia's network customers (east) were small users than Integral Energy's customers (west). Large users were more likely than small users to have had ceiling insulation for at least a year prior to the survey.

Table 4.1 Snapshot: Household characteristics of small and large electricity users, Sydney (2010) and Hunter, Gosford, Wyong (2008)[a]

Small electricity users (less than 4 MWh per annum)		Large electricity users (more than 12 MWh per annum)	
1.7 people per household	*(1.7)*	*3.8 people per household*	*(4.0)*
72% are 1 person households or couples with no children living at home;	*(79%)*	17% are 1 person households or couples with no children living at home;	*(14%)*
15% are couples with children	*(10%)*	70% are couples with children	*(79%)*
42% of respondents are aged over 65	*(60%)*	16% of respondents are aged over 65	*(14%)*
45% have a pensioner concession card	*(70%)*	12% have a pensioner concession card	*(17%)*
39% are low-income households [b]	*(66%)*	6% are low-income households [b]	*(6%)*
6% are high-income households [c]	*(3%)*	31% are high-income households [c]	*(30%)*
31% live in a free-standing house	*(78%)*	96% live in a free-standing house	*(97%)*
17% live in a semi- detached dwelling	*(18%)*	3% live in a semi- detached dwelling	*(2%)*
53% live in a flat	*(4%)*	2% live in a flat	*(1%)*
70% live in EnergyAustralia's network area (east)		56% live in EnergyAustralia's network area (east)	
30% live in Integral Energy's area (west)		44% live in Integral Energy's area (west)	
63% use gas (mains or cylinder [d])	*(37%)*	49% use gas (mains or cylinder [d])	*(40%)*
26% had ceiling insulation for more than 1 year		70% had ceiling insulation for more than 1 year	

a Values for Hunter, Gosford, Wyong (2008) are in brackets and *italics.*

b Households with incomes below $33,800 per annum in Sydney (2010) and below $31,2000 per annum in Hunter, Gosford, Wyong (2008).

c Households with incomes above $130,000 per annum in Sydney (2010) and above $104,000 in Hunter, Gosford, Wyong (2008).

d Cylinder gas refers to large, non-portable gas cylinders set up outside the dwelling.

These findings are generally consistent with the findings of our 2008 survey of the Hunter, Gosford and Wyong areas (shown in Table 4.1), and our 2006 survey of Sydney.[37]

However, there are notable differences in the household characteristics and energy consumption patterns between Sydney and the Hunter, Gosford and Wyong areas. These stem largely from differences in their demographic profiles, as well as the fact that Sydney has proportionately more flats and semi-detached dwellings than the

37 See IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra - Results from the 2006 household survey*. Electricity, Gas and Water – Research Paper 29, 2007 (Chapter 2).

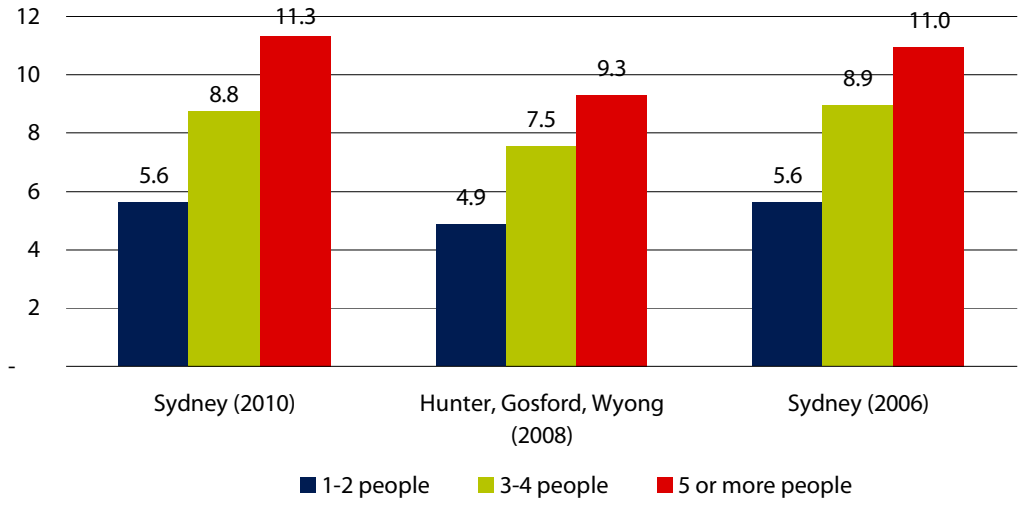
other areas.[38] Another difference between the survey areas is access to mains gas and the use of cylinder gas, which is further discussed in Chapter 5.

The sections below discuss the relationship between electricity consumption and the number of occupants, dwelling type, and the use of mains gas in more detail. The relationship between consumption and ceiling insulation is discussed in section 4.6.

4.2.1 Relationship between the number of occupants and electricity consumption

On average, households with more occupants use more electricity. For example, in Sydney (2010), we found that households with 5 or more people used roughly double the amount households with only 1 or 2 people used. We found a similar relationship in our 2008 and 2006 surveys (Figure 4.3).

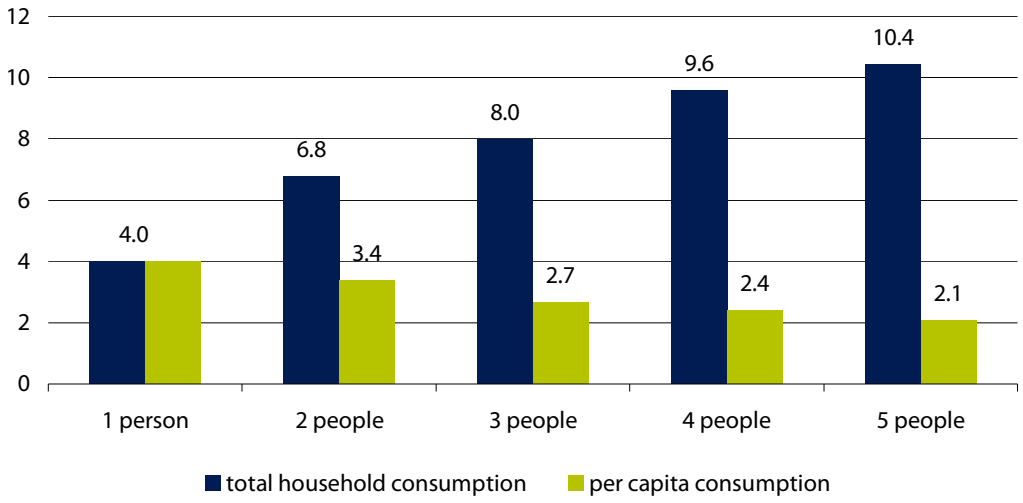
Figure 4.3 Average electricity consumption by household size (MWh pa)



While households with more occupants use more electricity overall, on average they use less electricity per person than households with fewer occupants. For example, in Sydney (2010) households with 5 occupants on average used 2.1 MWh per year each, which is roughly half the amount used by 1 person households (Figure 4.4).

[38] These factors may explain, for example, why a significantly lower proportion of small users in Sydney have low incomes (39% compared to 66% in the Hunter, Gosford and Wyong areas).The likely explanation for this is twofold: Firstly, a higher proportion of small users in Sydney live in semi-detached dwellings and flats (and therefore use less energy) but do not necessarily have low incomes. Secondly, Sydney simply has proportionately fewer low-income households in total (25% in Sydney in 2010 compared to 35% in the Hunter, Gosford and Wyong areas in 2008).

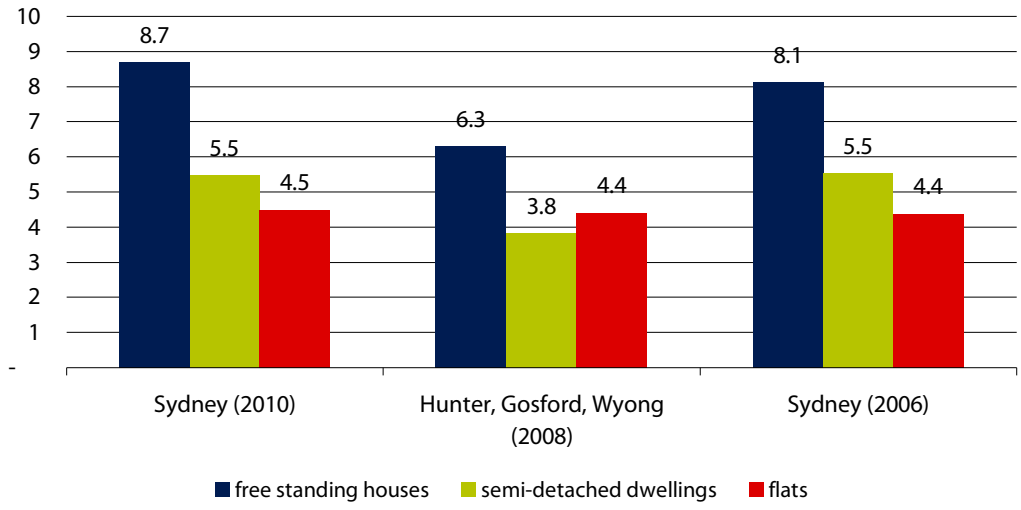
Figure 4.4 Average household and per capita electricity consumption by household size, Sydney (2010) (MWh pa)



4.2.2 Relationship between electricity consumption and dwelling type

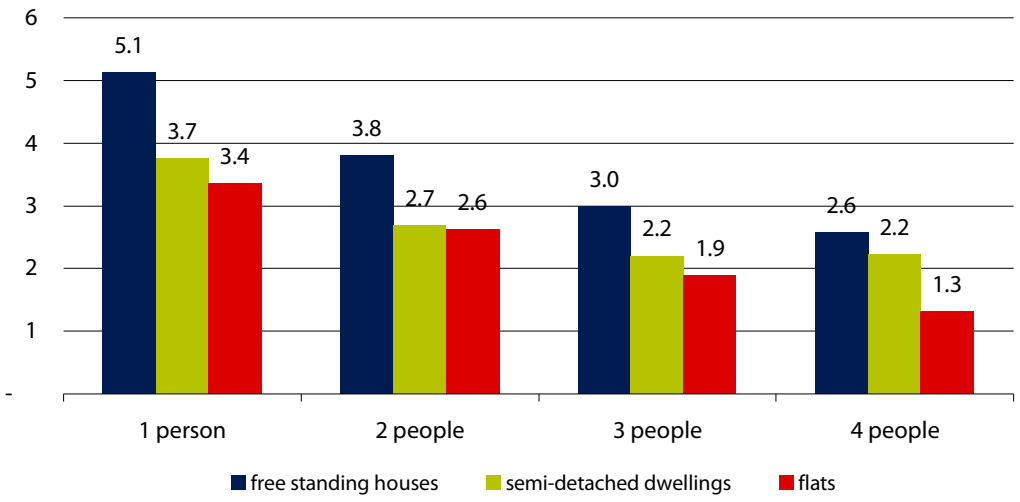
Households living in freestanding houses tend to consume more electricity than those living in flats or semi-detached dwellings, such as terrace houses, villa units or town houses. For example, in Sydney in 2010, households in freestanding houses consumed on average 3.2 MWh (or 59%) more electricity than those living in semi-detached dwellings. Households in free-standing houses consumed on average 4.2 MWh (or 93%) more than households in flats. Again, these findings are consistent with the findings of our 2008 and 2006 surveys (Figure 4.5).

Figure 4.5 Average electricity consumption by dwelling type (MWh pa)



Besides consuming more electricity, households living in freestanding houses also tend to have more occupants than households in other dwelling types. For example in Sydney in 2010, on average free-standing houses had 3 occupants, semi-detached dwellings had 2.2 occupants and flats had 1.9 occupants. To investigate whether the higher consumption of households in free-standing houses was simply due to the higher number of occupants, we compared the average consumption per person in households living in houses and other dwelling types (where the number of occupants was the same). The results indicate that households living in free-standing houses consistently consumed more electricity per person than those living in semi-detached dwellings and flats (Figure 4.6). We found a similar association between electricity consumption per person and dwelling type in our 2008 and 2006 surveys.

Figure 4.6 Average electricity consumption per person by dwelling type and household size, Sydney (2010) (MWh pa)



4.2.3 Relationship between electricity consumption and the use of mains gas

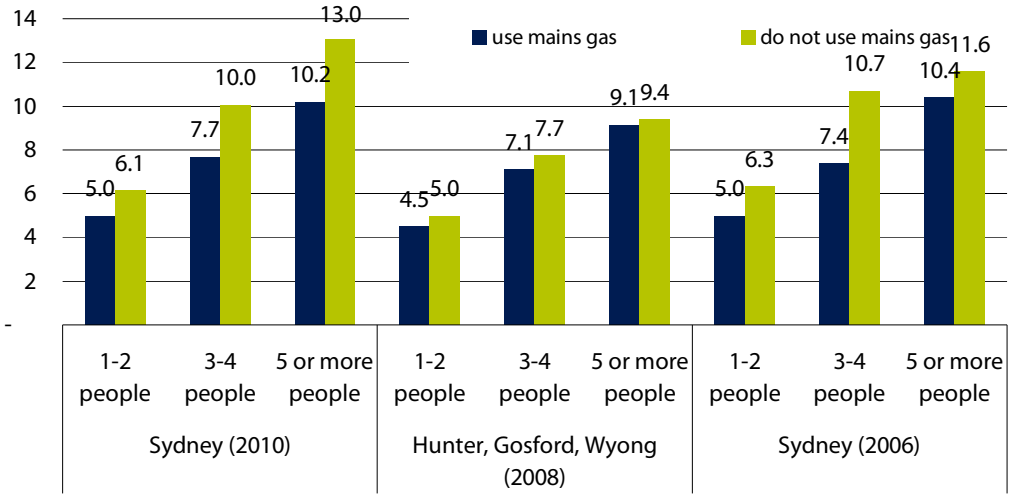
Households that use mains gas generally use less electricity than households without mains gas. The 2010 survey found that on average, households in Sydney that use mains gas consumed 1.3MWh (or 16%) less electricity than households without mains gas.

Comparing electricity consumption for households with the same number of occupants, we found that households with 1 or 2 occupants using mains gas consumed 1.2 MWh (or 19%) less electricity than similar households without mains gas. Households with 5 or more occupants using mains gas consumed 2.8 MWh (or 22%) less electricity than those without mains gas.

We found a similar relationship between the use of mains gas and lower electricity consumption in our 2006 survey of Sydney. However, the relationship appears to be

much weaker in the Hunter, Gosford and Wyong areas. For example, our 2008 survey found that households with 1 or 2 occupants using mains gas consumed just 9% less electricity than those without mains gas (Figure 4.7). The reason for the difference between the 2 survey regions is unclear, but it may be due to the more limited availability of mains gas in the Hunter, Gosford and Wyong areas and the smaller sample size. Gas usage is discussed in Chapter 5 below.

Figure 4.7 Average electricity consumption with and without mains gas, by number of occupants (MWh pa)



4.3 What do households use electricity for?

To better understand what electricity is used for, the 2010 household survey asked respondents about:

- how many large appliances and amenities they have (eg, dishwashers, clothes dryers, air conditioners and swimming pools)
- how frequently they use each of these appliances
- their main source of energy for hot water
- whether they use electricity for cooking.

Table 4.2 below provides a snapshot of the usage patterns of small and large electricity users for Sydney in 2010. For comparison, the table also shows the usage patterns of small and large electricity users in the Hunter, Gosford and Wyong areas in 2008 (in brackets and *italics*). We found that large electricity users in Sydney on average had more appliances, and used them more often. They were particularly more likely to have air conditioning, a 2nd refrigerator and a swimming pool (with a pump). They were also more likely to have an electric hot water system, to use only electricity for cooking and to use electricity as the main source of energy for space heating (including with reverse cycle air conditioners).

These findings are broadly consistent with our 2008 survey in the Hunter, Gosford and Wyong areas. The main difference between the survey regions stems from the fact that mains gas is more widely available in Sydney.

The findings of our 2010 survey are also consistent with those for the 2006 survey in Sydney.[39]

[39] IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra - Results from the 2006 household survey*. Electricity, Gas and Water – Research Paper 29, 2007.

Table 4.2 Snapshot: Usage characteristics of small and large electricity users, Sydney (2010) and Hunter, Gosford, Wyong (2008)

Small electricity users (less than 4 MWh per annum)		Large electricity users (more than 12 MWh per annum)	
3.2 large domestic appliances, on average	*(3.6)*	5.8 large domestic appliances, on average	*(6.0)*
83% use a dishwasher less than once a week or do not have one	*(88%)*	24% use a dishwasher less than once a week or do not have one	*(23%)*
3% use one 6 times a week or more	*(3%)*	41% use one 6 times a week or more	*(47%)*
84 % use a clothes dryer less than once a week or do not have one	*(89%)*	53% use a clothes dryer less than once a week or do not have one	*(47%)*
5% use one 3 time a week or more	*(3%)*	16% use one 3 times a week or more	*(38%)*
62 % use a washing machine less than 3 times a week or do not have one	*(62%)*	15% use a washing machine less than 3 times a week or do not have one	*(20%)*
5% use one 6 times a week or more	*(7%)*	36% use one 6 times a week or more	*(33%)*
54% use a microwave oven 6 times a week or more	*(63%)*	75% use a microwave oven 6 times a week or more	*(82%)*
36 % have an air conditioner, and	*(60%)*	83 % have an air conditioner, and	*(88%)*
34% of those use it 3 days a week or more in summer	*(26%)*	59% of those use it 3 days a week or more in summer	*(52%)*
15% mainly use reverse cycle air conditioning to heat their homes in winter	*(32%)*	51% mainly use reverse cycle air conditioning to heat their homes in winter	*(53%)*
22% have a second refrigerator	(31%)	80% have a second refrigerator	(84%)
3% have a swimming pool (pump)	(1%)	47% have a swimming pool (pump)	(51%)
45 % have an electric hot water system (main source)	*(74%)*	70 % have an electric hot water system (main source)	*(74%)*
47% use only electricity for cooking	*(78%)*	64% use only electricity for cooking	*(85%)*
47% mainly use electricity for heating	*(61%)*	63% mainly use electricity for heating	*(62%)*

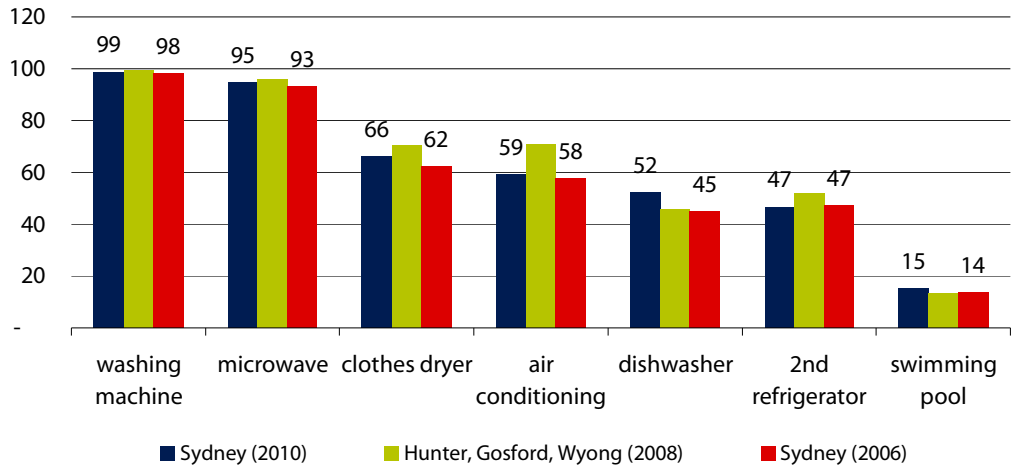
We discuss the relationship between consumption and owning and using appliances in more detail below. Air conditioners are discussed in more detail in section 4.4, and hot water systems are discussed in section 4.5.

4.3.1 Relationship between appliance ownership and electricity consumption

The 2010, 2008 and 2006 surveys asked respondents which of the following large appliances they have: dishwasher, washing machine, clothes dryer, air conditioner, swimming pool, microwave oven and 2nd refrigerator. Almost all respondents in Sydney in 2010 had a washing machine and a microwave oven. Two-thirds had a

clothes dryer, and more than half had an air conditioner and a dishwasher. Just less than half had a 2nd refrigerator, but only 15% had a swimming pool. The results of the 2008 and 2006 surveys were similar (Figure 4.8).

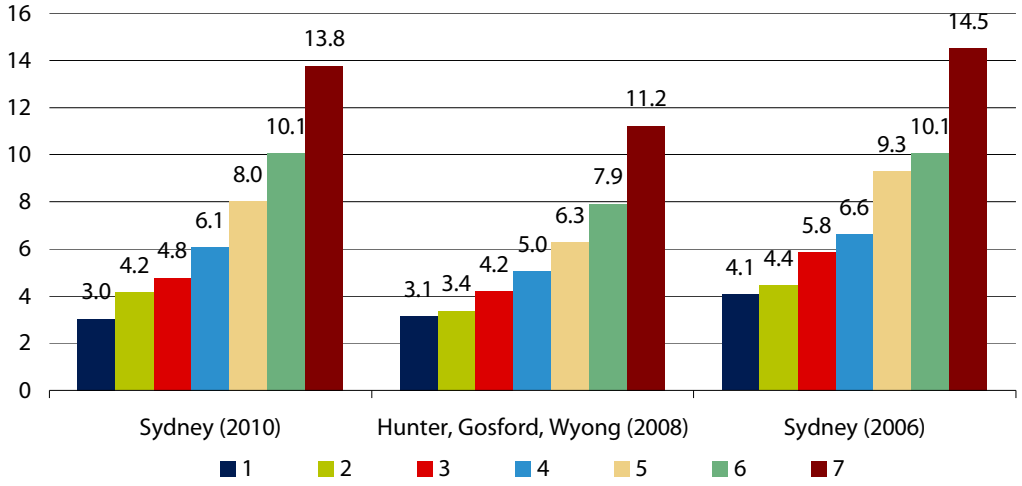
Figure 4.8 Proportion of households with selected appliances (%)



Not surprisingly, we also found that the more of these appliances a household has, the higher its electricity consumption. For example, households with 5 of the appliances the survey asked about on average consumed 3.9 MWh per year (93%) more than those with 2 appliances, and households with 7 of these appliances used about 9.6 MWh per year (232%) more than those with 2 (Figure 4.9).

However, it is important to note that these differences in consumption should not be interpreted as the incremental effect of owning (or using) an additional appliance on annual energy consumption. Other household characteristics may contribute to both owning (and frequently using) an appliance and consuming more electricity – for example, household income, dwelling type and number of occupants.

Figure 4.9 Average electricity consumption by number of large appliances (MWh pa)



To better understand the relationship between appliance ownership, electricity consumption and household characteristics, we looked at the relationship between the number of large appliances a household has and its income and number of occupants. On average, high-income households tend to have more of these appliances. For example, our 2010 survey found such households had an average of 5.0 of these appliances, while low-income households had 3.7 (Figure 4.10).

One the other hand, having more occupants does not necessarily mean having more appliances (Figure 4.11). This suggests that, *ceteris paribus*, a high-income household is likely to use more electricity than a low-income household with the same number of occupants, because the high-income household has more appliances. (The relationship between income and consumption is further discussed in Chapter 7).

Our 2008 findings were very similar for the Hunter, Gosford and Wyong areas.

Figure 4.10 Average number of large appliances by income

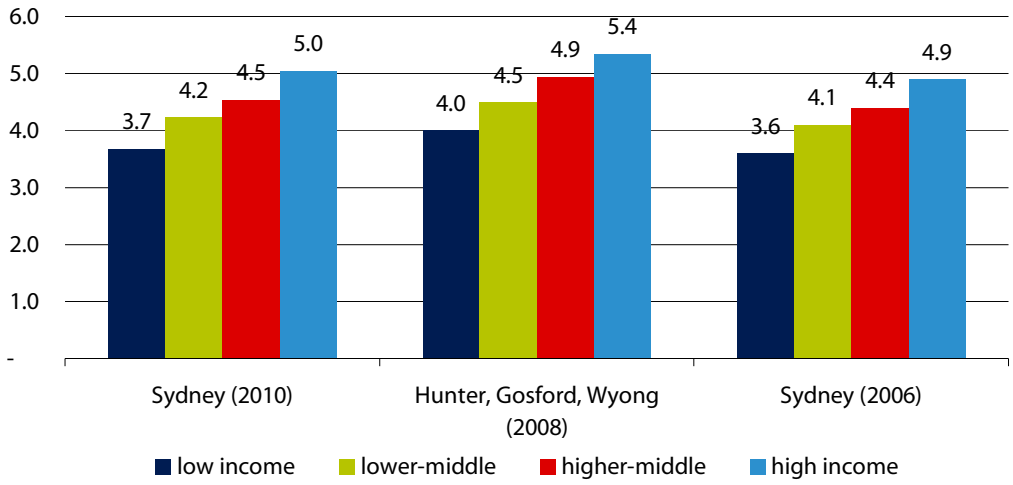
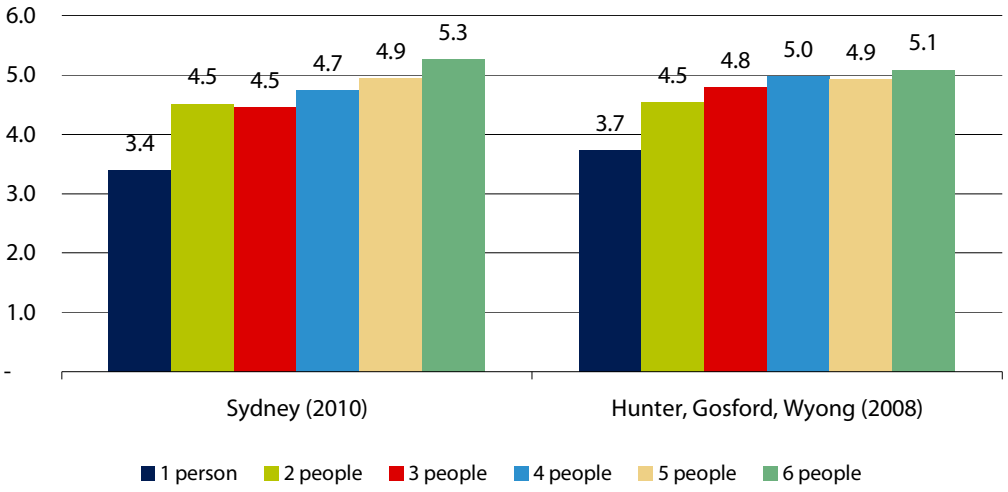


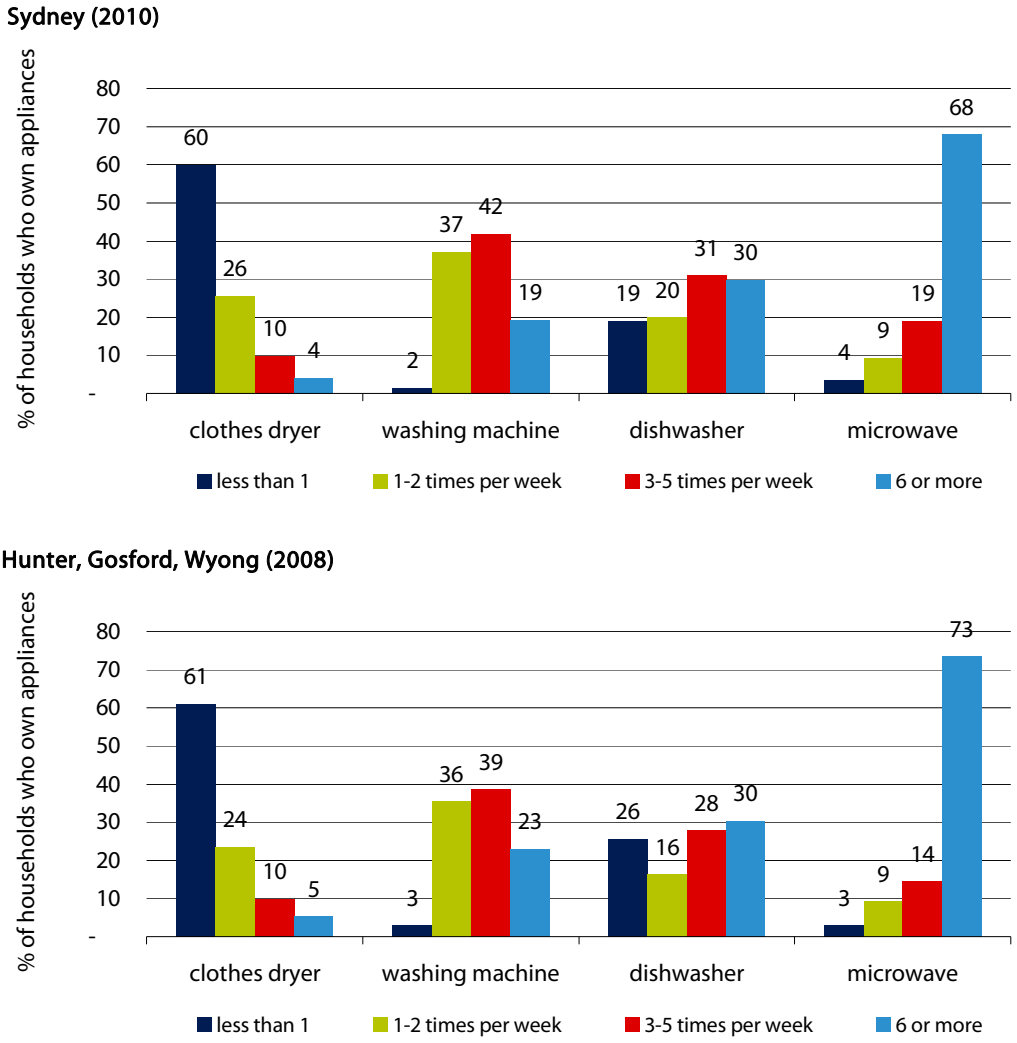
Figure 4.11 Average number of large appliances by household size



4.3.2 Relationship between appliance usage and electricity consumption

Since some households have appliances but seldom use them, the survey also asked respondents about how frequently they use the various appliances. As Figure 4.12 shows, in Sydney in 2010 microwaves were the most frequently used (87% of households that had them used them at least 3 times a week), followed by washing machines and dishwashers (61% of those that had them used them at least 3 times a week). Clothes dryers were used least often. We found similar usage patterns in the Hunter, Gosford and Wyong areas in 2008.

Figure 4.12 How often households used selected appliances per week (% of households that own the appliance)



Not surprisingly, the more frequently households use their appliances the higher their electricity consumption. For example, Figure 4.13 shows that of the households that had them (in Sydney 2010):

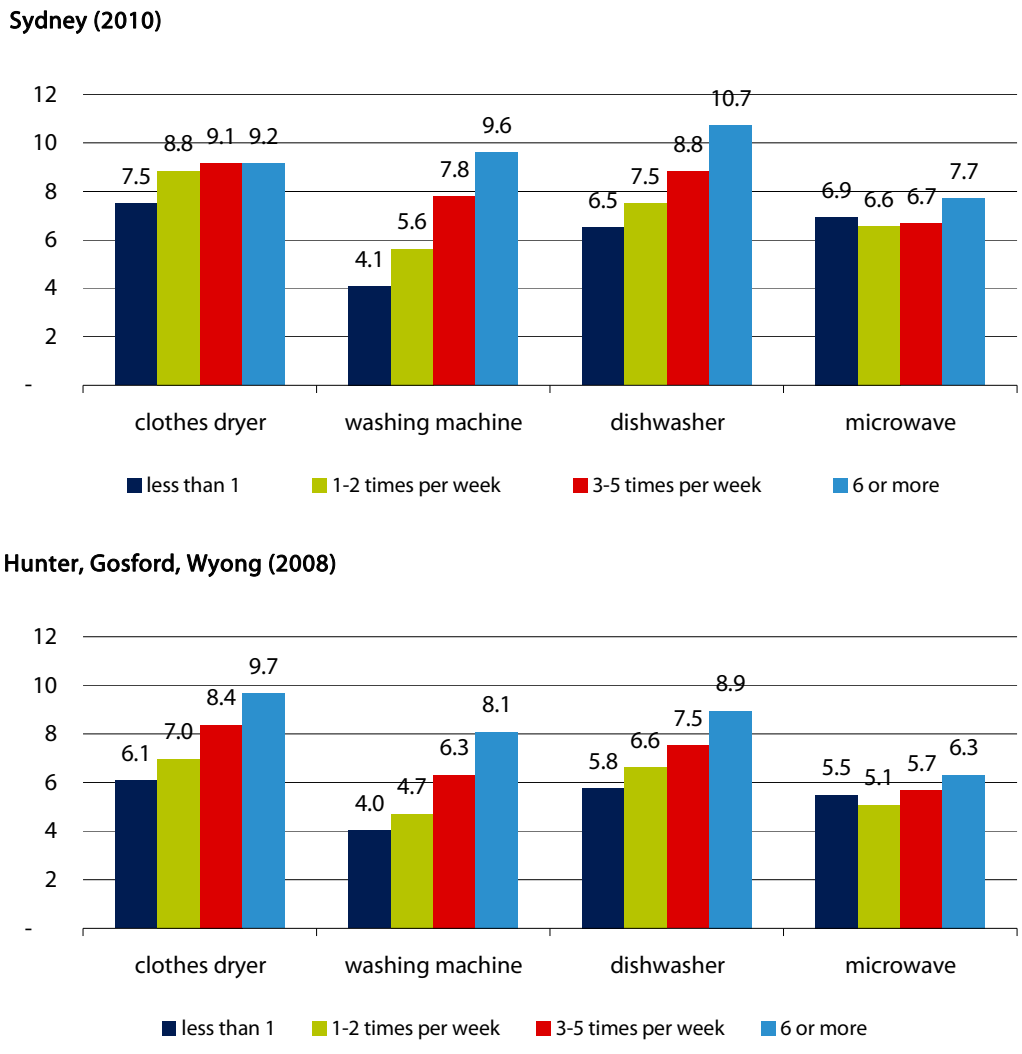
- those that used their washing machines 6 or more times a week consumed an average of 4.0 MWh (or 71%) more electricity than those that used them 1 to 2 times a week
- those that used their dishwashers 6 or more times a week used an average 4.2 MWh (or 65%) more electricity than those that used them less than once a week

For microwave ovens, our 2008 and 2010 surveys found that the association between more frequent use and increased electricity consumption was less clear. This might be because smaller households (who generally use less electricity) tend to use

microwave ovens for cooking more often than stoves and ovens, compared to larger households. Also, microwaves tend to be used for shorter periods of time and use less energy than other large appliances (Figure 4.13).

For clothes dryers, the 2010 survey also found that the association between more frequent use and increased electricity consumption was unclear. Households that used their clothes dryer at least 6 times a week consumed an average of 1.7 MWh (or 22%) more electricity than those that used them less than once a week. But there was little difference between households that used their dryers 1 or 2 times a week and 6 or more times a week. In contrast, the 2008 survey in the Hunter, Gosford and Wyong areas found a fairly clear association between how often a household used a clothes driver and its average consumption (Figure 4.13). The reasons for the finding in Sydney and the differences between the areas are unclear.

Figure 4.13 Average household electricity consumption by frequency of appliance use (MWh pa)



4.4 Relationship between air conditioner usage and electricity consumption

Because air conditioners are widely understood to use large amounts of electricity and to be important contributors to daily peak loads on the electricity network, we asked respondents about whether their home has air conditioning. For respondents that indicated they have air conditioning, we also asked how often they use it in summer and winter (including the number of hours per day). (Unfortunately, given the nature of the survey, we were unable to look at households' daily air conditioning usage patterns in terms of the time of day.)[40]

4.4.1 Relationship between dwelling type and having an air conditioner

The 2010 survey found that an average of 59% households across Sydney had an air conditioner in their home. This is smaller than the proportion of households that had air conditioners in the Hunter, Gosford and Wyong areas in 2008 (Figure 4.14).[41]

Our 2010, 2008 and 2006 surveys all found that households in free-standing houses were more likely to have an air conditioner than households in semi-detached dwellings, and that households in flats were the least likely to have an air conditioner. For example, our Sydney (2010) survey found that 69% of households living in free-standing houses had an air conditioner, compared to 58% of households living in semi-detached dwellings and 35% of households living in flats (Figure 4.14).

One of the reasons why a significantly higher proportion of households in the Hunter, Gosford and Wyong areas had an air conditioner is simply because most of the surveyed household in these area areas lived in free-standing houses (88%, compared to 62% in Sydney) and very few lived in flats (3%, compared to 25% in Sydney). Comparing households in the 2 survey areas who live in the same type of dwelling, our results show that households in the Hunter, Gosford and Wyong areas were only slightly more likely to have air conditioners than households in Sydney in 2010 (Figure 4.14).

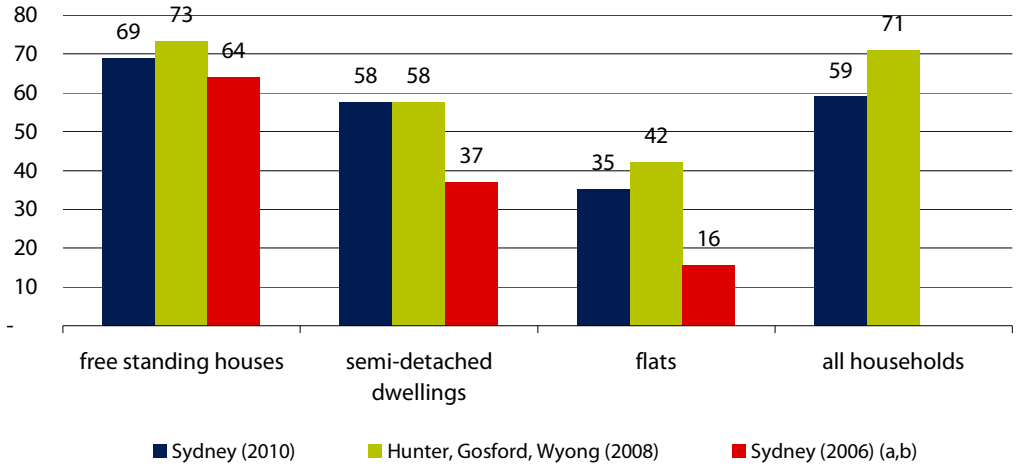
Our findings for Sydney in 2006 and 2010 suggest that there was an increase in the proportion of households with an air conditioner. In particular, the proportion of households in free-standing houses that had an air conditioner was 5% higher in 2010 than in 2006. The findings also suggest that households in both semi-detached dwellings and flats were more likely to have an air conditioner in 2010 than in 2006 (Figure 4.14). However, comparisons between the 2010 and 2006 survey findings for

[40] The 2006 survey in Sydney did not ask respondents about how often they used their air conditioners.

[41] The 2006 survey found that 58% of all households in Sydney had an air conditioner. However, free-standing houses were over-represented in the 2006 survey (82% of households, compared to 62% in the 2010 survey after weighting), and flats in particular were under-represented (7% of households, compared to 25% in the 2010 survey after weighting). Therefore, the results for the 2006 survey cannot be compared to those for the 2010 survey and have not been show.

flats and semi-detached dwellings should be treated with caution due to the differences in survey methodology.[42, 43]

Figure 4.14 Proportions of households that have air conditioning by dwelling type (%)



a The Sydney (2006) results for semi-detached dwelling and flats should be treated with caution. The 2006 survey adopted a door-to-door methodology, which meant that is was very difficult to access dwelling complexes that had security systems (see Chapter 2).

b The Sydney (2006) average for all households is not shown because free-standing houses were over-represented in the survey sample while flats were under-represented. Therefore, the 2006 average for all households cannot be meaningfully compared to the 2010 average for all households.

4.4.2 Relationship between income and having an air conditioner

The 2010, 2008 and 2006 surveys all found that low-income households were somewhat less likely to have air conditioners than those with higher incomes. Nevertheless, more than half of low-income households in both Sydney and the Hunter, Gosford and Wyong areas had an air conditioner (Figure 4.15).

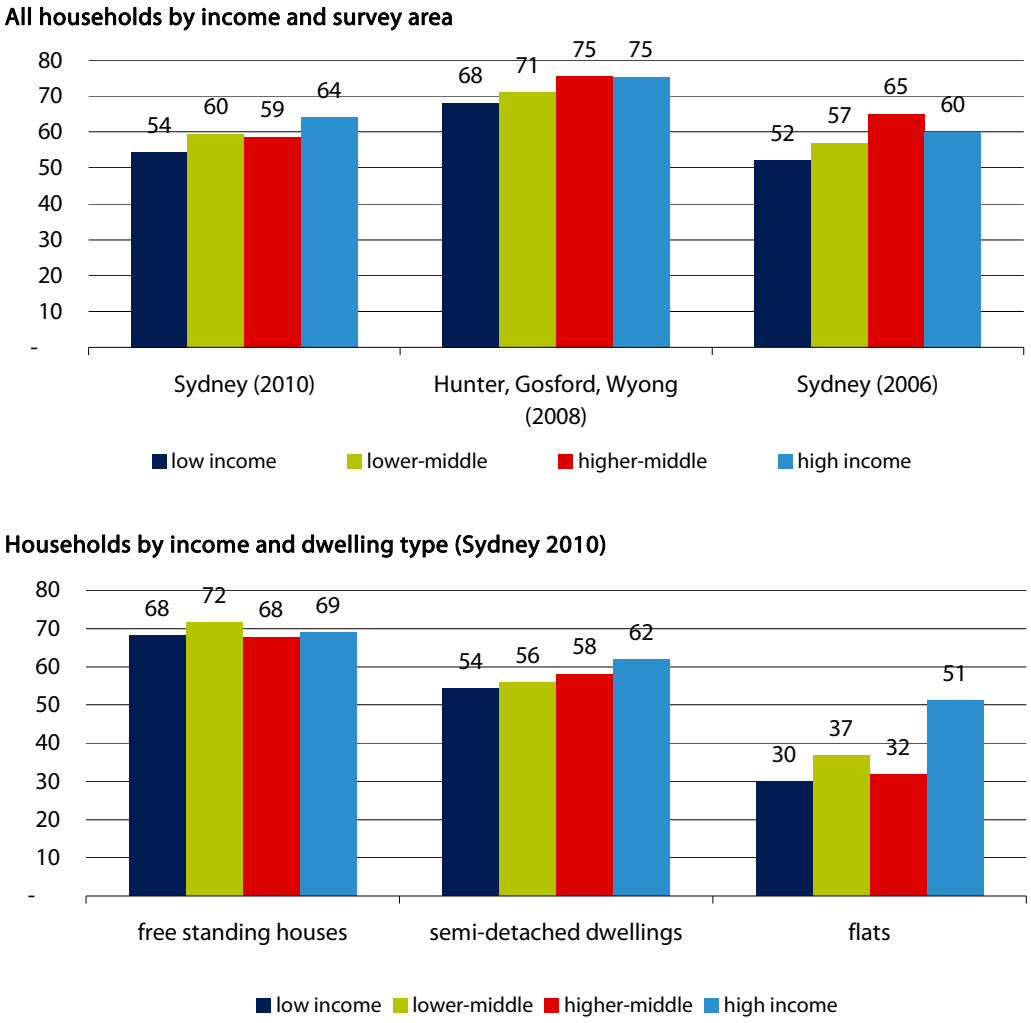
Looking more closely at the relationship between income, dwelling type and air conditioning, our analysis suggests that dwelling type has a bigger impact than income level on the likelihood of having an air conditioner. In particular, we found that roughly 70% of Sydney (2010) households in all income groups that live in free-standing houses had an air conditioner. For households that live in semi-detached dwellings, low-income households were somewhat less likely to have air

42 The 2006 survey adopted a door-to-door methodology, which meant that is was very difficult to gain access to dwelling complexes that had security systems. The 2010 survey adopted a telephone-based methodology, and therefore did not have this problem. (See Chapter 2). It is possible that dwelling complexes with security systems are more likely to have air conditioning than dwelling complexes without security systems.

43 The 2006 average for all households cannot be meaningfully compared to the 2010 average for all households because free-standing houses were over-represented in the 2006 survey sample while flats were under-represented.

conditioners than their high-income counterparts (54% compared to 62%). Only for households that live in flats was there a marked difference between income groups, with 51% of high-income households having an air conditioner compared to 30% of low-income households (Figure 4.15).

Figure 4.15 Proportions of households that have air conditioning by income (%)

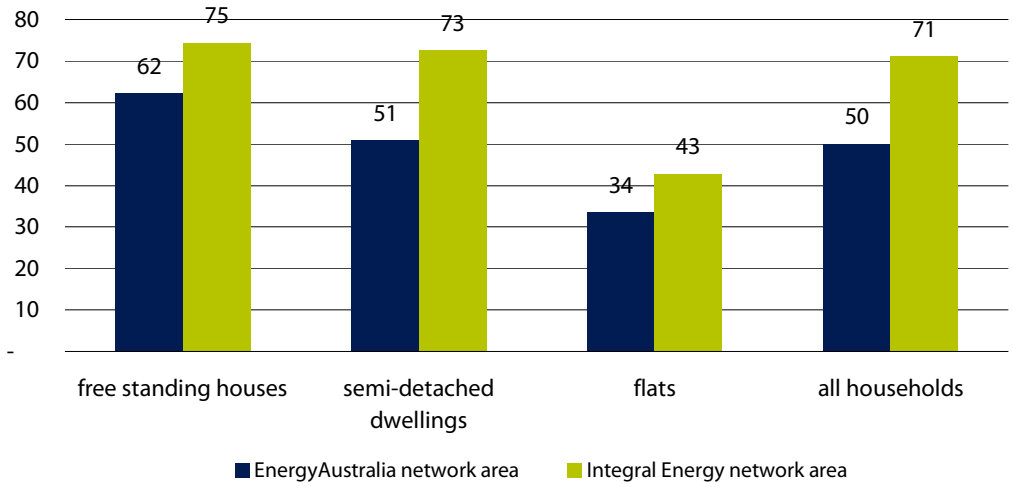


4.4.3 Relationship between geographical area and having an air conditioner

Geographic area – or more probably climate differences between geographic areas – seems to play a role in whether or not households have an air condition. For example, a significantly higher proportion of households have air conditioners in Integral Energy's network area (western Sydney) than in EnergyAustralia's area (eastern Sydney) (Figure 4.16).

However, part of reason for this difference is simply that a much higher proportion of dwellings in Integral Energy's area are free-standing houses (81% compared to 49% in EnergyAustralia's area) and a lower proportion are flats (10% compared to 36% in EnergyAustralia's area).[44] And as noted above, households that live in free-standing houses are more likely to have air conditioner than households that live in flats.

Figure 4.16 Proportion of households with air conditioners by dwelling type and network area, Sydney (2010) (%)

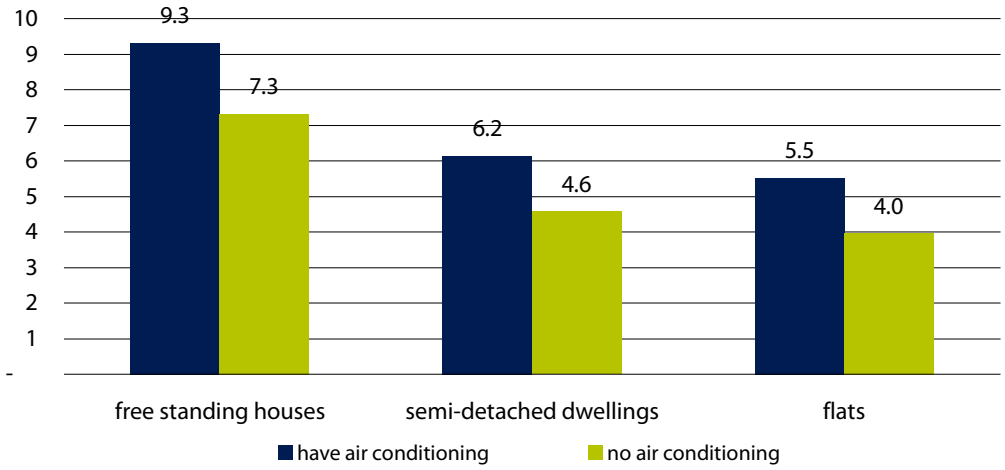


4.4.4 Relationship between having an air conditioner and electricity consumption

Households that have air conditioning on average use more electricity than households without air conditioning. For example, looking at households that live in free-standing houses, our 2010 Sydney survey found those with air conditioners used on average 2.0 MWh per year (27%) more than households without air conditioners. Of households in semi-detached dwellings and flats, those with air conditioners used on average about 1.6 MWh per year (34% and 39% respectively) more than those without (Figure 4.17).

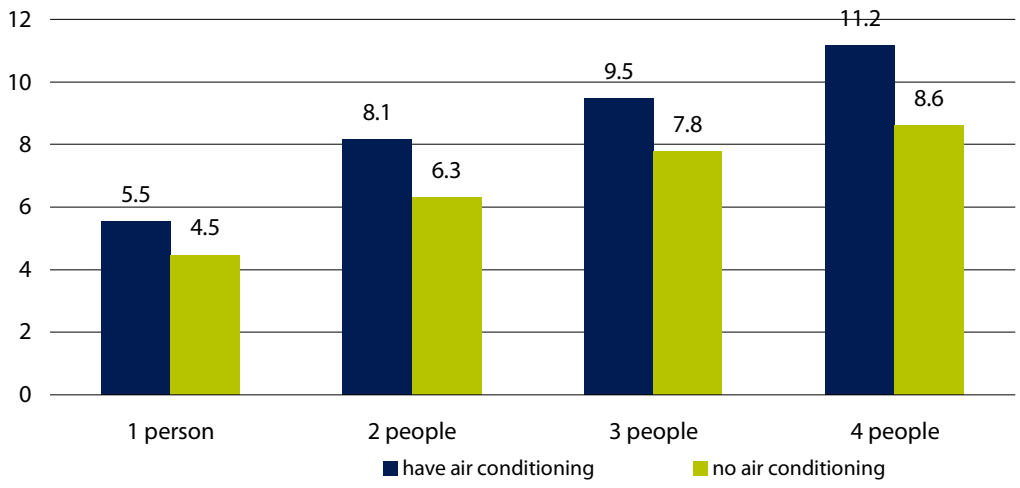
[44] One of the functions of the 2010 weights was to ensure that the proportion of free-standing houses, semi-detached dwelling and flats in our survey sample reflected the actual distribution of these dwelling types according 2006 Census data. The weights are discussed in more detail in Appendix A.

Figure 4.17 Average electricity consumption for households with and without an air conditioner by dwelling type, Sydney (2010) (MWh pa)



To separate the impact on consumption of having an air conditioner from the impacts of dwelling type and having more occupants, we compared the consumption for households with the same number of occupants and living in free-standing houses. We found that households with the same number occupants use significantly more electricity if they have an air conditioner. For example, 2 person households with air conditioners on average used 1.8 MWh (29%) more electricity per year than 2 person households without air conditioners, and 4 person households with air conditioners used 2.5 MWh (29%) more than 4 person households without air conditioners (Figure 4.18).

Figure 4.18 Average electricity consumption for households in free-standing houses with and without air conditioners by number of occupants, Sydney (2010) (MWh pa)



These differences in consumption should not be read as the incremental effects of having an air conditioner. Other characteristics of households with and without air conditioners may account for some of the differences. For example, we found that a higher proportion of households in free-standing houses that had air conditioners also had swimming pools.[45]

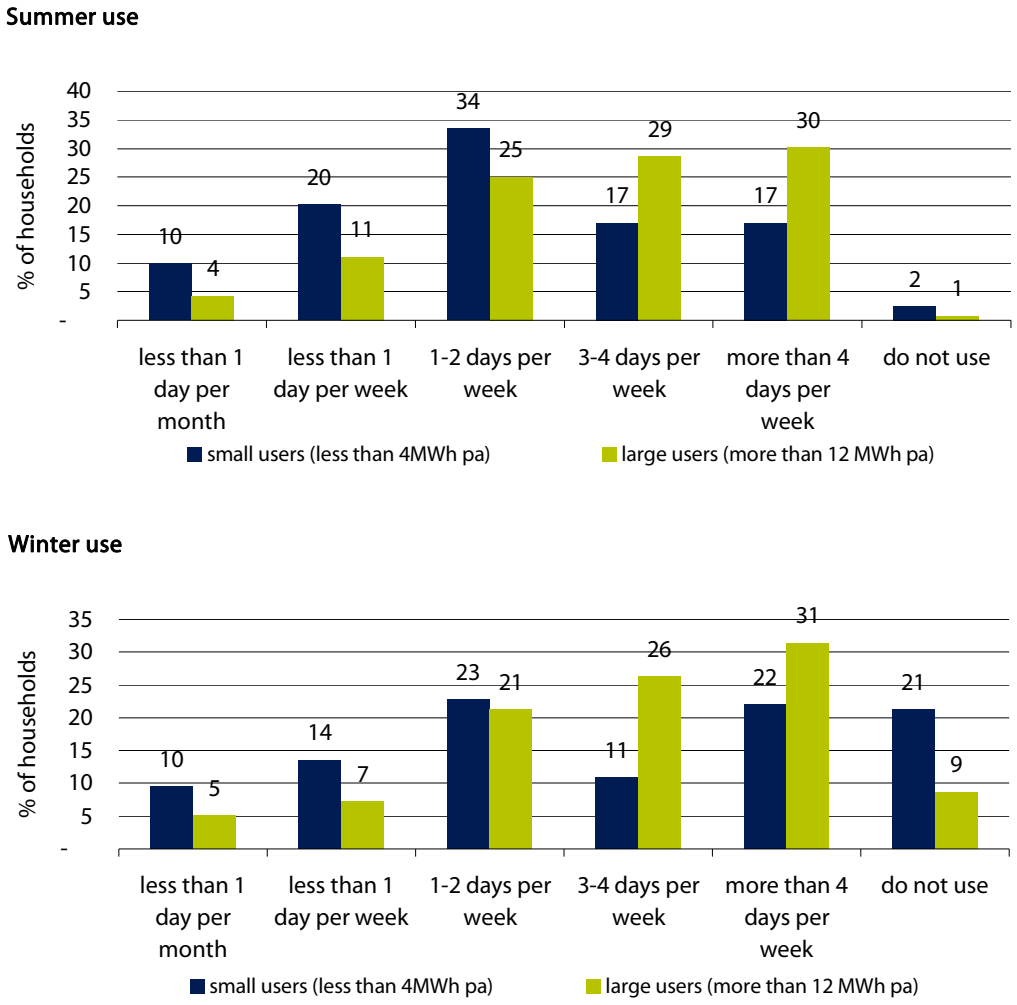
4.4.5 Relationship between using an air conditioner and electricity consumption

The amount of electricity a household uses depends on how much they use their air conditioner rather than whether or not they have one. Therefore, we asked households how often they used their air conditioners in summer and in winter (if they had reverse cycle air conditioning), and for how many hours per day they switched them on.

With respect to summer use, 75% of all households with an air conditioner indicated that they use it at least 1 day per week. About 67% of small electricity users indicated that they use it a least 1 day per week, and 84% of large electricity users indicated that they use it at least this often. Further comparing the usage patterns of large and small users, we found that large electricity users were much more likely to use their air conditioner 3 or more days per week than small energy users (Figure 4.19).

[45] For 2 person households in free-standing houses, 14% of those with air conditioners also had swimming pools compared to 4% of those without air conditioners. For 4 person households in free-standing houses, 21% of those with air conditioners also had swimming pools compared to 8% of those without air conditioners.

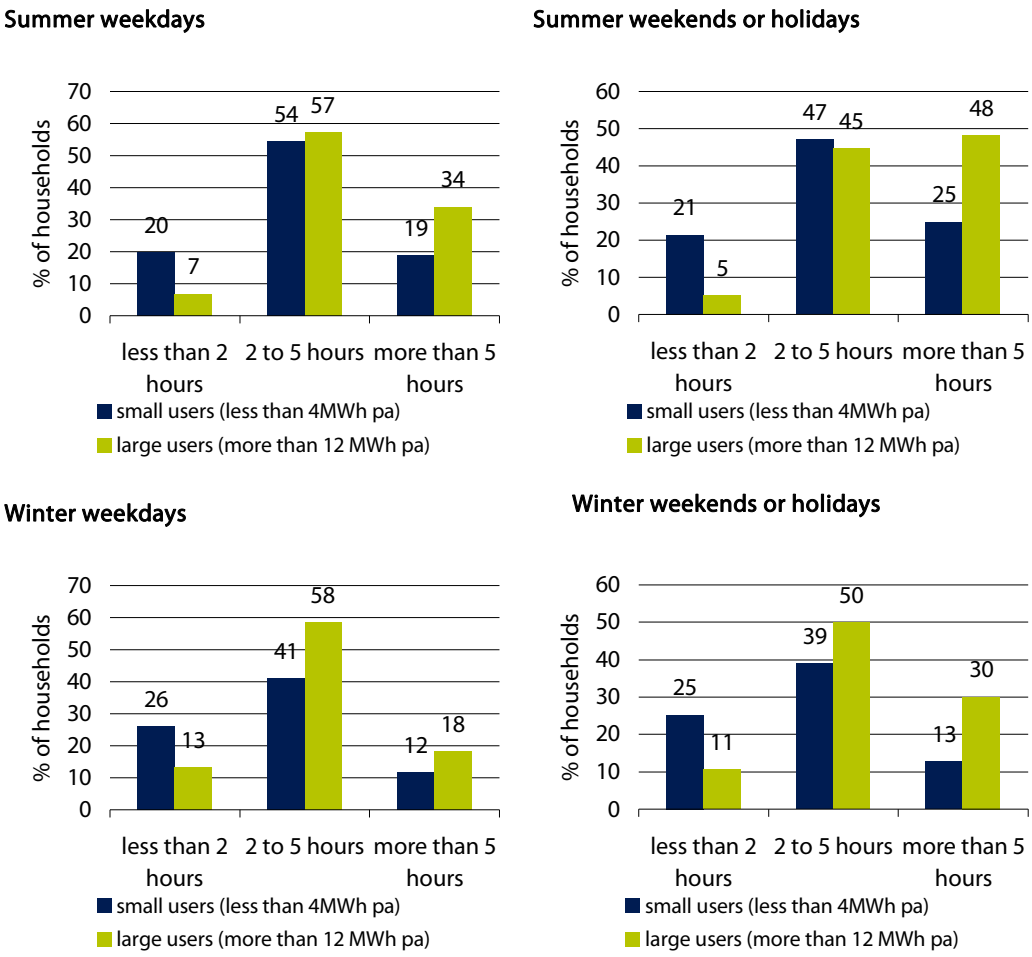
Figure 4.19 How often households that have an air conditioner use it, Sydney (2010) (% of households)



With respect to winter use, 68% of households with reverse cycle air conditioning indicated that they use it at least 1 day per week, including 56% of small electricity users and 79% of large electricity users. We found that a significantly larger proportion of small users than large users did not use their air conditioner for heating (21% of small users compared to 9% or large users). We also found that, like in summer, large electricity users were more likely to use their air conditioner 3 or more days per week in winter than small electricity users (Figure 4.19).

As previously mentioned, electricity consumption depends not only on how many days per week air conditioners are used, but also on how many hour per day they are used. We found that, compared to small electricity users, a significantly higher proportion of large electricity users switched their air conditioners on for 5 or more hours a day in summer (week days and weekends or holiday) and for 2 hours or more in winter (weekdays and weekends or holidays) (Figure 4.20).

Figure 4.20 Hours of air conditioner use per day, Sydney (2010) (% of households)



Note: Totals will not add to 100 because the 'do not use' category has been excluded.

4.4.6 Relationship between geographical area and using an air conditioner

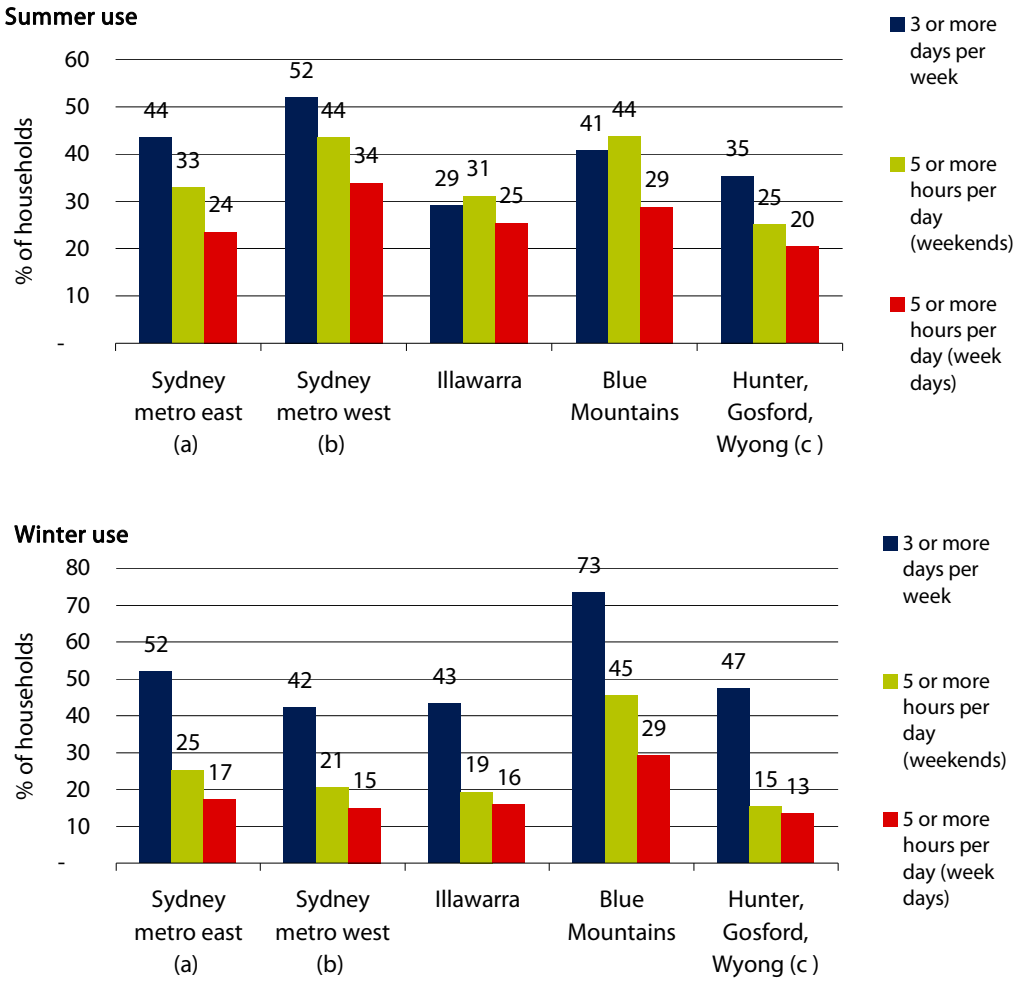
Climatic factors influence both whether or not a household is likely to have an air conditioner, and its usage pattern. We analysed the usage patterns from the 2010 survey for 4 geographical areas: Sydney metropolitan east, Sydney metropolitan west, the Illawarra and the Blue Mountains.[46] The Illawarra is mainly coastal and has a fairly temperate climate. The western (inland) part of the Sydney metropolitan area on average has hotter summers and colder winters than the eastern part. The Blue Mountains has a cooler climate than the other areas, and in particular has the coldest winters. We also looked at usage patterns in the Hunter, Gosford and Wyong areas, which are mainly coastal.

46 We defined Sydney metropolitan east to be that part of the Sydney metropolitan area that is in EnergyAustralia's network area. We defined Sydney metropolitan west to be that part of the Sydney metropolitan area that is in Integral Energy's network area.

Comparing regions, for households in free-standing houses with air conditioners we found that (Figure 4.21):

- Households in the Blue Mountains use their air conditioners more than households in any of the other region during winter. Some 73% of households in the Blue Mountains used them on 3 or more days per week in winter (compared to 42% to 52% in the other regions). In terms of hours of use, 45% used them for 5 hours or more per day during weekends and public holidays (compared to between 15% and 25% in the other regions) and 29% used them for more than 5 hours per day during the week (compared to between 15% and 17%).
- Households in the western part the Sydney metropolitan area use their air conditioners more than households in any of the other regions during summer. Roughly half of households (52%) in this region used them on 3 or more days per week during summer (compared to 29% to 44% in the other regions). They also use air conditioners for relatively long periods each day (hours per day).
- Household in the Illawarra use their air conditioners less than households in the other regions in Sydney, especially in summer.
- Usage patterns in the Hunter, Gosford and Wyong areas were more like those in the Illawarra and Sydney metropolitan east than in Sydney metropolitan west and the Blue Mountains.

Figure 4.21 Summer and winter use of air conditioners by geographical area, Sydney (2010) and Hunter, Gosford, Wyong (2008) (% of households in free-standing houses)



a 'Sydney metropolitan – east' includes the part of the Sydney metropolitan area that is in EnergyAustralia's network area.

b 'Sydney metropolitan – west' includes the part of the Sydney metropolitan area that is in Integral Energy's network area.

c The analysis for the Hunter, Gosford and Wyong areas is for all dwelling types. In the survey sample, 88% were free-standing houses, 9% were semi-detached dwellings and 3% were flats.

4.5 Relationship between hot water systems and electricity consumption

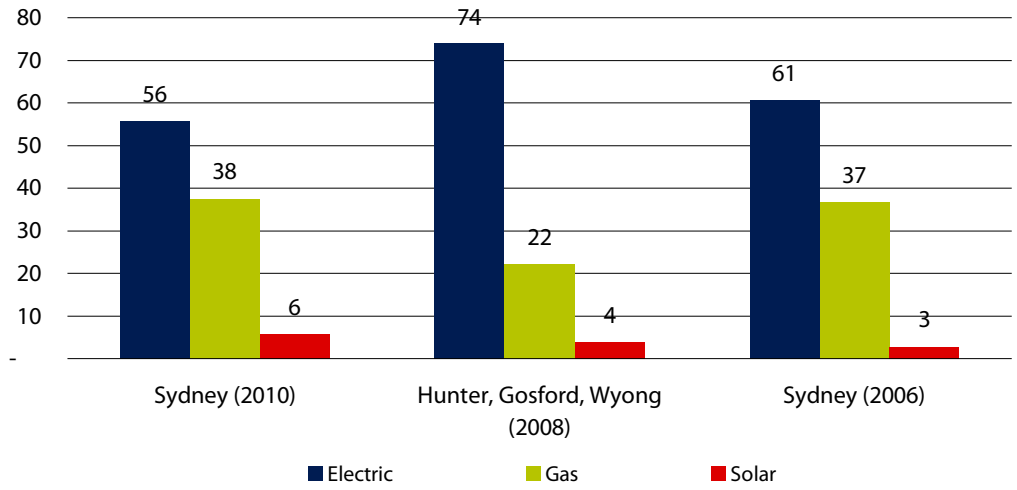
Hot water systems consume large amounts of energy, and both the NSW Government and the Commonwealth Government have provided incentives for a number of years to encourage households to replace electric hot water systems with either gas or solar hot water systems (see Chapter 3, Box 3.2 and Box 3.3). To better understand energy use for hot water systems in our survey areas, we asked households whether the main source of energy for their hot water system was electricity, gas, solar, wood or another source.

4.5.1 The relationship between region, dwelling type and type of hot water system

We found that just over half of households in Sydney in 2010 used electric hot water systems as their main source for hot water, while 38% used mainly gas hot water systems and 6% had solar powered systems (most of which were electricity boosted). Less than 0.5% of households used wood or another source of fuel for hot water (Figure 4.22).

Compared to Sydney, a far higher proportion of households in the Hunter, Gosford and Wyong areas had electric hot water systems in 2008 (74%) and a lower proportion had gas systems (22%). This reflects the more limited availability of mains gas in these areas (Figure 4.22).

Figure 4.22 Proportion of households with electricity, gas and solar hot water systems (%)

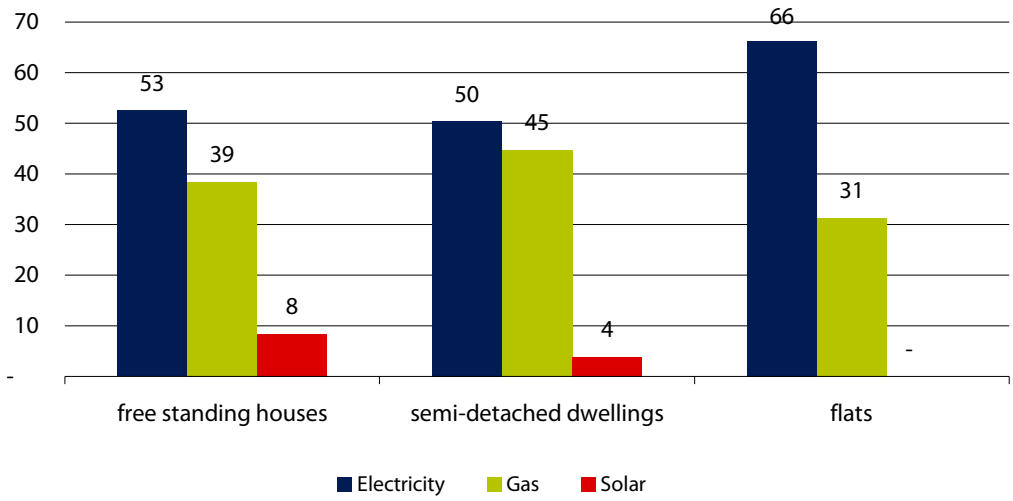


The proportion of respondents in Sydney who had an electric hot water system was slightly lower in 2010 (56%) than in 2006 (61%). This has been accompanied by an increase in the use of solar hot water systems (from 3% to 6%). This decrease in the use of electricity for hot water may be part of the reason why the number of

residential customers on a controlled load tariff was lower in 2005/06 than it had been in 2009/10 (see Chapter 3).

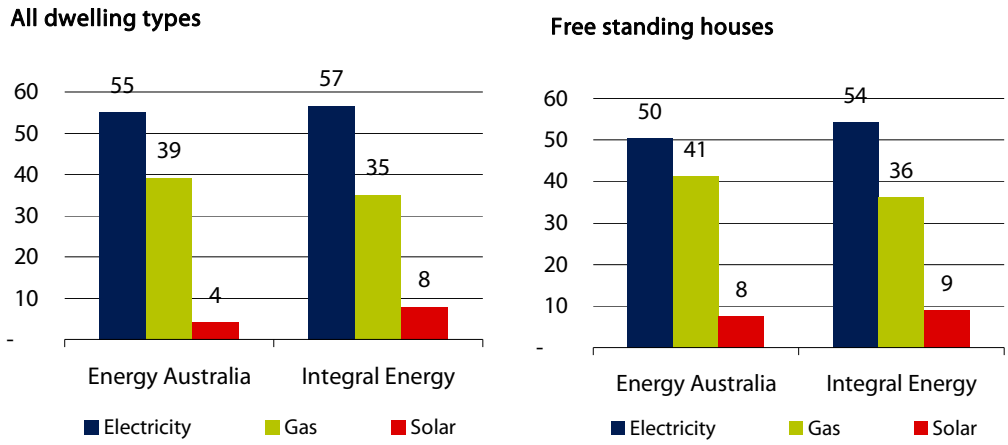
Looking at hot water systems by dwelling type in Sydney (2010), we found that a higher proportion of households in free-standing houses had solar hot water systems (8%) than households in semi-detached dwellings (4%). Households in flats were the most likely have electric hot water systems (66%), and no flats had solar hot water systems. Households in semi-detached dwellings were somewhat more likely to use gas for hot water (45%) than households in free-standing houses (39%) (Figure 4.24).

Figure 4.23 Proportion of households with electricity, gas and solar hot water systems by dwelling type, Sydney (2010) (%)



Looking at hot water systems by network area, we found that a higher proportion of households in Integral Energy's area had solar hot water systems (8% compared to 4% in EnergyAustralia's network area). However, this is mainly because of the predominance of free-standing houses in Integral Energy's network area (81% of all dwellings in Integral Energy's network area are free-standing houses, compared to 49% in EnergyAustralia's area). Comparing hot water systems in the 2 network areas for free-standing houses only, we found that the incidence of solar hot water system was very similar (8% and 9%). We also found that 5% fewer households in Integral Energy's area had gas hot water systems (Figure 4.24).

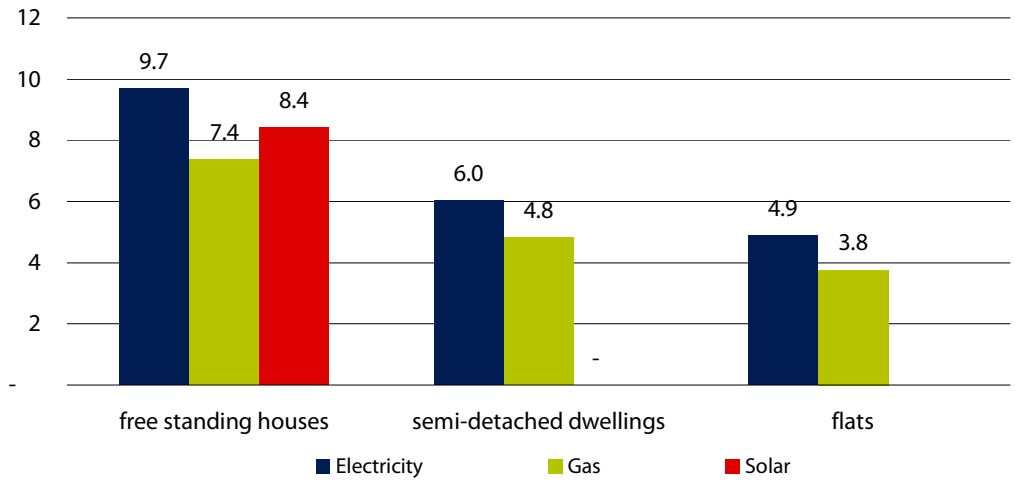
Figure 4.24 Proportion of households with electricity, gas and solar hot water systems by network area, Sydney (2010) (%)



4.5.2 The relationship between hot water systems and electricity consumption

Households that have electric hot water systems on average use more electricity than households with gas or solar hot water systems. For example, looking at households that live in free-standing houses, we found those with electric hot water systems used on average 2.3 MWh per year (31%) more than households with gas hot water systems, and 1.3 MWh per year (15%) more than those with solar hot water systems. Of households that live in semi-detached dwellings and flats, those with electric hot water systems used 1.2 MWh (24%) and 1.1 MWh per year (30%) more electricity respectively than households with gas hot water systems (Figure 4.25).

Figure 4.25 Average electricity consumption for households by hot water system and dwelling type, Sydney (2010) (MWh pa)



Note: Average consumption for households that live in semi-detached dwellings and have solar hot water systems is not shown for due to the small sample size. No households that lived in flats had a solar hot water system.

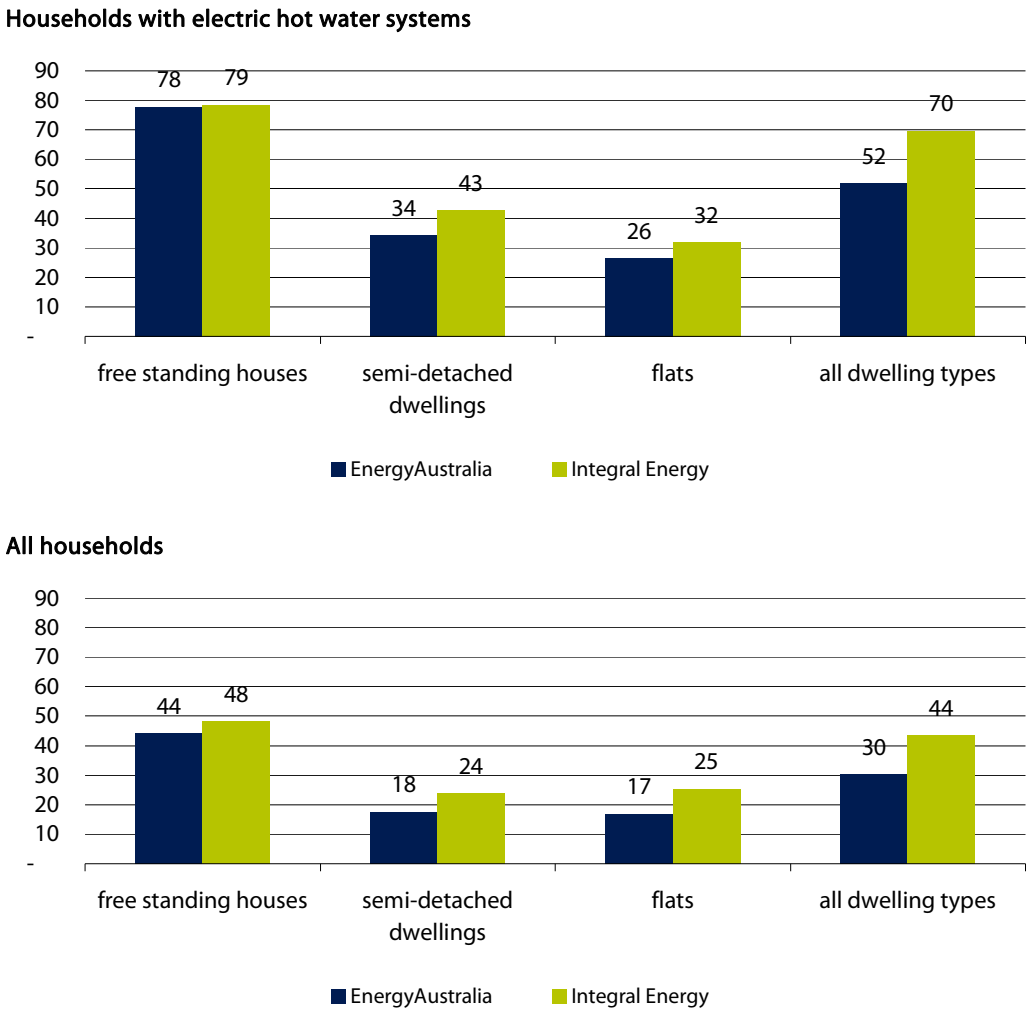
Again, the differences in electricity consumption between households that have an electric hot water system and those that have a gas or solar hot water system cannot be interpreted as the incremental effect of having an electric hot water system. This is particularly true for the difference in consumption between households with an electric or a gas hot water system because, as discussed in Chapter 5 below, most households that use gas for hot water also use it for at least 1 other purpose. The differences in electricity consumption therefore reflect the use of gas not only for hot water but also for cooking and/or space heating. Other household and usage characteristics, such as the number of occupants and appliances used, are also likely to account for some of the observed difference in electricity consumption.

4.5.3 Off-peak hot water systems

Some households with electric hot water systems have off-peak (or controlled load) systems. This means that the network provider (EnergyAustralia or Integral Energy in our survey regions) switches the hot water system's electricity supply on and off. For most households, water is heated during off-peak hours (10 pm to 7am).

We asked respondents with electric hot water systems whether they had off-peak systems. We found that households that live in free-standing houses were far more likely to have off-peak systems than households that live in semi-detached dwellings or flats. We also found that households in Integral Energy' network area were somewhat more likely to have off-peak systems than those in EnergyAustralia's area (mainly but not only because a higher proportion lived in free-standing houses) (Figure 4.26).

Figure 4.26 Proportion of households with off-peak hot water systems, Sydney (2010) (% of households)



Note: The first chart shows households with off-peak hot water systems as a proportion of those households that have electric hot water systems. The second chart shows households with off-peak hot water systems as a proportion of all households, regardless of the type of hot water system they have.

4.6 How many households have ceiling insulation?

Ceiling insulation reduces the need for space heating and cooling, so can help reduce energy consumption. As noted in Chapter 3, the NSW Government and the Commonwealth Government provided rebates for ceiling insulation as part of their energy and water saving measures. The NSW scheme started in July 2007 and ended in June 2009, and the (more generous) Commonwealth scheme started in February 2009 and ended in February 2010[47] (see Box 3.3 and Box 3.4).

[47] The NSW scheme provided a rebate of up to $300 per while the Commonwealth scheme initially provided a rebate of up to $1,600, which was reduced to $1,200 in November 2009.

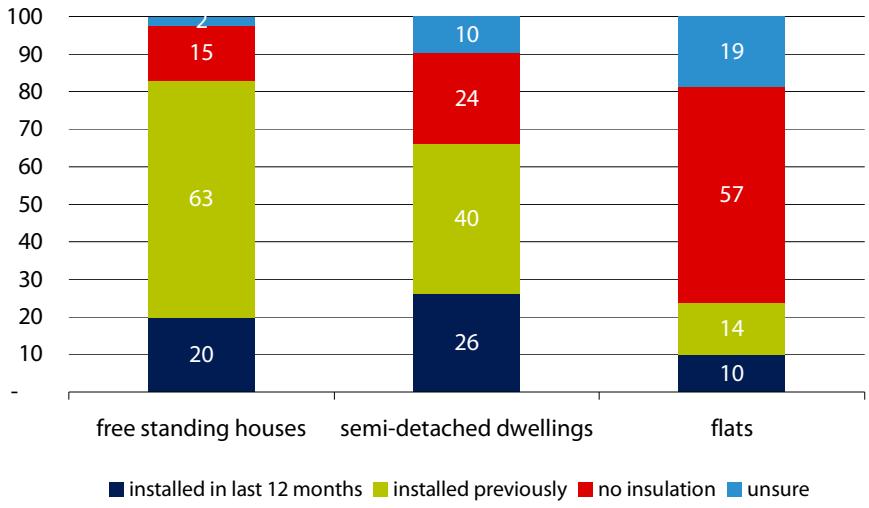
To shed some light on the incidence of ceiling insulation and the take-up of these rebates, our 2010 survey asked respondents whether they had ceiling insulation and, if so, whether it had been installed in the previous 12 months.

4.6.1 The relationship between ceiling insulation and dwelling type

We found that overall, at least 47% of households had ceiling insulation for more than 12 months prior to the survey, and a further 18% had installed it in the 12 months prior to the survey. About 7% were unsure whether or not they had ceiling insulation and 27% definitely did not have it.

Households that live in free-standing houses were the most likely to have ceiling insulation (83% were sure they had it), and household living in flats were the least likely have it (24% were sure they had it). Households in flats were the most likely to be unsure whether or not they have ceiling insulation (19% compared to 10% of households in semi-detached dwellings and 2% of households in free-standing houses) (Figure 4.27).

Figure 4.27 Proportion of households with ceiling insulation by dwelling type, Sydney (2010) (%)



Note: A few households (about 1%) had insulation but were unsure when it was installed. These households have been included in the 'installed previously' category.

Households that live in semi-detached dwellings were the most likely to have had installed ceiling insulation in the previous 12 months (26%), followed by households in free-standing houses (20%). Only 10% of households that live in flats had installed ceiling insulation in the previous 12 months (Figure 4.27).[48]

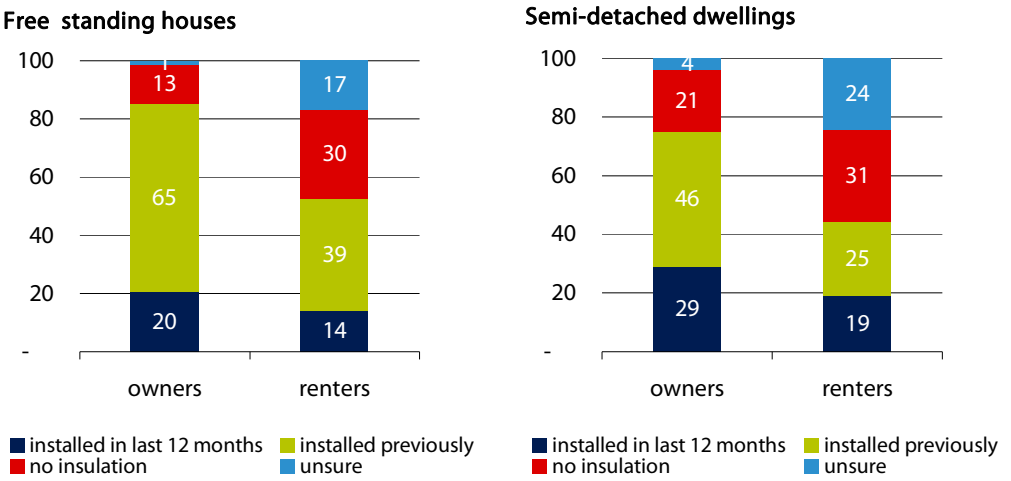
[48] Ceiling insulation is installed in the space between the ceiling and the roof, and many flats do not have this space.

4.6.2 The relationship between ceiling insulation and ownership status

Looking at ceiling insulation in free-standing houses and semi-detached dwellings, those occupied by their owners were more likely than rental properties to have insulation. We found that 85% of owner-occupiers in free-standing houses were certain their dwellings had ceiling insulation, compared to 53% of renters. Also, renters were more likely than owners to be unsure whether or not their dwellings had ceiling insulation (Figure 4.28).

Dwellings occupied by their owners were also more likely than rental properties to have had ceiling insulation installed in the previous 12 months (Figure 4.28). This suggests that owner-occupiers were more likely than landlords to make use of the rebates available during that period.

Figure 4.28 Proportion of households with ceiling insulation by ownership status and dwelling type, Sydney (2010) (%)



Note: A few households (about 1%) had insulation but were unsure when it was installed. These households have been included in the 'installed previously' category.

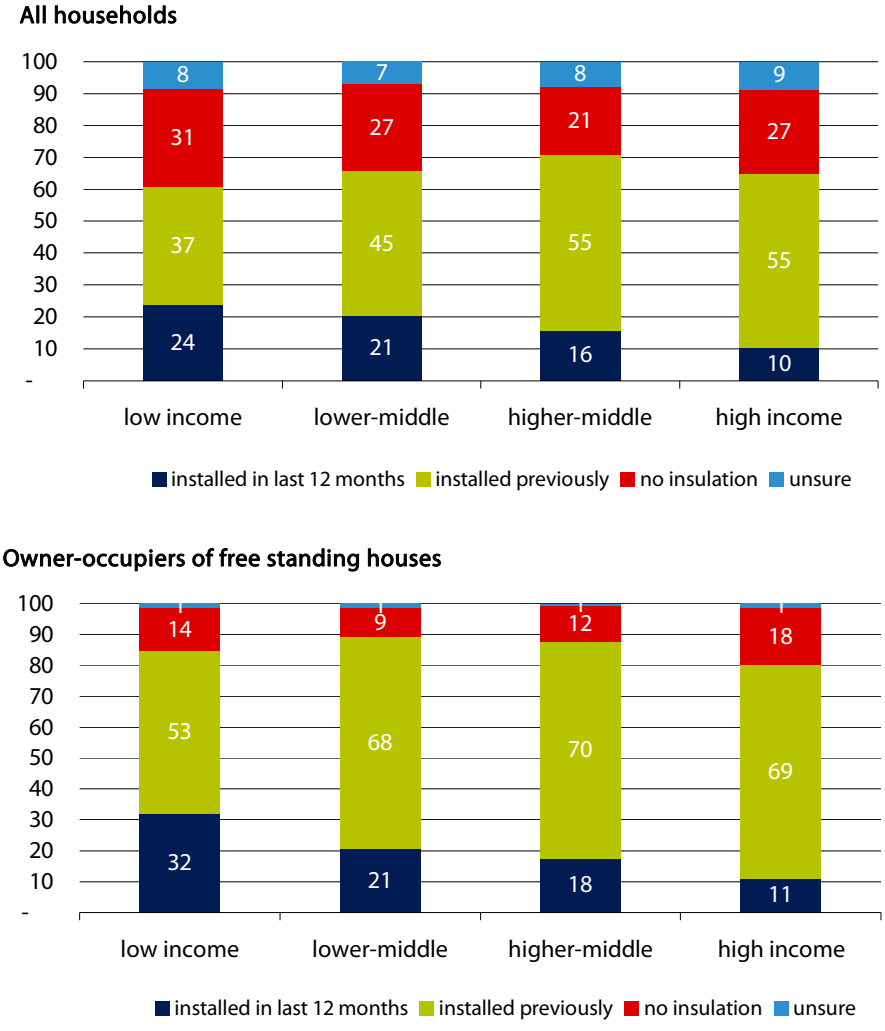
4.6.3 The relationship between ceiling insulation and income

On average, low-income households were more likely than high-income households to have had ceiling insulation installed in the previous 12 months (24% compared to 10%). Also, while low-income households were less likely to have had ceiling insulation prior to the recent installation (37% compared to 55%), they were almost as likely as high-income households to have insulation as a result of the recent installation (61% compared to 65%) (Figure 4.29).

Low-income households are more likely than high-income household to live in flats and to be renting their dwellings (see Chapter 7, Table 7.1). As previously discussed, dwelling type and ownership status have an impact on the likelihood of having ceiling insulation. To better investigate the effects of income status on ceiling

insulation, we analysed the responses for owner-occupiers in free-standing houses only.[49] Again, we found that low-income owner-occupiers were more likely than their higher income counterparts to have had ceiling insulation installed in the previous 12 months. We also found that, after the recent installation, 80% or more of all owner-occupiers in free-standing houses had ceiling insulation regardless of their incomes (Figure 4.30).

Figure 4.29 Proportion of households with ceiling insulation by income category, Sydney (2010) (%)



Note: A few households (about 1%) had insulation but were unsure when it was installed. These households have been included in the 'installed previously' category.

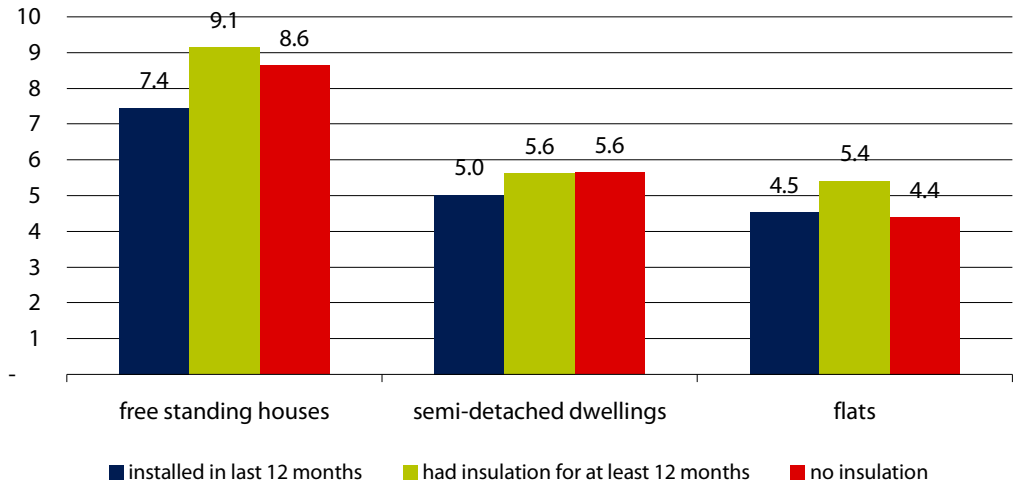
[49] Owner-occupiers in free-standing houses constituted 57% of our survey sample (after applying weights).

4.6.4 The relationship between ceiling insulation and electricity consumption

The relationship between having ceiling insulation and electricity consumption is unclear, and is complicated by the other characteristics of households with and without ceiling insulation.

As a first step in our analysis, for each dwelling type we looked at the average consumption for households that had ceiling insulation for at least 12 months prior to the survey. We then compared this to the average consumption for households that did not have ceiling insulation. We found that the households that had ceiling insulation for at least 12 months on average consumed slightly *more* electricity than the households that did not have ceiling insulation. We also found that the households that had installed ceiling insulation in the previous 12 months on average consumed the least (Figure 4.30).[50]

Figure 4.30 Average consumption of households with and without ceiling insulation by dwelling type, Sydney (2010) (MWh pa)



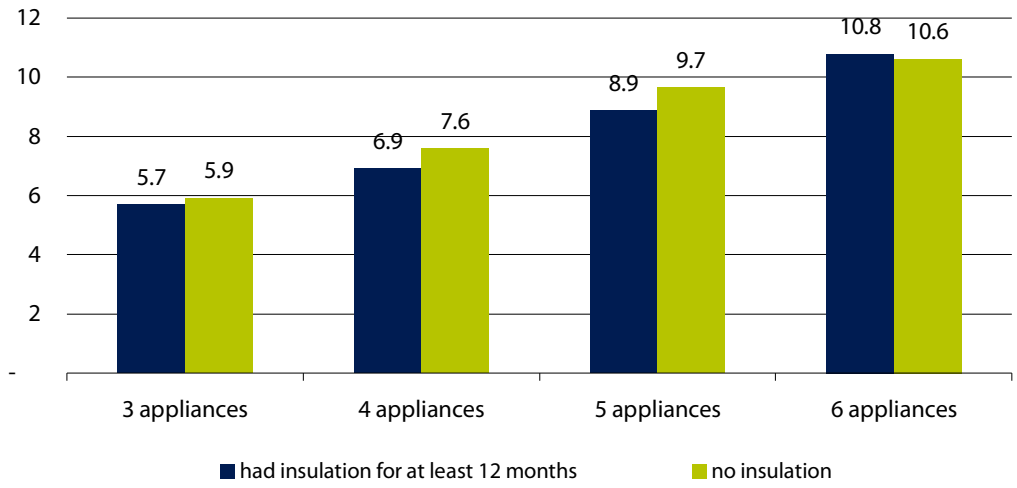
These findings suggest that the other characteristics of household (such as number of occupants, income and the number of appliances) have a stronger impact on average consumption than whether or not the dwelling has ceiling insulation.

In an attempt take some of these other characteristics into account, we looked at the number of large electric appliances that households in free-standing houses had. We then compared the electricity consumption of households with or without ceiling insulation but with the same number of appliances. We found that households with 4 or 5 appliances that had ceiling insulation for at least 12 months used slightly less electricity than households with no insulation (0.7 to 0.8 MWh, or 8% to 9% less). But for households with either 3 or 6 appliances, we found very little difference in

[50] Note that ceiling insulation was installed sometime during the period for which we have consumption data for this group of households.

consumption between those that had ceiling insulation for at least 12 months and those that did not have insulation (4% less and 2% more respectively) (Figure 4.31).

Figure 4.31 Average consumption of households in free-standing houses with and without ceiling insulation by number of appliances, Sydney (2010) (MWh pa)



This does not suggest that ceiling insulation has no impact on energy consumption. One way to properly test the impact would be to measure consumption before and after installation. Unfortunately, we did not have sufficient information to do this.

5 Gas consumption

While all households use electricity, only some households use gas as a source of domestic energy. As part of our 2010 household survey, we asked participants whether they use gas as a source of domestic energy, and if so, whether they use mains gas or gas stored in large cylinders on their properties.[51] Of those participants who use mains gas, we identified the household characteristics associated with consuming large and small volumes of gas (eg, household size, structure, income, dwelling type). We also asked participants what they use mains gas for.

Our analysis of the survey data indicates that:

- Around half of Sydney households were connected to mains gas in 2010, compared to less than one-third of households in the Hunter, Gosford and Wyong areas in 2008. Cylinder gas is seldom used in the Sydney metropolitan area, but is more commonly used in the Blue Mountains, the Illawarra and the Hunter, Gosford and Wyong areas.
- On average, households in Sydney used somewhat less gas in 2010 than they did in 2006.
- On average, households in the Blue Mountains used more gas each year than those in the other areas.
- Compared to households without gas and small gas users, large gas users are more likely to have more occupants, comprise couples with children, have higher incomes and live in free-standing houses.
- Most households use gas either for cooking and hot water (2 purposes) or for cooking, hot water and space heating (3 purposes). Space heating is the least common use for gas, particularly for households living in flats.
- The amount of gas that a household uses depends on what it uses gas for, and households that use gas for cooking only use the least.

The sections below discuss these findings in more detail.

[51] Mains gas refers to gas supplied by gas distribution pipes connected to the dwelling. Cylinder gas refers to liquid petroleum gas (LPG) supplied in large cylinders that then connect to the dwelling or appliance.

5.1 Who uses gas?

Around half of Sydney households use mains gas, compared to only 29% of households in the Hunter, Gosford and Wyong areas (Figure 5.1).

The proportion of Sydney households that use cylinder gas is small, but cylinder gas is more commonly used in the Blue Mountains (15%) and the Illawarra (11%) than in metropolitan Sydney (4%). A similarly high proportion of Gosford and Wyong households (both 14%) use cylinder gas.

Figure 5.1 Proportion of survey respondents using gas, Sydney (2010) and Hunter, Gosford, Wyong (2008)

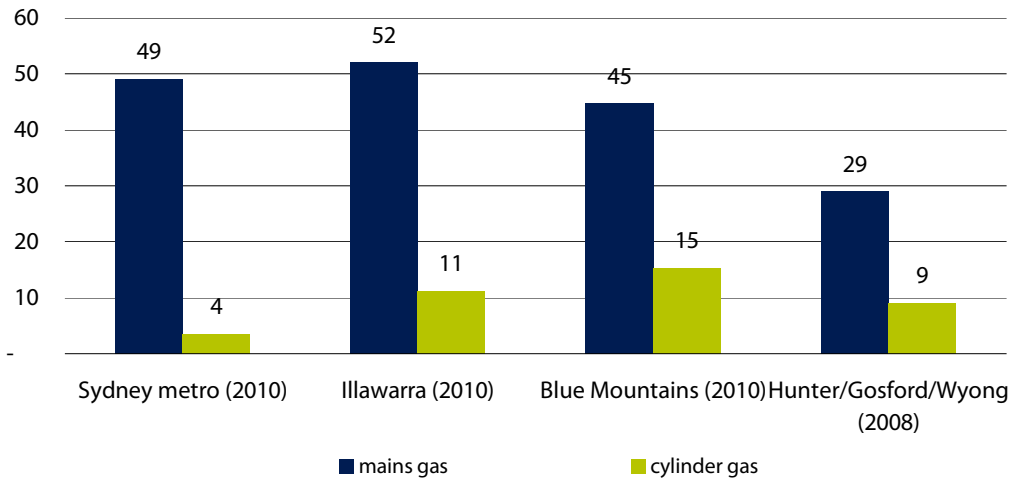


Table 5.1 provides a snapshot of the characteristics of Sydney (2010) households that use mains gas and those that do not use gas. The table also shows the characteristics of corresponding households in the Hunter, Gosford and Wyong areas in 2008 for comparison (in brackets and *italics*).

Compared to households without gas, those that use mains gas are more likely to have more occupants, comprise couples with children, have higher incomes and live in free-standing houses. These findings are generally consistent with the findings in the Hunter, Gosford and Wyong areas (shown in Table 5.1).

However, like for electricity, there are some notable differences between the survey areas that stem largely from differences in their demographic profiles and dwelling types. Specifically, Sydney has proportionately fewer low-income households and proportionately more flats and semi-detached dwellings than the Hunter, Gosford and Wyong areas (See Chapter 3).

Table 5.1 Snapshot: Characteristics of households that use mains gas and that do not use gas, Sydney (2010) and Hunter, Gosford, Wyong (2008)

Mains gas		No gas	
2.8 people per household	*(2.8)*	2.4 people per household	*(2.4)*
18% are 1 person households	*(19%)*	30% are 1 person households	*(27%)*
40% are couples with children	*(42%)*	30% are couples with children	*(30%)*
19% are low-income households[b]	*(35%)*	32% are low-income households[b]	*(47%)*
20% are high-income households[c]	*(13%)*	12% are high-income households[c]	*(7%)*
66% live in a free-standing house	*(91%)*	55% live in a free-standing house	*(86%)*
21% live in a flat	*(na)*	32% live in a flat	*(na)*

a Values for Hunter, Gosford, Wyong (2008) are in brackets and *italics*.

b Households with incomes below $33,800 per year in Sydney (2010) and below $31,200 in Hunter, Gosford, Wyong (2008).

c Households with incomes above $130,000 per year in Sydney (2010) and above $104,000 in Hunter, Gosford, Wyong (2008).

5.2 Average mains gas consumption

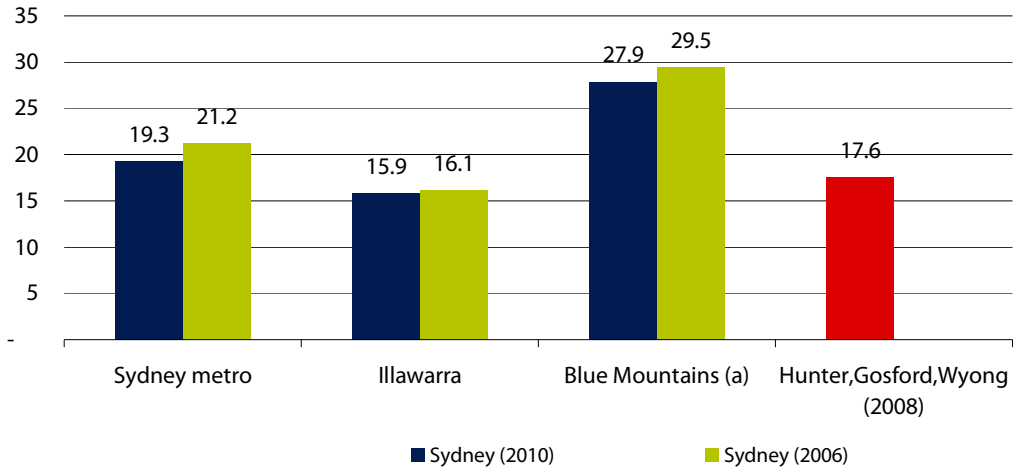
As discussed in Chapter 3, there was a small (5%) decrease in average annual residential consumption of gas in NSW from 2005/06 to 2009/10.[52] Consistent with this trend, we found that average consumption of the households included in our 2010 survey was 8% lower in than the average consumption of the households included in our 2006 survey (19.2 GJ in 2010 compared to 20.9 GJ in 2006). However, like for electricity and water, caution is required when comparing levels of consumption from our 2010 survey with those from our 2006 survey. Some of the observed differences might be due to differences in sampling methodology, and the different methods used to weight the data (see Appendix A).

Looking at regional differences within Sydney, both the 2010 and 2006 surveys indicate that average annual household consumption is highest in the Blue Mountains and lowest in the Illawarra (Figure 5.2). As Chapter 4 discussed, a similar pattern exists in relation to electricity consumption. Like for electricity, these regional differences within Sydney are likely attributable to a combination of climatic, dwelling type and demographic factors to a large extent.

Average consumption in the Hunter, Gosford and Wyong areas was lower than in the Blue Mountains and metropolitan Sydney in 2006 and 2010. A combination of climatic and demographic factors probably accounts for a significant part of these differences.

52 Average residential consumption of gas in NSW was 21.3 GJ per year in 2005/06 compared to 20.2 GJ per year in 2009/10. (Information supplied to IPART by the network operator, Jemena).

Figure 5.2 Average household gas consumption by region, Sydney (2010), Sydney (2006) and Hunter, Gosford, Wyong (2008) (GJ pa)



a Average consumption for the Blue Mountains in 2006 is the unweighted average for a small sample (19) and should be interpreted with caution.

5.3 How do household characteristics affect mains gas consumption?

Of the Sydney households surveyed in 2010 that use mains gas:

- 27% are considered small gas users (consuming less than 10 GJ per annum)
- 56% are considered medium gas users (with 33% consuming 10 to 20 GJ and 23% consuming 20 to 30 GJ per annum 10)
- 17% are considered large gas users (consuming more than 30 GJ per annum). (Figure 5.3).

Figure 5.3 Distribution of households by annual mains gas consumption, Sydney (2010)

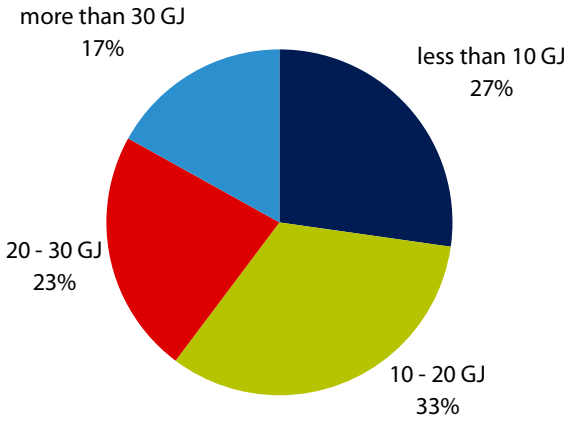


Table 5.2 provides a snapshot of the characteristics of small and large gas users in Sydney in 2010. The table also shows the characteristics of corresponding households in the Hunter, Gosford and Wyong areas in 2008 for comparison (in brackets and *italics*).

The table suggests that large users are more likely to have more occupants (3.7 compared to 2.0), comprise couples with children, have higher incomes and live in free-standing houses. In contrast, small users are more likely to have fewer occupants, comprise 1 person households or couples with no children, have lower incomes and live in flats.

These findings are generally consistent with the findings in the Hunter, Gosford and Wyong areas (shown in Table 5.2). Again, the differences between the survey areas stem largely from differences in their demographic profiles and the higher proportion of free-standing houses in the Hunter, Gosford and Wyong areas (see Chapter 3).

Table 5.2 Snapshot: Characteristics of households that are small and large mains gas users, Sydney (2010) and Hunter, Gosford, Wyong (2008)[a]

Small users (less than 10 GJ per annum)		Large users (more than 30 GJ per annum)[b]	
2.0 people per household	*(2.1)*	3.7 people per household	*(3.5)*
66% are 1 person households or couples with no children	*(67%)*	16% are 1 person households or couples with no children	*(18%)*
15% are couples with children	*(25%)*	68% are couples with children	*(63%)*
27% are low-income households	*(53%)*	9% are low-income households	*(23%)*
14% are high-income households	*(3%)*	32% are high-income households	*(16%)*
53% live in a free-standing house	*(88%)*	86% live in a free-standing house	*(94%)*
32% live in a flat	*(na)*	7% live in a flat	*(na)*

a Values for Hunter, Gosford, Wyong (2008) are in brackets and italics.

b For Hunter, Gosford, Wyong (2008) this category refers to households that used more than 20 GJ per annum. Very few households in these areas used more than 30 GJ per annum.

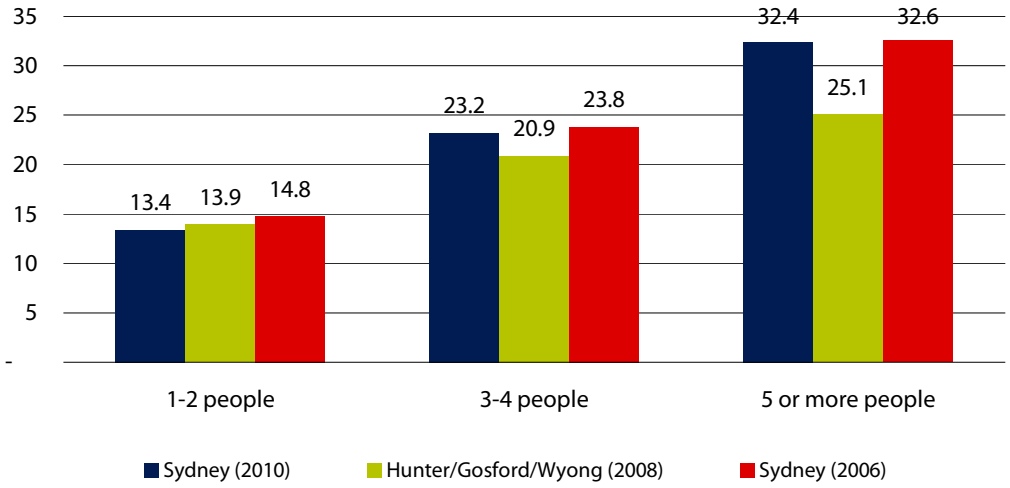
The sections below discuss the relationship between gas consumption and the number of occupants and dwelling type in more detail.

5.3.1 Relationship between the number of occupants and gas consumption

On average, households with more occupants use more gas. For example, in 2010 Sydney households with 5 or more occupants used 19.0 GJ or around 2.4 times more gas than households with just 1 or 2 occupants (Figure 5.4).

We found a similar relationship in Sydney in 2006 and the Hunter, Gosford and Wyong areas in 2008. However, the difference in gas usage between large and small households was not as substantial in the Hunter, Gosford and Wyong areas, with 5 or more person households using around 1.8 times more gas than 1 or 2 person households. The reasons for these regional differences are unclear.

Figure 5.4 Average mains gas consumption by household size, (GJ pa)

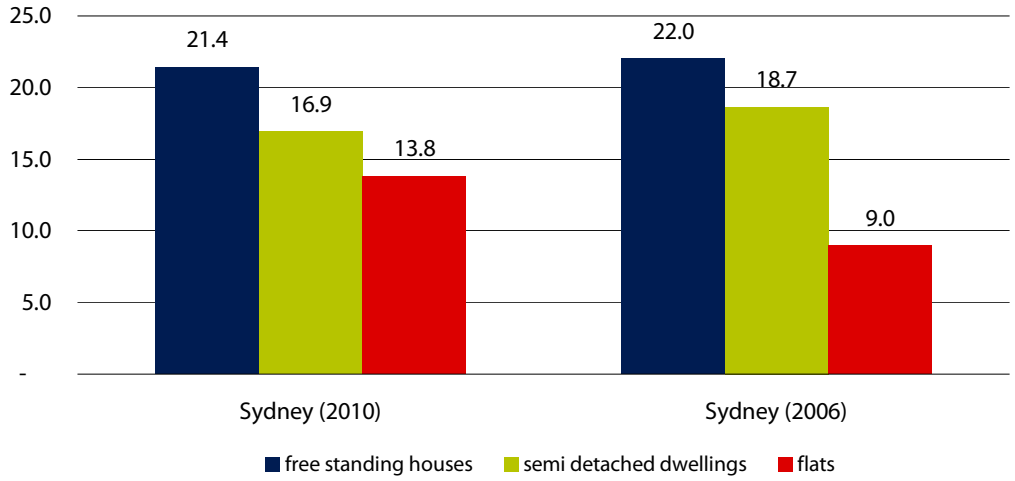


5.3.2 Relationship between dwelling type and gas consumption

Households living in free-standing houses tend to consume more gas than those living in semi-detached dwellings (eg, terrace houses) and flats. For example, in Sydney (2010), households in free-standing houses consumed around 1.3 times more gas than households in semi-detached dwellings, and around 1.6 times more gas than households in flats (Figure 5.5). This is partly because households in flats and semi-detached dwellings tend to have fewer occupants. Another possible reason is that households in semi-detached dwellings and flats make less use of gas for space heating than households in free-standing houses (see section 5.4).

Again, these findings are consistent with the findings for Sydney in 2006.

Figure 5.5 Average mains gas consumption by dwelling type (GJ pa)



5.4 What do households use mains gas for?

To better understand what gas is used for, the 2010 household survey asked respondents about:

- whether they use gas for space heating and/or cooking
- their main source of energy for hot water.[53]

5.4.1 Proportion of households that use mains gas for 1, 2 or 3 purposes

Figure 5.6 shows the proportions of households with mains gas that use it for different purposes. Most Sydney households with mains gas use it for 2 or 3 purposes (78%), mainly cooking, hot water and space heating (33%) or cooking and hot water (31%).

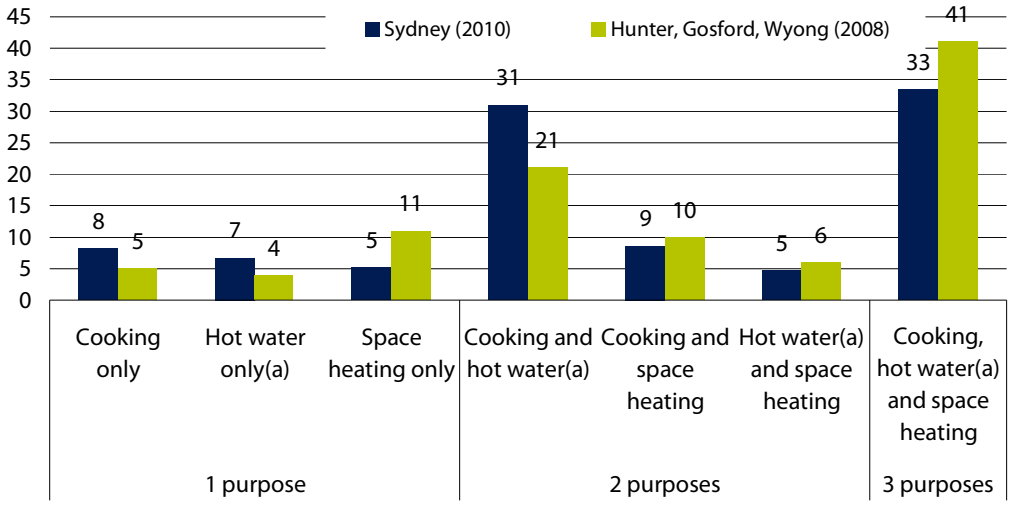
The proportion of households using gas for 2 or 3 purposes is similar in the Hunter, Gosford and Wyong areas (78%). However, when compared to Sydney in 2010, a higher proportion of Hunter, Gosford and Wyong households use gas for all 3 purposes (41%).

The reason for different usage patterns between the survey regions is probably because most households in the Hunter, Gosford and Wyong areas live in free-standing houses. As the next section will discuss, the households that live in free-

[53] We asked households about their *main* (single) source of energy for hot water. For cooking, households could nominate both electricity and gas as their *main* sources of energy. Some households with mains gas did not nominate gas as a source of energy for hot water, cooking or space heating because they use gas only as a secondary source of energy for hot water and/or a minor source of energy for cooking.

standing houses are more likely than households that live in semi-detached dwellings or flats to use gas for space heating.

Figure 5.6 Proportion of households with mains gas that use it for different purposes (%)



a Main source of energy for hot water.

Note: Totals may not add to 100 because we have excluded from the figure those households that use gas as a secondary source of energy for hot water and a minor source for cooking (1% to 2% of households that use mains gas).

5.4.2 Relationship between dwelling type and what gas is used for

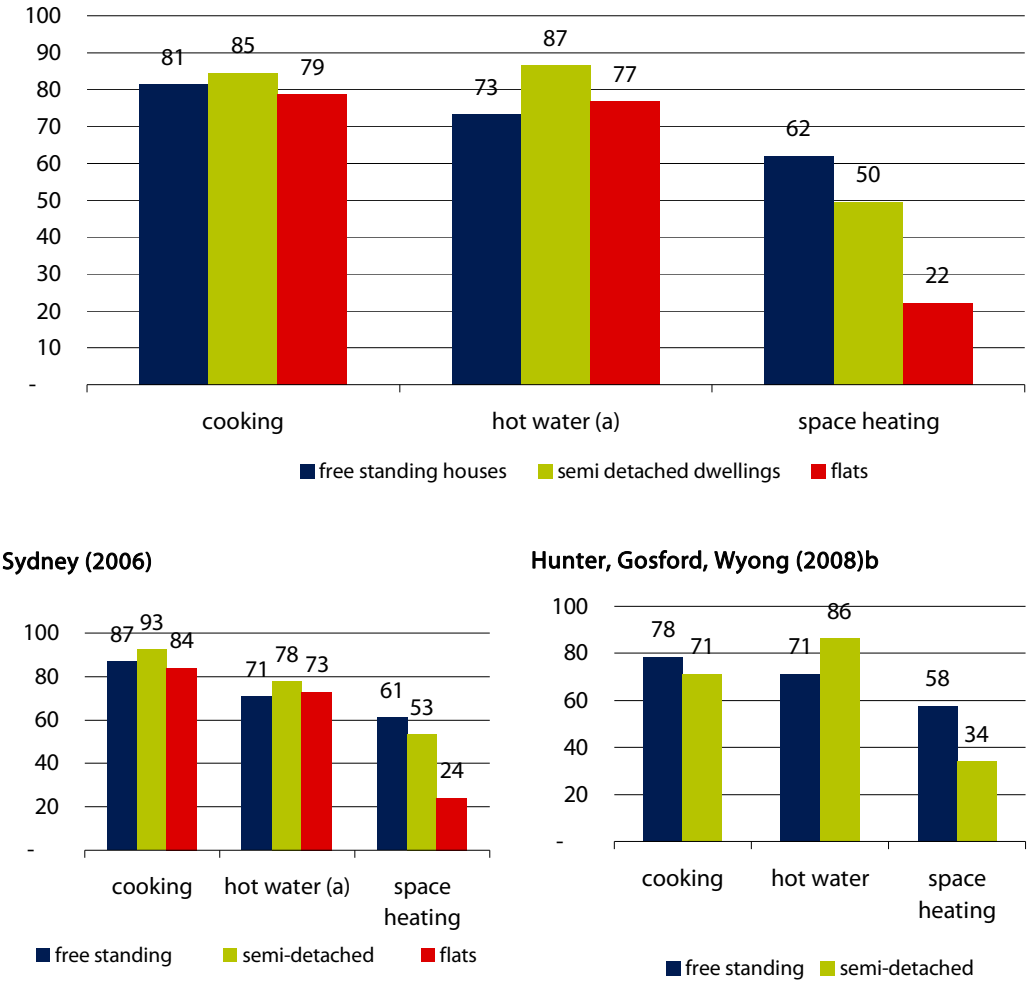
A high proportion of households that use mains gas use it for cooking, regardless of whether they live in a free-standing house, a semi-detached dwelling or a flat. For example, our 2010 Sydney survey found that 81%of households in free-standing houses used it for this purpose, as did 85% of households in semi-detached dwellings and 79% of households in flats.

Similarly, using gas for hot water is common for all dwelling types. In Sydney in 2010, 73% of households in free-standing houses in used it for this purpose, 87% of households in semi-detached dwellings and 77% of households in flats.

Fewer households use gas for space heating than for either cooking or hot water, regardless of their dwelling type. But using gas for space heating is particularly uncommon in flats, with less than a quarter (22%) of Sydney households in flats using it for this purpose (Figure 5.7).

Our 2006 Sydney survey and our 2008 survey in the Hunter, Gosford and Wyong areas showed very a similar pattern of gas usage. However, we were unable to show the pattern of gas usage for households living in flats in the Hunter, Gosford and Wyong areas, due to the small number of such households in our survey sample (Figure 5.7).

Figure 5.7 Proportion of households with mains gas that use it for different purposes, by dwelling type (%)



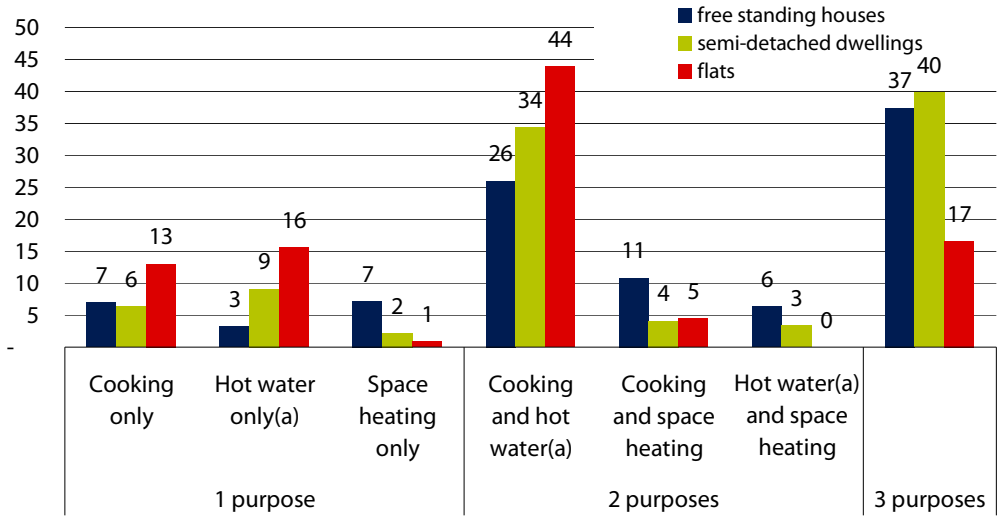
a Main source of energy for hot water.

b Flats in the Hunter, Gosford and Wyong areas are not shown due to the small sample size.

Note: Totals may not add to 100 due to rounding and the exclusion from the figure of households that use gas as a secondary source of energy for hot water and a minor source for cooking (1% to 2% of households that use mains gas).

Figure 5.8 shows the proportions of households (with mains gas) in each type of dwelling that use it for different purposes. In Sydney in 2010, a higher proportion of households living in flats used it for 1 purpose (29%) than households in either free-standing houses (17%) or semi-detached dwellings (18%). Conversely, a far smaller proportion of households living in flats used it for all 3 purposes (17% compared to 37% of households in free-standing houses and 40% of households in semi-detached dwellings).

Figure 5.8 Proportion of households with mains gas that use it for different purposes by dwelling type, Sydney (2010) (%)



a Main source of energy for hot water.

Note: Totals may not add to 100 due to rounding and the exclusion from the figure of households that use gas as a secondary source of energy for hot water and a minor source for cooking (1% to 2% of households that use mains gas

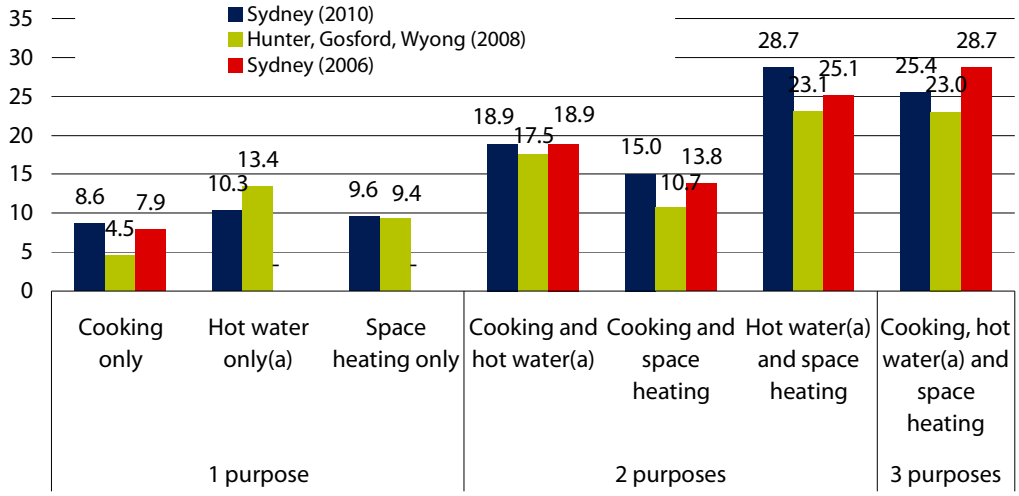
5.4.3 Relationship between gas consumption and what it is used for

Not surprisingly, the amount of gas that a household uses depends on what it uses gas for. As Figure 5.9 shows, Sydney 2010 households that used gas for cooking only consumed the least (8.6 GJ) per year, while those that used it for hot water and space heating consumed and the most (28.7 GJ) per year. Interestingly, households that used gas for these 2 purposes on average consumed more than households that used it for all 3 purposes (25.4 GJ). Part of the reason for this is that households that used it for hot water and space heating were more likely to live in free-standing houses than households that used it for all 3 purposes. The 2 purpose households were therefore likely to have more occupants and generally use more domestic energy.[54]

The results for our 2010 survey are broadly similar to those for Sydney in 2006 and the Hunter, Gosford and Wyong areas in 2008 (Figure 5.9).

[54] Of households that used gas for hot water and space heating, 90% lived in free-standing houses and none lived in flats. Of households that used gas for all 3 purposes, 74% lived in free-standing houses and 11% lived in flats. The relationship between dwelling type and energy usage is discussed in Chapter 4 in relation to electricity usage.

Figure 5.9 Average consumption of households with mains gas that use it for different purposes (GJ pa)



a Main source of energy for hot water.

Note: The values for the Hunter, Gosford and Wyong areas should be interpreted with care due to the small number of observations in some categories. Some values for the 2006 Sydney survey have been excluded due to a very small number of observations.

6 Water consumption

Like in our previous surveys, in the 2010 survey we asked participants a range questions about their water usage. For example, we asked about the number of water using amenities and appliances households have, how often they use them, and whether they made use of alternative water sources such as bore water, grey water[55] or rainwater tanks. We also asked respondents about their outdoor water use. In addition, we asked households to indicate the importance of various aspects of their water supply service, and whether they thought Sydney Water's services represent value for money. Finally, we asked those respondents who were tenants whether they paid the water usage charges.

Like in the previous chapters, we compared the main findings from our 2010 survey to the findings from our surveys in Sydney in 2006 and in the Hunter, Gosford and Wyong areas in 2008. Again, comparisons between survey findings should be treated with caution and in particular comparisons of average consumption.

Our analysis of the survey results indicates that:

- In line with the trend for all Sydney Water's residential customers, the average water consumption of respondents to the Sydney surveys was somewhat lower in 2010 than in 2006.
- The average water consumption of respondents in the Sydney metropolitan area was higher than that of respondents in the Illawarra, the Blue Mountains and the Hunter Gosford and Wyong areas.
- The household characteristics that most influence average water consumption seem to be the number of household occupants, household income, and the dwelling type and land size.
- Tenants' payment arrangements do not seem to have an impact on water consumption.
- The water usage behaviours that most influence average water consumption are whether or not they own and frequently use indoor amenities and appliances (such as dishwashers and washing machines), whether or not they have a swimming pool, and whether or not they water their garden (particularly with a sprinkler).

[55] Grey water refers to wastewater generated from domestic processes such as dish washing, laundry and bathing (http://en.wikipedia.org/wiki/Greywater). For the purposes of this survey, using grey water means using recycling this wastewater on the property.

- The proportion of toilets in Sydney that are dual flush has increased from 66% in 2006 to 77% in 2010.
- The likelihood of households using alternative sources of water to mains water seems to be associated with whether or not the area in which they live has experienced water shortages, and whether or not they have a garden (or an outdoor area).
- Sydney households that used grey water on average used less water than households that used only mains water. However, households that used water from rain water tanks on average used *more* mains water than households that used only mains water (but not *because* they use water from rainwater tanks).
- The aspects of a water supply service that households considered most important are continuity of water supply, water quality and good environmental management. Since 2006, good environmental management and incentives to save water have become more important to households in Sydney. Just over half of respondents in 2010 considered Sydney Water's services to represent value for money.

The sections below discuss these findings in more detail. In interpreting the findings, it is important to note that Sydney, the Hunter, Gosford and Wyong are each supplied by different water suppliers, and face different water supply conditions. The water supply conditions that prevailed at the time of the surveys are discussed in Chapter 3.

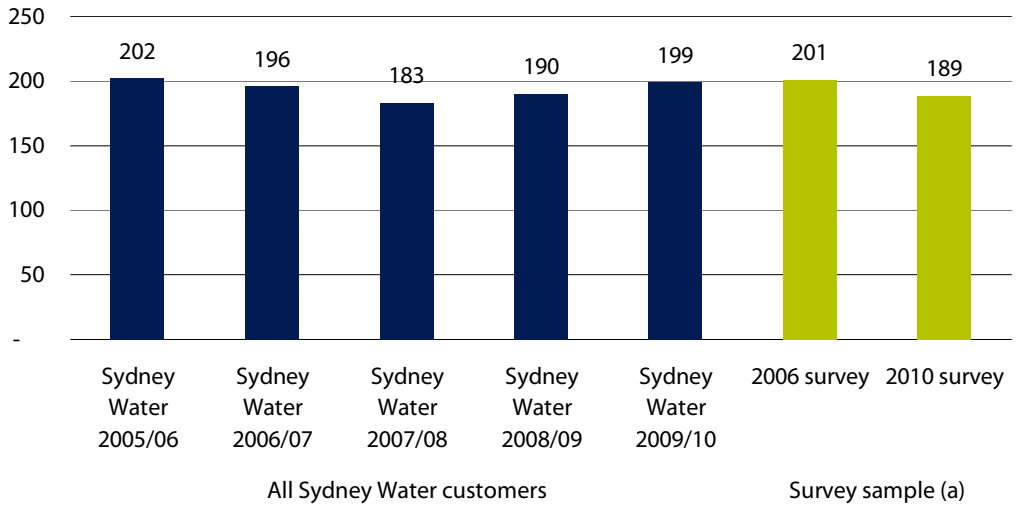
6.1 Average water consumption

6.1.1 Average water consumption in Sydney, 2006 to 2010

Between our 2006 and 2010 surveys, the average water consumption of the households included in these surveys fell by around 6%, in line the change in average consumption for all Sydney Water's residential customers between 2005/06 and 2008/09 to 2009/10 (discussed in Chapter 3). The average consumption in 2010 was 189kL per year (where the year was measured starting in January, February or March 2009, while water restrictions were still in place), compared to 201kL in 2006 (Figure 6.1).

Even though the average consumption from our surveys is fairly close to the average for all Sydney Water customers, caution is required when comparing the findings from our 2010 survey to those from the 2006 survey. Like for electricity and gas, some of the observed differences in consumption might be due to differences in sampling methodology, and the different methods used to weight the data (see Appendix A). Therefore, in this chapter we compare patterns and trends between 2006 and 2010 rather than focus on changes in the actual volume of consumption.

Figure 6.1 Average household water consumption for all Sydney Water customers and for the Sydney (2010) and Sydney (2006) surveys (kL pa)



a Different methods of weighting were used for the 2 sets of survey data. Consumption weights applied to the 2006 survey data to approximate Sydney Water's consumption profile for 2005/06. Combined income, family structure and dwelling type weights applied to the 2010 survey data. The weights are discussed in Appendix A.

Note: Average consumption for the 2010 survey sample was measured for a 12 month period starting in January, February or March 2009, while water restrictions were still in place.

Data source: Calculated by IPART using information provided by Sydney Water, and IPART household surveys.

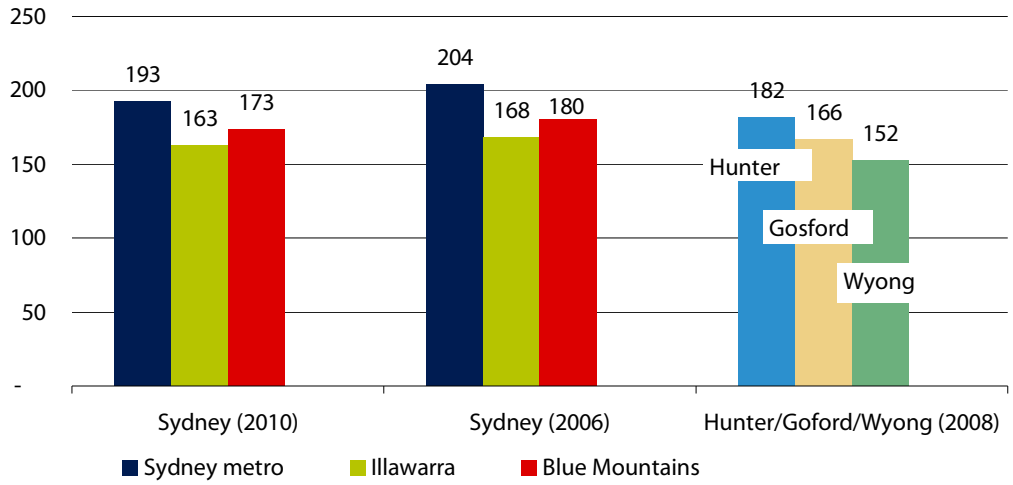
6.1.2 Comparing average water consumption by region

Both the 2010 and 2006 surveys found that the average annual household consumption in the Sydney metropolitan area was higher than in the Illawarra or the Blue Mountains. We also found that the average annual household consumption in the Hunter, Gosford and Wyong areas was lower than in metropolitan Sydney, and that usage in these areas was more like average usage in the Illawarra and Blue Mountains. (Figure 6.2).

Like for electricity, one of the reasons for the higher level of consumption in the Sydney metropolitan area probably lies in its demographic characteristics compared to those of the other regions, particularly in relation to household size (see Chapter 3).

Consumption in the Hunter area was higher than in Gosford and Wyong in 2008. No water restrictions were applied in the Hunter area, whereas fairly stringent restrictions were in place in Gosford and Wyong. But despite the absence of water restrictions, average consumption in the Hunter area (182kL) was similar to that in Sydney in 2007/08 (183kL) when water restriction were in place. This suggests that factors other than water restrictions, such as household size and climate, are also important determinants of household water consumption.

Figure 6.2 Average household water consumption by region, Sydney (2010), Sydney (2006) and Hunter, Gosford, Wyong (2008) (kL pa)



6.2 How do household characteristics affect water consumption?

Of the surveyed households in Sydney in 2010:

- 21% are considered small water users (consuming up to 100 kL per annum)
- 75% are considered medium water users (with 46% consuming 100 to 200kL per annum, 21% consuming 200 to 300 kL and 8% consuming 300 to 400 kL per annum)
- 4% are considered large water users (consuming more than 400 kL per annum) (Figure 6.3).

Figure 6.3 Distribution of households by annual water consumption, Sydney (2010)

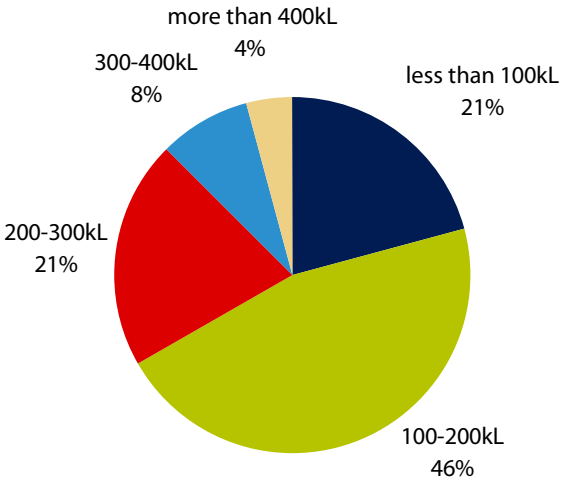


Table 6.1 provides a snapshot of the characteristics of small and large water users in Sydney in 2010. The table also shows the characteristics of small and large water users in the Hunter, Gosford and Wyong areas in 2008 for comparison (in brackets and *italics*).

The table indicates that, on average, large water users in Sydney had more household occupants than small users (4 compared to 1.6). Large water users were also more likely to consist of couples with children, live in free-standing houses and on large blocks of land, have higher incomes and live in the Sydney metropolitan area. Large water users were more likely to make use water from rainwater tanks. Small water users were more likely to use grey water, and to be retirees or pensioners.

These findings are generally consistent with the findings in the Hunter, Gosford and Wyong areas in 2008 (shown in Table 6.1), and in Sydney in 2006. Many of the differences between the survey regions stem from differences in their demographic profiles, for example the Hunter, Gosford and Wyong areas have proportionately more low-income and pensioner households than Sydney.[56] Another important difference between the regions is that Sydney has a far higher proportion of flats and semi-detached dwellings than the Hunter, Gosford and Wyong area (see Chapter 3).

[56] For example, a higher proportion of both small and large users in the Hunter, Gosford and Wyong areas have low incomes and pensioner concession cards. The reason for this is simply that, compared to Sydney, a higher proportion of all households in this region have low incomes (35% compared to 25% in Sydney) and a higher proportion have concession cards (42% compared to 32% in Sydney).

Table 6.1 Snapshot: Household characteristics of small and large water users, Sydney (2010) and Hunter, Gosford, Wyong (2008)[a]

Small water users (less than 100kL per annum)		Large water users (more than 400kL per annum)	
1.6 people per household	*(1.6)*	*4.0 people per household*	*(3.8)*
77% are 1 person households or couples with no children,	*(84%)*	28% are 1 person households or couples with no children,	*(26%)*
5% are couples with children	*(8%)*	62% are couples with children	*(62%*)
54% of respondents are aged over 65	*(65%)*	17% of respondents are aged over 65	*(13%)*
53% have a pensioner concession card	*(71%)*	13% have a pensioner concession card	*(22%)*
46% are low-income households	*(64%)*	9% are low-income households	*(14%)*
5% are high-income households	*(3%)*	30 % are high-income households	*(22%)*
49% live in a freestanding house	*(88%)*	77% live in a freestanding house	*(97%)*
and of these		and of these	
15% live on small blocks of land[b]	*(17%)*	5% in houses live on small blocks of land[b]	*(6%)*
21% live on large blocks of land[b]	*(13%)*	37% live on large blocks of land[b]	*(32%)*
80% live in the Sydney metropolitan area		95% live in the Sydney metropolitan area	
26% use grey water and	*(30%)*	10% use grey water and	*(22%)*
18% use rainwater tanks	*(23%)*	26% use rainwater tanks	*(19%)*

a Values for Hunter, Gosford, Wyong (2008) are in brackets and *italics*.

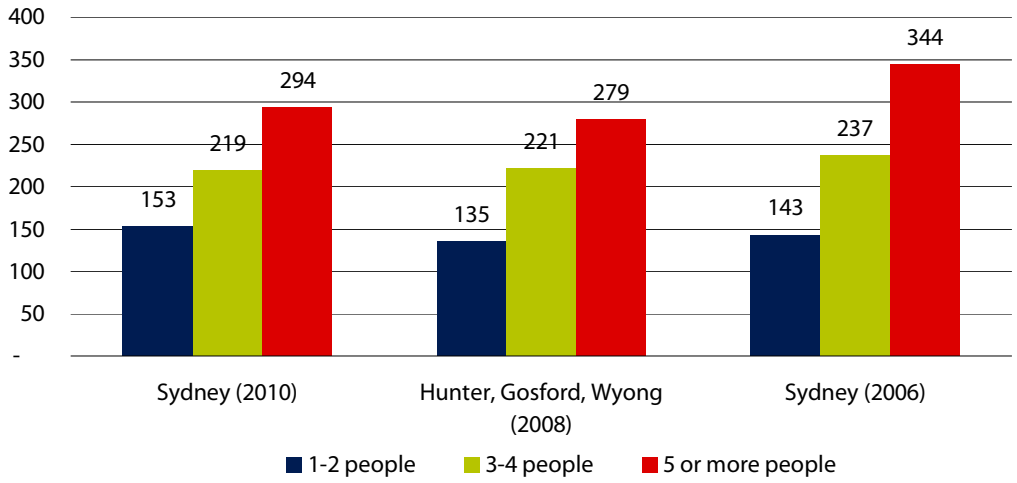
b Small block of land are less than 500m^2, and large block of land are more than 900m^2.

The relationship between consumption and the number of occupants, dwelling type, and land size is examined in more detail below. The use of grey water, water from rainwater tanks and bore water is discussed in section 6.5.

6.2.1 Relationship between the number of occupants and water consumption

On average, households with more occupants use more water. For example in Sydney in 2010, households with 5 or more people used almost twice the amount of households with only 1 or 2 people. We found a similar relationship in the 2006 survey in Sydney and the 2008 survey in the Hunter, Gosford and Wyong areas (Figure 6.4.).

Figure 6.4 Average water consumption by household size (kL pa)

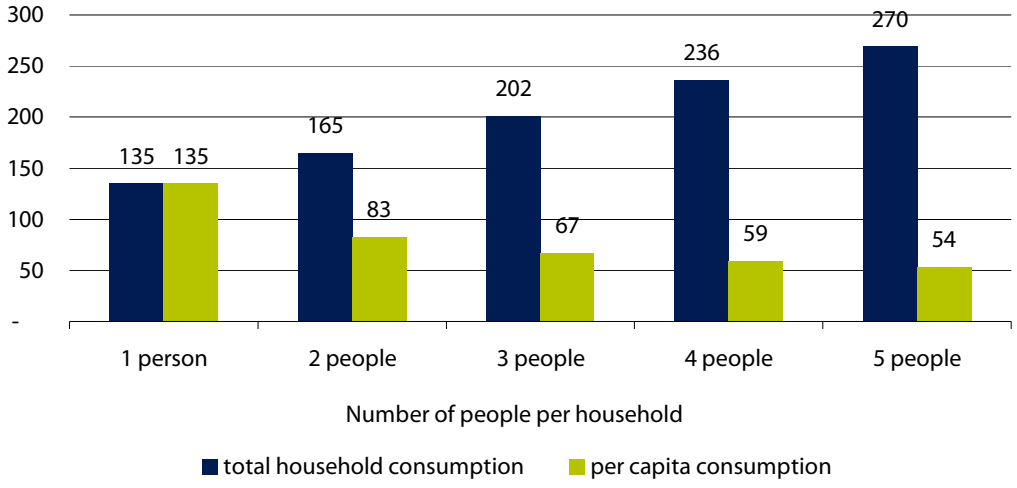


Note: The average consumption for households with 1-2 people in Sydney should be treated with caution because a high proportion of these households live in multi-dwelling units that are bulk billed.

Even though large households use more water, on average they use significantly less water per person than smaller households. For example, in Sydney (2010) the per capita water consumption of households with 5 occupants was 40% of that of 1 person households. These findings indicate that there is a certain amount of shared water usage within a household (Figure 6.5).[57]

[57] To see whether bulk metering influenced these results, we also calculated the per capita consumption for households in individually metered dwellings only. The results were very similar to those for all households.

Figure 6.5 Average household and per capita water consumption by number of occupants, Sydney (2010) (kL pa)



6.2.2 Relationship between water consumption and dwelling type

Households living in free-standing houses tend to consume more water than those living in flats or semi-detached dwellings, such as terrace houses, villa units or town houses. For example in Sydney in 2010, households in free-standing houses consumed on average 39kL (or 24%) more water than those living in semi-detached dwellings. Households in free-standing houses also consumed more than households in flats.[58] Again, these findings are consistent with the findings of the 2008 survey in the Hunter, Gosford and Wyong areas and the 2006 survey in Sydney (Figure 6.6).

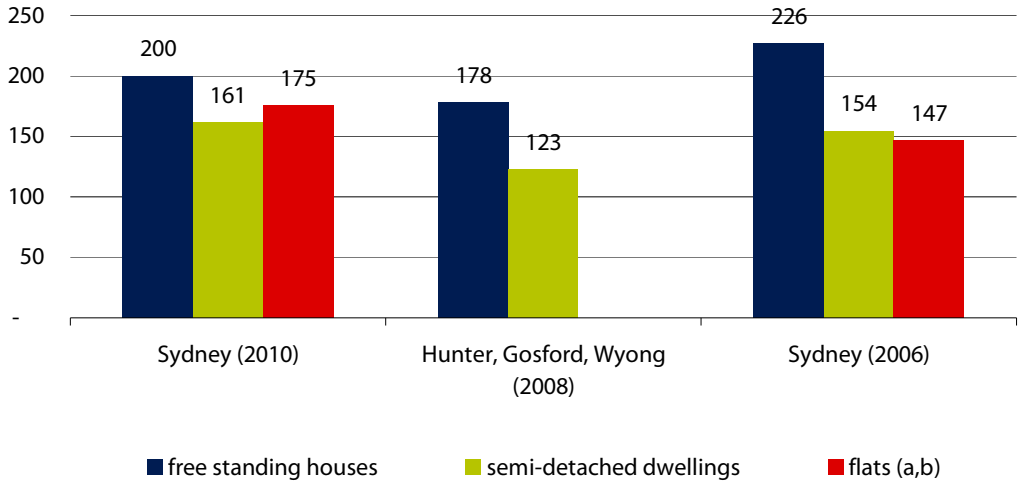
To investigate whether the higher water consumption of households in free-standing houses is simply due to the higher number of occupants, we compared the average consumption per person in households living in free-standing houses and semi-detached dwellings (where the number of occupants was the same and each household was individually metered). We excluded flats from this analysis because most consumption is bulk metered.[59] We found that consumption per person was not consistently higher for households in free-standing houses (Figure 6.7). Unlike for electricity (see Chapter 4), this suggests that the main reason why households in free-standing houses have higher average consumption is because they have more

[58] The reported consumption for households in flats, and changes in that consumption between 2006 and 2010, should be treated with caution. The consumption for households in flats is less accurate than for households in separate houses or semi-detached dwellings because most flats are bulk metered. For households with bulk meters, we attributed an average consumption per dwelling unit (ie, total amount consumed by the block of flats divided by the number of individual units).

[59] See footnote above.

occupants (3 occupants in free-standing houses, 2.2 in semi-detached dwellings and 1.9 in flats in Sydney in 2010).

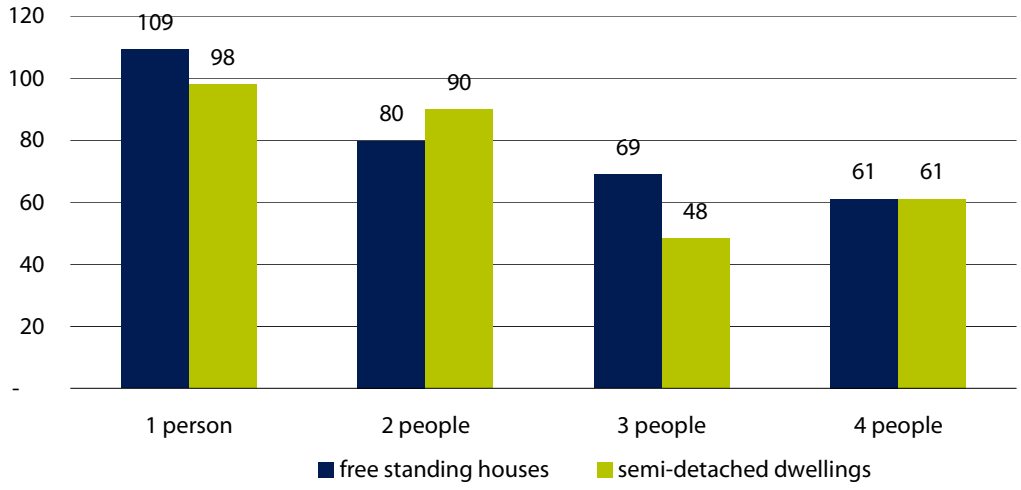
Figure 6.6 Average household water consumption by dwelling type (kL pa)



a Flats in Hunter, Gosford, Wyong (2008) were excluded due to the small sample size.

b The consumption for flats in Sydney is less accurate than for separate houses or semi-detached dwellings because most of the latter are individually metered whereas most flats are bulk metered. For households with bulk meters, we attributed an average consumption per dwelling unit. The level of consumption for households in flats, and changes in consumption between 2006 and 2010, should therefore be treated with caution.

Figure 6.7 Average water consumption per person, by dwelling type and household size (individually metered households), Sydney (2010) (kL pa)

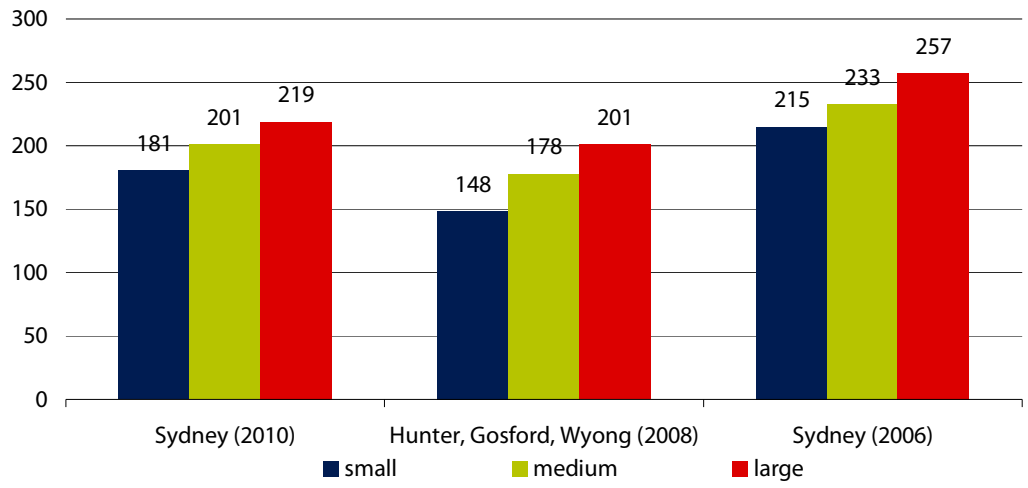


Note: We excluded flats from this analysis because most consumption is bulk metered.

6.2.3 Relationship between land size and water consumption

Average water usage is consistently higher for households in free-standing houses on larger blocks of land. For example, our Sydney 2010 survey found that of households that lived in free-standing houses, those on large blocks of land (greater than 900m^2) consumed 38kL (or 21%) more water than those on small blocks (less than 500 m^2). Our 2008 and 2006 surveys found a similar relationship between land size and water consumption (Figure 6.8).

Figure 6.8 Average water consumption by land size, Sydney (2010), Sydney (2006) and Hunter, Gosford, Wyong (2008) (free-standing houses only, kL pa)



Note: Small means less than 500m^2, medium means 500m^2 to 900m^2 and large means greater than 900m^2.

6.3 Relationship between water consumption and the payment of water usage charge (tenants only)

Some tenants pay their water usage charges directly to their water utility, while in other cases the owner pays to the total bill.[60] We used the Sydney (2010) and Hunter, Gosford, Wyong (2008) survey data to investigate whether paying these usage charges reduces the amount of water used.

We found that tenants who paid their water usage charges often used *more* water than tenants who were not responsible for these payments. For example, tenants renting privately in Sydney in 2010 and paying usage charges used 220kL of water per year compared to 172kL for tenants renting privately and not paying these charges. On the other hand, tenants in public housing in Sydney in 2010 and paying

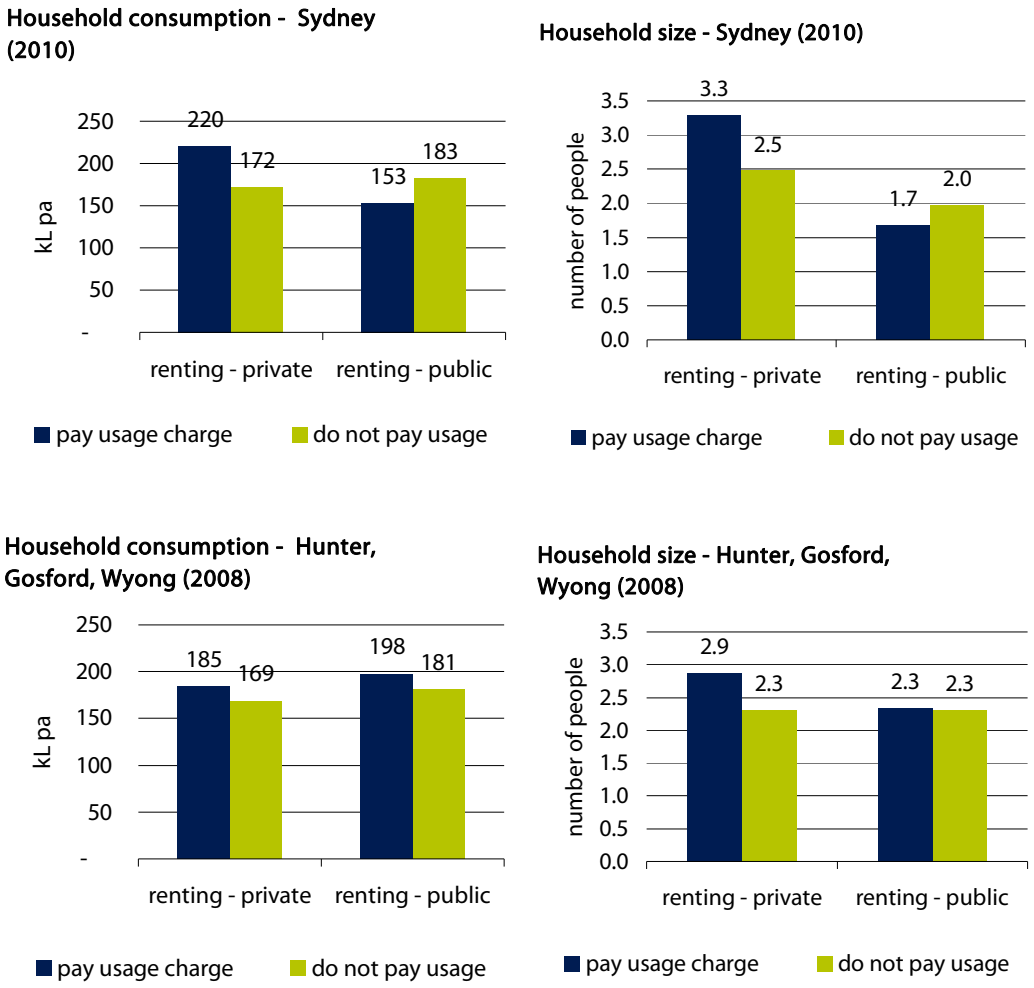
[60] Tenants do not pay the service charges directly to their water utility, and may pay the water usage charges if their consumption is individually metered. Whether or not a tenant pays the water usage charges directly to the water utility depends on the arrangement between the tenant and the owner.

usage charges on average used less water (153kL compared to 183kLof water per year) (Figure 6.9).

The main reason for the differences in household consumption is probably the differences in average household size, with higher consumption associated with more people per household. For example, tenants renting privately in Sydney in 2010 and paying usage charges (and using more water) had an average of 3.3 people per household, compared to 2.5 people for tenants renting privately and not paying these charges (and using less water) (Figure 6.9).

Our findings for the Hunter, Gosford and Wyong areas in 2008 are consistent with these findings for Sydney in 2010. They suggest that paying water usage charges does not have a strong impact on the amount of water a household uses.

Figure 6.9 Average consumption and household size by payment of water usage charges for tenants in public and private rental accommodation



Note: The information for households in public housing in the Hunter, Gosford and Wyong areas needs to be interpreted with caution due to a small sample size.

6.4 What do households use water for?

Households use water for a wide range of purposes. Some of these can be considered basic, or non-discretionary, in the sense that they are required for reasons of health, subsistence and hygiene. This includes drinking, bathing, cooking, cleaning, washing and toilet flushing. Discretionary usage includes consumption for non-essential purposes such as watering gardens, washing cars, cleaning driveways and filling swimming pools. It can also include consumption in excess of the amount necessary for health and hygiene, such as having long showers.

To better understand what water is used for, our surveys asked participants about large water using amenities such as swimming pools and spa baths, and appliances including dishwashers and washing machines. They also asked whether participants had dual flush or single flush toilets. The results for Sydney (2010) indicate that large water users have more water using amenities and appliances, and in particular are much more likely to have a dishwasher and a swimming pool than small users. They are also likely to use their dishwashers and washing machines more frequently and to water their gardens with sprinklers (Table 6.2).

These findings are consistent with our 2008 survey in the Hunter, Gosford and Wyong areas (shown in Table 6.2). They are also consistent with the 2006 survey in Sydney.

Table 6.2 Snapshot: Usage characteristics of small and large water users, Sydney (2010) and Hunter, Gosford, Wyong (2008)[a]

Small water users (less than 100 kL per annum)		Large water users (more than 400kL per annum)	
Have an average of 4.9 indoor water-using amenities and appliances[b]	*(4.5)*	Have an average of 7.3 indoor water-using amenities and appliances [b]	*(5.4)*
76% use a dishwater less than once a week or do not have one	*(81%)*	42% use a dishwater less than once a week or do not have one	*(44%)*
4% use one 6 times a week or more	*(4%)*	33% use one 6 times a week or more	*(37%)*
62% use a washing machine less than 3 times a week or do not have one	*(69%)*	19% use a washing machine less than 3 times a week or do not have one	*(13%)*
6% use a one 6 times a week or more	*(4%)*	44% use one 6 times a week or more	*(60%)*
4% have a swimming pool	*(4%)*	36% have a swimming pool	*(31%)*
2% use sprinklers to water their gardens	*(14%)*[c]	19% use sprinklers to water their gardens	*(50%)*[c]

a Values for Hunter, Gosford, Wyong (2008) are in brackets and *italics.*

b Amenities and appliances include toilets, showers, baths, spas, dishwashers and washing machines.

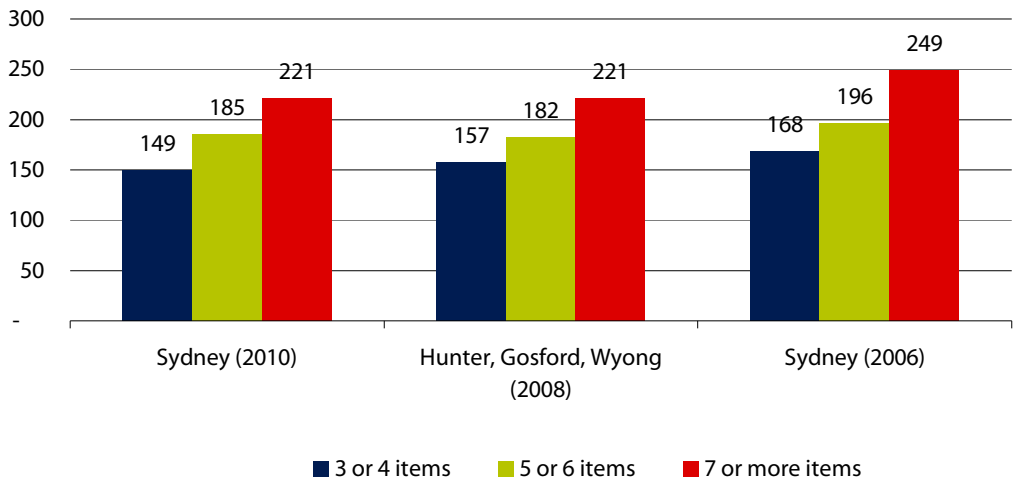
c Hunter area only. Garden watering with sprinklers was not permitted in Gosford or Wyong due to water restrictions.

The sections below discuss in more detail the relationship between consumption and the number of indoor amenities, dishwasher ownership, swimming pool ownership and garden watering, and the incidence of dual-flush toilets.

6.4.1 Relationship between the number of indoor amenities and appliances and water consumption

Households with a large number of water using amenities and appliances[61] consume more water than those with fewer of these amenities and appliances. For example, households in Sydney (2010) with more than 7 indoor water using amenities and appliances consumed 72kL (or 48%) more water than those with 3 or 4 amenities and appliances. A similar pattern was found in the 2008 survey in the Hunter, Gosford and Wyong areas and in the 2006 Sydney household survey (Figure 6.10).

Figure 6.10 Average consumption by number of indoor water using amenities[a], (kLpa)



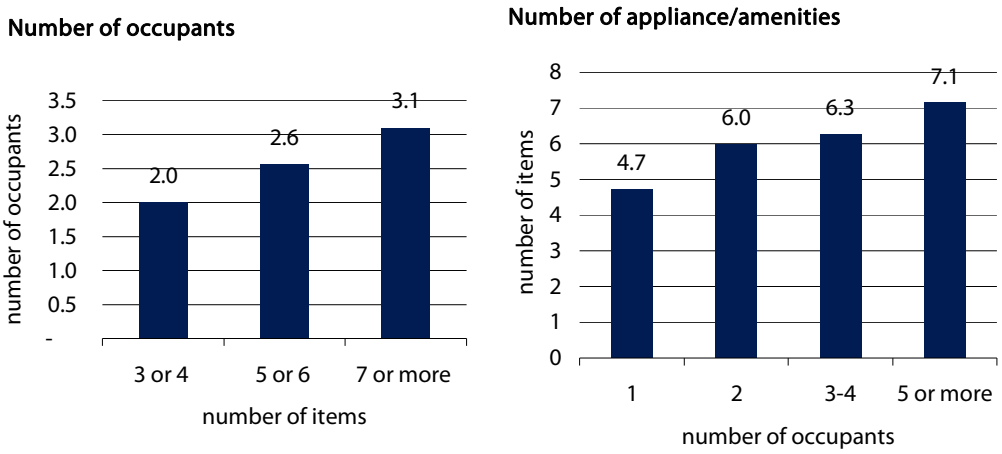
a Very few households have only 1 or2 amenities.

Note: Amenities and appliances include toilets, showers, baths, baths with spa jets, dishwashers and washing machines.

As expected, households with more indoor water using amenities and appliances (including toilets and showers) also on average have more occupants. Conversely, households with more occupants tend to have more indoor water using amenities and appliances (Figure 6.11). On average, high levels of consumption are therefore associated with households that have both a large number of occupants and a large number of water using items.

61 The indoor amenities and appliances included in the survey are toilets, showers, baths, baths with spa jets, dishwashers and washing machines.

Figure 6.11 Average number of occupants and number of indoor water using amenities, Sydney (2010)[a]



[a] Very few hou8seholds have only 1 or2 amenities.

Note: Amenities and appliances include toilets, showers, baths, baths with spa jets, dishwashers and washing machines.

6.4.2 Relationship between dishwasher ownership and frequency of use and water consumption

Dishwasher ownership is associated with higher water consumption. For example households in Sydney (2010) that have a dishwasher used on average 44kL (or 27%) more water than those without a dishwasher (Figure 6.12).

Households that use their dishwashers more frequently also have higher water consumption. For example, looking at households in Sydney (2010) that lived in free-standing houses, those used their dishwashers 6 or more times a week consumed 76kL (or 42%) more water than those using their dishwasher only once or twice a week. We found a similar pattern in the Hunter, Gosford and Wyong areas in 2008 (Figure 6.13).

However, as Chapter 4 noted in relation to air conditioners and dishwashers, these differences in consumption should not be interpreted as the incremental effect on average water consumption of installing or using a dishwasher. Other household characteristics (such as household size, the number of other appliances and garden watering behaviour) may influence whether a household has a dishwasher, uses it more frequently and consumes more water. In particular, households that use their dishwashers frequently are likely to have more occupants than infrequent users.

Figure 6.12 Average water consumption by dishwasher ownership (all households) (kL pa)

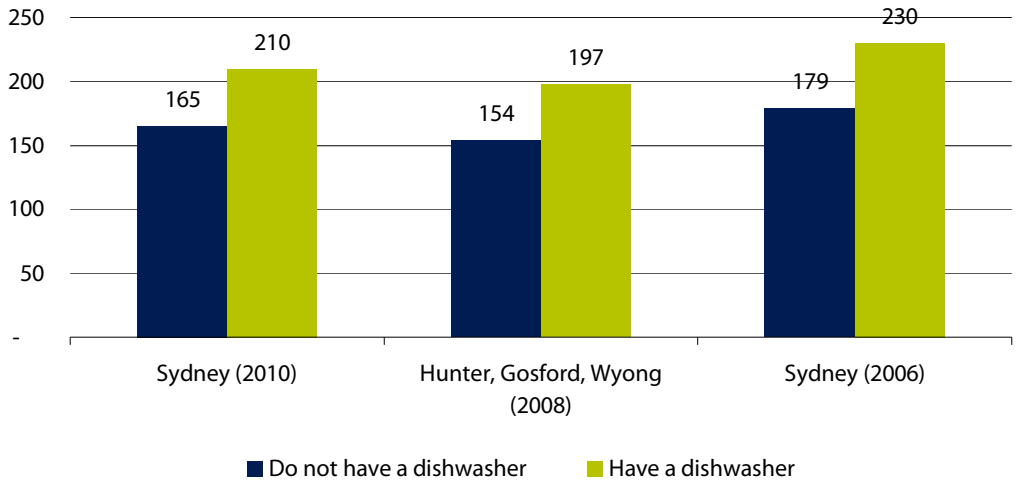
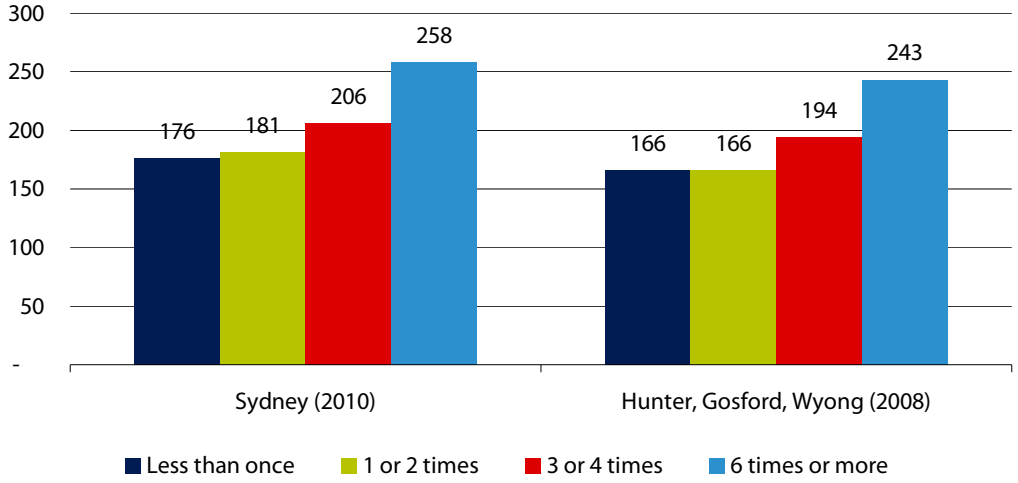


Figure 6.13 Average water consumption by frequency of dishwasher use (times per week, free-standing houses only) (kL pa)

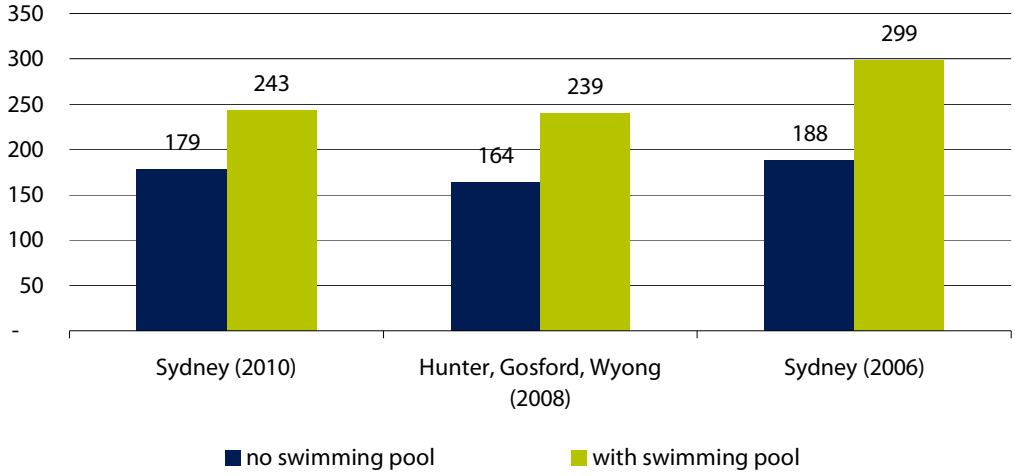


6.4.3 Relationship between swimming pool ownership and water consumption

Households with a swimming pool use more water than those without a swimming pool. For example, households with a swimming pool in Sydney (2010) used 64kL (or 36%) more water than those without a swimming pool. Our findings were similar in the Hunter, Gosford and Wyong areas in 2008 (Figure 6.14).

For Sydney, the difference in water consumption between households with and without a swimming pool was smaller in 2010 than in 2006 (Figure 6.14). In part, this is probably due to differences in sampling and weighting methods between the surveys (see Appendix A). However, another reason may be that more households with a swimming pool used rain water tanks in 2010 than they did in 2006, and therefore used less mains water. By 2010, 32% of households in free-standing houses with a swimming pool had a rain water tank.[62]

Figure 6.14 Average water consumption by swimming pool ownership (kL pa)



6.4.4 Relationship between garden watering and water consumption

Households in Sydney have been permitted to water their gardens on any day of the week between 4pm and 10am since June 2009, when restrictions were lifted and Water Wise rules were introduced (see Chapter 3). The Sydney (2010) survey asked respondents with gardens whether they watered their gardens, and if so how.

The 2008 survey asked respondents in the Hunter area the same questions. Households in Gosford and Wyong were not permitted to water their gardens with handheld hoses or to use sprinkler systems, because of water restrictions. Thus the survey only asked households in the Hunter area about garden watering methods.

62 The proportion of households with rainwater tanks probably increased fairly substantially between 2006 and 2010. Our 2006 survey did not ask respondents whether they had a rainwater tank, but information from Sydney Water indicated that less than 4% of households in free-standing houses had received a rebate for a rain water tank by 2006. By 2010, 26% of households in free-standing houses had a rain water tank. On the assumption that a significant proportion of households that install a rain water tanks apply for the rebate, this means that there was a significant increase in the number of rain water tanks in Sydney between 2006 and 2010.

The results of the survey in both areas reveal 3 key findings:[63]

- households that do not water their gardens use less water than households that do water their gardens
- households that use sprinkler systems use more water than households that use handheld hoses
- households that water their gardens use more water if they live on large blocks of land compared to households that live on small blocks of land.

For example, as Figure 6.15 shows, average water consumption in Sydney (2010) was highest for households on large blocks of land that used a sprinkler system (288kL) and lowest for households on small blocks of land that never watered their garden or use other methods (161kL).[64]

Comparing households in Sydney that live on medium-sized blocks of land (which is the most common size), households that used a sprinkler system used 43kL (or 21%) more than households that used a handheld hose, and 51kL (or 26%) more than households that never watered their garden or used other methods.[65]

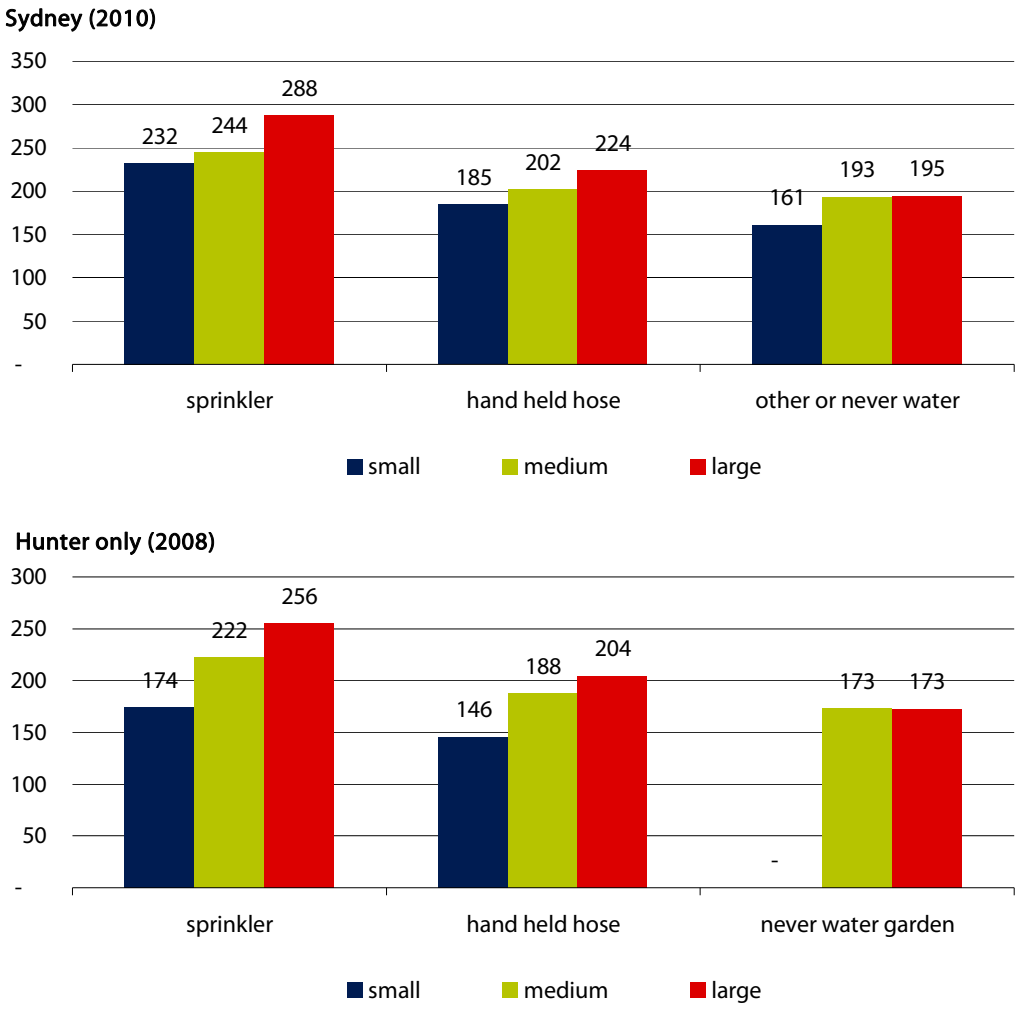
The findings in the Hunter area in 2008 were very similar to those for Sydney in 2010.

63 Only households that live in free-standing houses are included in this analysis.

64 The most commonly used other methods buckets and watering cans, and grey water or water from rain water tanks. A few also used drip irrigation methods.

65 Note that sprinkler systems were permitted only after the introduction of Water Wise Rule in June 2009. Since some of our water consumption data cover the period January to May 2009, these figures will not reflect the full effect on consumption of using a sprinkler system.

Figure 6.15 Average water consumption for free-standing houses with different garden watering methods and property sizes[a] (kL pa)



[a] Small means less than 500m^2, medium means 500m^2 to 900m^2 and large means greater than 900m^2. Free-standing houses only.

Note: For the Hunter area, average consumption for households on small properties that never water the garden is not shown due to the small sample size.

Again, these increases in consumption should not be interpreted as the incremental effect on average water consumption of garden watering. Other factors, such as household size, frequency of appliance use and swimming pool ownership, are likely to play a role in the average consumption of the different households.

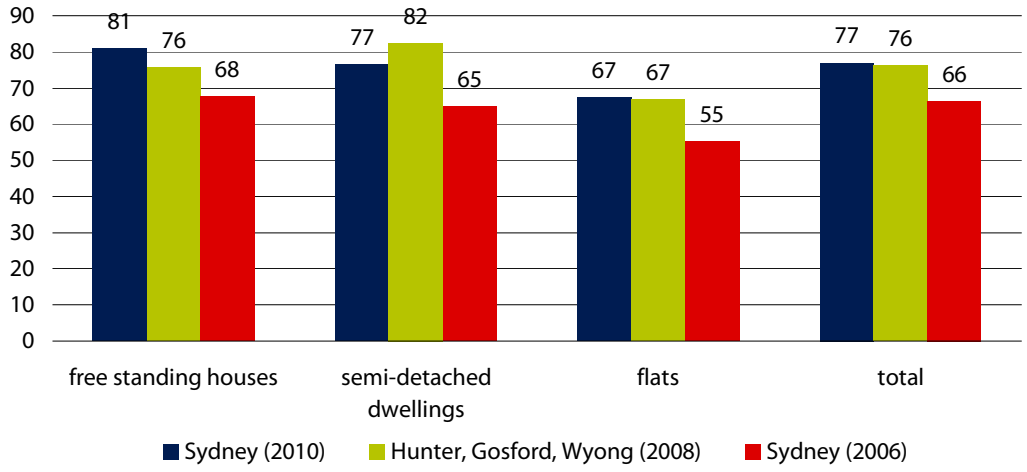
6.4.5 How common are dual flush toilets?

For a number of years, Sydney Water and the NSW Government have adopted various strategies to encourage households to replace single flush toilets with dual flush toilets (see Box 3.2 and Box 3.4). In addition, the NSW Government's Building

Sustainability Index (BASIX) program, introduced in 2004, encourages the use of dual flush toilets in new and renovated dwellings.[66]

Our survey findings suggest that the proportion of toilets in Sydney that are dual flush has increased over the past 4 years, from 66% in 2006 to 77% in 2010. The proportion of toilets that are dual flush in the Hunter, Gosford and Wyong areas was similar to the proportion in Sydney in 2010 (76%). We also found that flats are less likely to have dual flush toilets than free-standing houses or semi-detached dwellings (Figure 6.16).

Figure 6.16 Proportion of toilets that are dual flush (%)



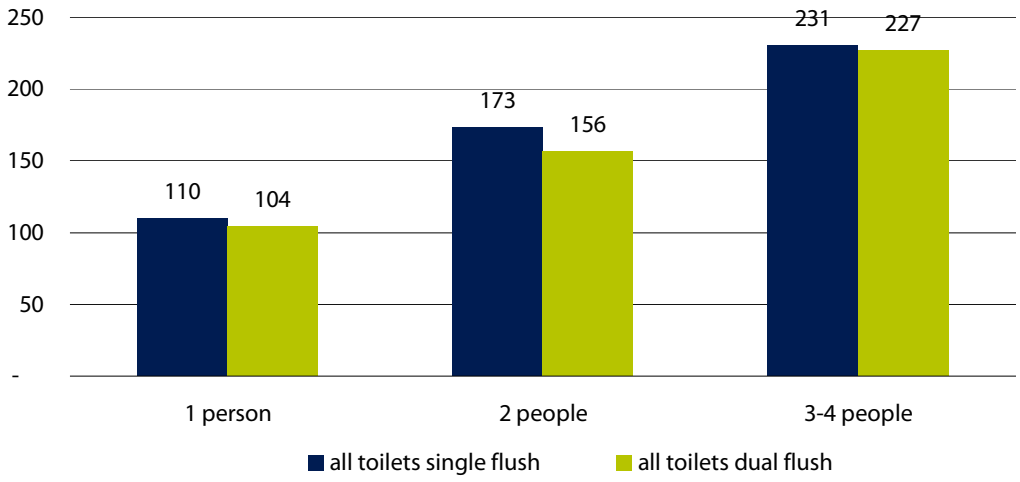
To investigate the relationship between water consumption and dual flush toilets, we looked at the average consumption of households that live in free-standing houses and that have 1, 2 or 3 to 4 occupants respectively. We then compared the consumption of households that had only single flush toilets with those that had only dual flush toilets.[67] We found that households with only dual flush toilets consumed only slightly less than those with only single flush toilets (Figure 6.17).

This does not mean that dual flush toilets have very little impact on water consumption. Other factors, such as garden watering behaviour and swimming pool ownership, are likely to play a role in the average consumption of the different households.

66 NSW Government website at http://www.basix.nsw.gov.au/information/about.jsp. Also see http://experts.realestate.com.au/renovating-building/build-changing-sustainable-housing-laws-around-australia and http://about.nsw.gov.au/collections/doc/duoset-dual-flush-toilet-cistern/

67 Some households have both single and dual flush toilets.

Figure 6.17 Average consumption of households in free-standing houses with only single flush toilets or only dual flush toilets, by number of occupants (Sydney 2010) (kL per year)



6.5 Alternatives to mains water: bore water, grey water and rainwater tanks

Sydney Water and the Gosford and Wyong Councils have introduced a number of strategies to reduce mains water usage, including education campaigns, media coverage of water shortages and incentives to use water saving technologies. In addition, the NSW Government and the Commonwealth Government have introduced a number of schemes to encourage the use of grey water and water from rain water tanks.

In order to shed some light on the success of these strategies, the 2010 survey in Sydney and the 2008 survey in the Hunter, Gosford and Wyong areas included questions about households' use of alternative sources of water, namely bore water, grey water and water from rainwater tanks.

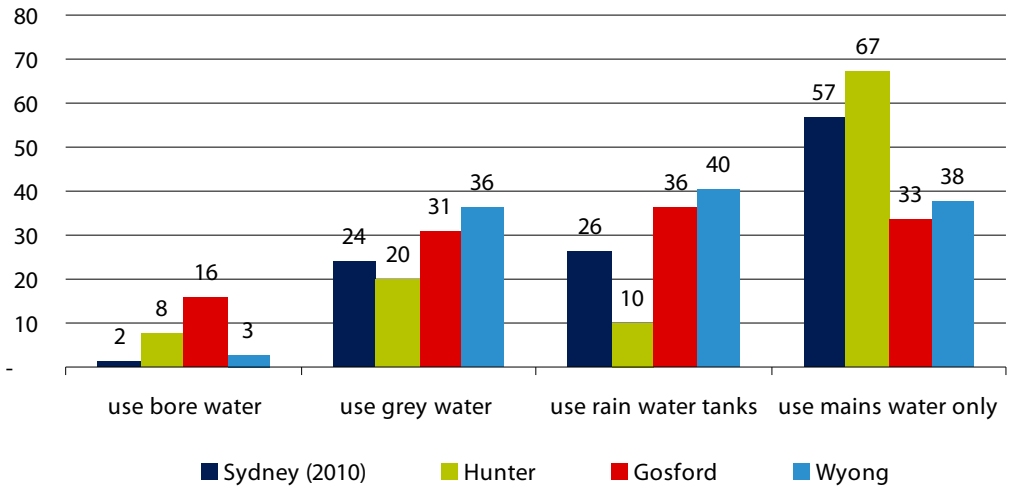
6.5.1 How many households use alternative sources of water, and what for?

The likelihood of households using alternative sources of water to mains water seems to be associated with whether or not the area in which they live faces water shortages and therefore has water restrictions and other measures in place to reduce the use of mains water. Comparing the results of the 2008 and 2010 surveys, we found that the proportion of households in free-standing houses that used grey water and/or water from rainwater tanks was smaller in Sydney than in Gosford or Wyong (where there were severe water shortages and strict water restrictions). But households in Sydney were more likely to use these alternative sources of water than households the Hunter area (which did not face any water shortages and therefore

had no water restrictions in place).[68] Similarly, more than half of households in free-standing houses in Sydney relied on mains water only, compared to around a third in Gosford and Wyong, and around two-thirds in the Hunter area (Figure 6.18).

Very few households in Sydney used bore water (2%). A far higher proportion used water from this source in Gosford (16%) and the Hunter area (8%) (Figure 6.18).

Figure 6.18 Households that use bore water, grey water or rainwater tanks (free-standing houses only) (%)



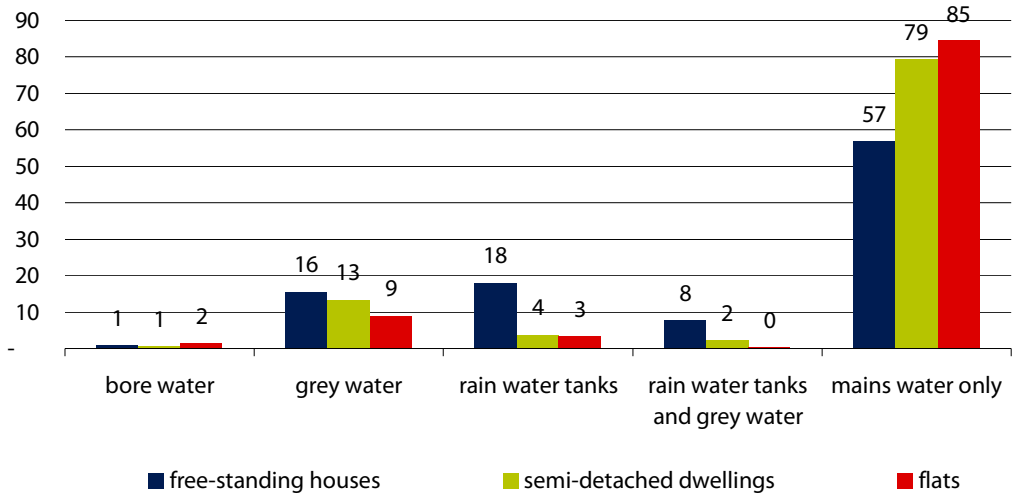
Note: Numbers will not add to 100 because many households use more than one alternative source of water.

Looking more closely at Sydney in 2010, we found that households in free-standing houses were more likely to use grey water and/or water from rainwater tanks than households in either semi-detached dwellings or flats. As a consequence, while 57% of households in free-standing houses used only mains water, a higher proportion of households in semi-detached dwelling used only mains water (79%) and an even higher proportion of households in flats used only mains water (85%). The main alternative source of water for households in semi-detached dwellings or flats was grey water (Figure 6.19).

Most households use grey water or water from rainwater tanks outside only. For example, 89% of households in Sydney (2010) that used grey water used it only outside and 84% of households that used water from a rainwater tank used it only outside. We found a similar pattern of use in the Hunter, Gosford and Wyong areas in 2008.

[68] Sydney has a much higher proportion of flats and semi-detached dwellings than the Hunter, Gosford and Wyong areas (see Chapter 2), and it would be misleading to compare the areas including all dwelling types.

Figure 6.19 Proportion of households that use bore water, grey water and/or rainwater tanks by type of dwelling, Sydney (2010) (%)



Note: Numbers may not add to 100 due to rounding.

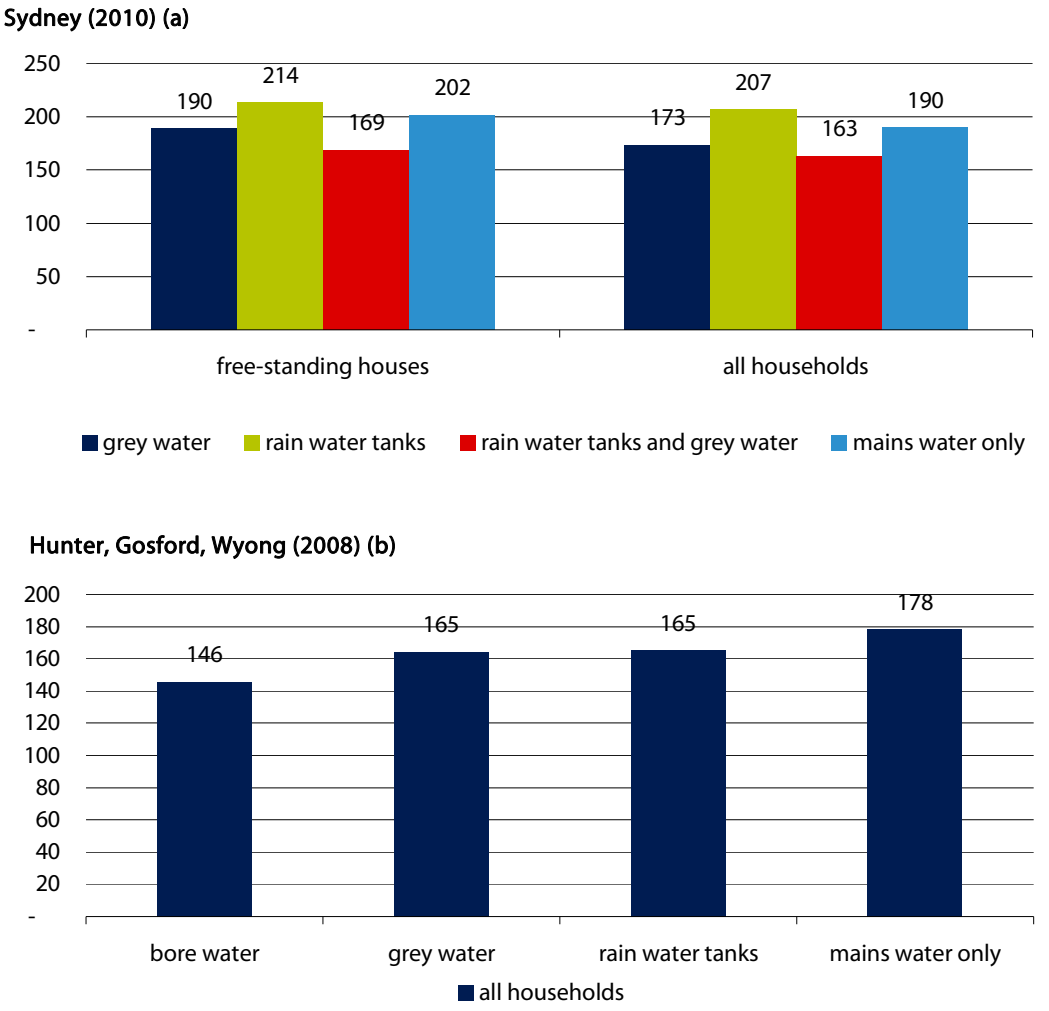
6.5.2 Relationship between consumption of mains water and alternative sources of water

Our 2010 Sydney survey found that, on average, households that used grey water as an alternative water source used less mains water than those that only used mains water. For example, of households in free-standing houses, those using grey water used 13kL per year (or 6%) less mains water than those using mains water only. Those that using both grey water and rainwater tanks used 34kL per year (or 17%) less than those using mains water only.

However, households using water from rainwater tanks as their only alternative source of water on average used *more* mains water than those using only mains water. The reason for this is probably because of other characteristics associated with these households, such has having more occupants, living on a larger block of land (and therefore having a larger garden) and having a swimming pool.

In contrast, our 2008 Hunter, Gosford and Wyong survey found that households using only mains water on average consumed more than households that used either grey water or water from rain water tanks (Figure 6.20).

Figure 6.20 Average mains water consumption by households with and without alternative sources of water (kL pa)



a Bore water is not shown for Sydney due to the small number of observations.

b Consumption is shown for all households. Almost 90% of households in the Hunter, Gosford and Wyong areas lived in free- standing houses.

Note that these differences in consumption cannot be interpreted as the 'savings' in mains water due to the use of the alternative water sources. To estimate such savings, one would need to take a large number of other factors into account such as household size, income and land size. For example, as previously suggested, households that use rain water tanks might have higher incomes, more occupants, live on larger blocks of land and be more likely to have a swimming pool than average. The mains water savings from installing a rainwater tank would need to be calculated by comparing the water usage of these households before and after installation, or with reference to other households with similar characteristics.

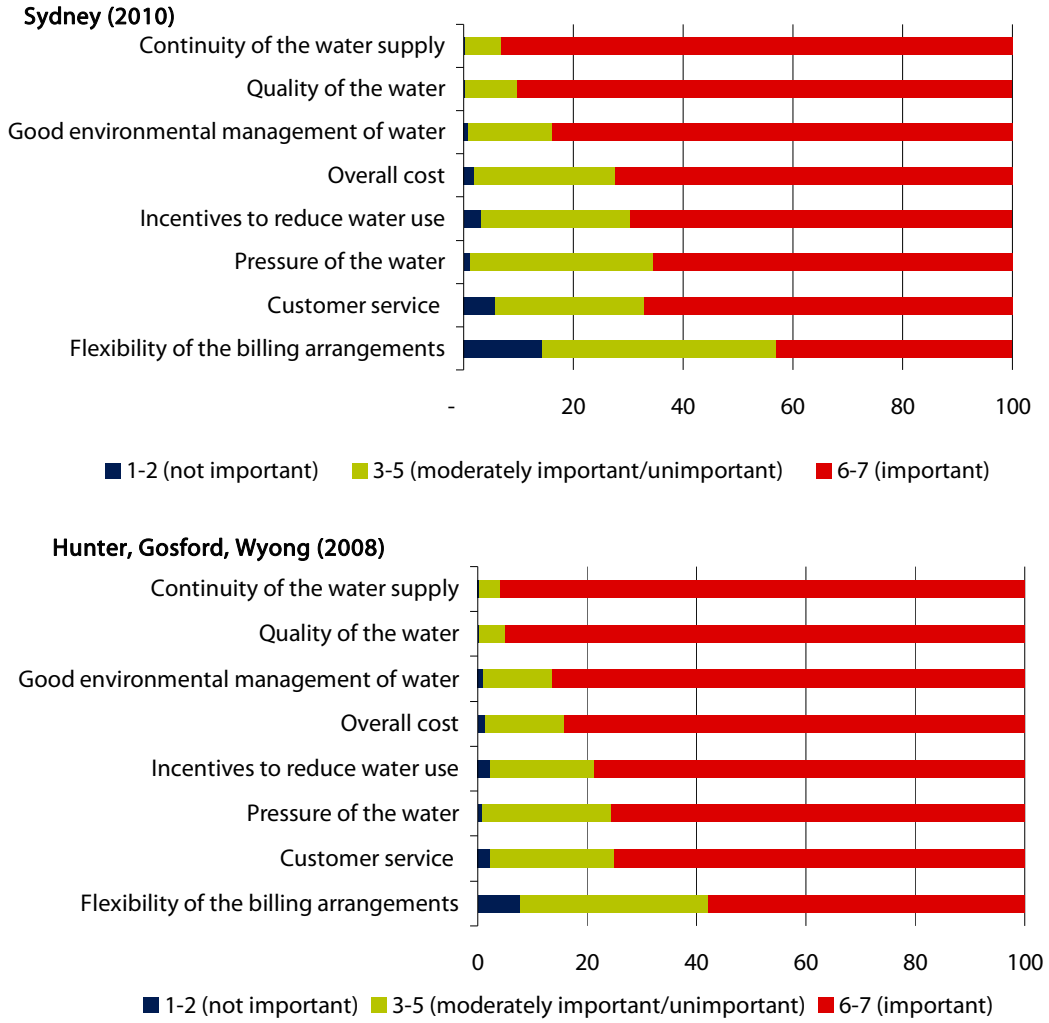
6.6 What is important to water customers?

To help understand what customers most want from their water supply service, our 2010 and 2008 surveys asked respondents to rate the importance of 8 attributes of a water supply service, on a scale of 1 to 7. In both the Sydney and Hunter, Gosford and Wyong areas:

- virtually all respondents rated the 'continuity of the water supply' and 'quality of the water' as important or very important (score 6 or 7)
- around 85% rated 'good environmental management of water' as important or very important
- more than 70% rated 'overall cost' as important or very important
- more than 65% indicated that 'incentives to reduce water use', 'pressure of the water' and 'customer service' were important or very important to them
- 'flexibility of the billing arrangements' was rated the least important (Figure 6.21).

Comparing the 2 areas, a higher proportion of households in the Hunter, Gosford and Wyong areas rated 'overall cost', 'customer billing' and 'flexibility of billing arrangements' as important or very important. This probably reflects the lower average incomes in these areas compared to Sydney (see Chapter 3), and the greater financial difficulty respondents had experienced paying utility bills. Payment difficulties are discussed in Chapter 8.

Figure 6.21 Proportion of households rating water service attributes as important or not important



For households in Sydney, the relative importance of some attributes changed between 2006 and 2010, mainly reflecting environmental concerns. In particular, 'good environmental management of water' was ranked 3rd most important in 2010, up from 4th most important in 2006.[69] Also, 'incentives to reduce water use' was ranked 5th in 2010, up from 7th in 2006. The 'continuity of water supply' replaced 'quality of water' as the most important attribute, which may also reflect an increasing concern for the environment by households that interpreted this attribute to mean ensuring the long-term availability of water[70] (Table 6.3).

69 The 2006 survey asked respondents to rank the 8 attributes from most important to least important, rather than to rate the importance of each attribute on a scale of 1 to 7. The responses to the 2006 and 2008 surveys were ranked by comparing the average scores.

70 The other interpretation of this attribute is a continuous water supply in the short term, without interruptions for example due to maintenance or burst water mains.

Table 6.3 Ranking of water service attributes by degree of importance

Rank	Sydney (2010)	Sydney (2006)
1	Continuity of the water supply	Quality of the water
2	Quality of the water	Continuity of the water supply
3	Good environmental management of water	Overall cost
4	Overall cost	Good environmental management of water
5	Incentives to reduce water use	Pressure of the water
6	Pressure of the water	Customer service
7	Customer service	Incentives to reduce water use
8	Flexibility of the billing arrangements	Flexibility of the billing arrangements

Finally, respondents were asked whether they think Sydney Water's services represent value for money. Just over two-thirds (67%) of respondents answered 'yes' to this question, 20% answered 'no' and 13% were unsure.

7 Income and consumption

A household's income can influence its consumption of electricity, gas and water, as well as its ability to pay for these services. To investigate the relationship between income and consumption we explored the characteristics of high- and low-income households, and investigated whether high-income households consumed more energy and water than low-income households. Chapter 2 explains what we mean by 'high-come' and 'low-income' households (see Table 2.1).

As Chapter 8 will discuss in more detail, we found that on average households that have paid off their homes experienced less financial difficulty paying energy bills than both renters and households that are still paying off their homes. To see whether renters and people paying off their homes used more energy and water, and therefore faced higher bills, we investigated the relationship between consumption and home-ownership status.

Concession card holders are mainly from low-income households and therefore may be vulnerable to increases in utility prices. To better understand this vulnerability, we explored the characteristics and consumption levels of households that hold a concession card. We also compared these characteristics with those of low-income households that do not hold a concession card to further understand households' vulnerability to utility price increases.

Again, we compared the outcomes of the 2010 Sydney survey with those of the 2008 Hunter, Gosford and Wyong survey and, where possible, with the 2006 Sydney survey.

We found that:

- Compared to high-income households, low-income households on average had fewer occupants; were more likely to be renting their homes; were less likely to be living in free-standing houses; and were less likely to own appliances and amenities such as clothes dryers, dishwashers, second refrigerators and swimming pools.
- Households with lower incomes generally consumed less electricity, gas and water than those with higher incomes. However, there were both large and small users within each income category.

- Households paying off their homes on average had more occupants and used more electricity, gas and water than either renters or households that had fully paid off their homes.
- Renters, who mainly live in flats, used less energy (but similar amounts of water) compared to households that had fully paid off their homes.
- Households that held a concession card on average consumed less energy and water than households that did not hold a concession card.
- Households that hold a concession card qualify for rebates on energy and water bills. In both survey areas, most households that held a concession card were aware of the rebates and claimed them. Nevertheless, a significant proportion of qualifying households in Sydney (2010) did not claim rebates (more than 20%).
- Low-income households that do not hold a concession card constitute only a small proportion of total households (around 5% in both survey areas). But these households may be even more vulnerable to utility price increases than low-income households that do hold a concession card.

These findings are discussed in more detail below.

7.1 Incomes in Sydney and the Hunter, Gosford and Wyong areas

As Chapter 3 discussed, on average, households in Sydney have higher incomes than those in the Hunter, Gosford and Wyong areas. Based on 2006 Census data,[71] the median household income in Sydney was $1,128 per week, while the median household income in the in the Hunter, Gosford and Wyong areas it was $877 per week.

7.2 Characteristics of households with low and high levels of income

We compared the characteristics of high- and low-income households in Sydney (2010) and the Hunter, Gosford and Wyong areas (2008), and found that in both areas they differ in a number of respects. Table 7.1 summarises these characteristics for Sydney and the Hunter, Gosford and Wyong areas (the latter in brackets and *italics*). Chapter 2 describes how identified income groups.

In Sydney (2010), we found that a higher proportion of low-income households were 1 person households (48% compared to 6%) or single parent households (13% compared to 5%). Conversely, fewer low-income households were couples with children (11% compared to 60%). As a consequence, low-income households were on average smaller than high-income households (1.9 people per households compared to 3.3 people per household). The findings were similar for the Hunter, Gosford and Wyong areas.

71 ABS, 2006 Census QuickStats, for Hunter (Commonwealth Electoral Division), Gosford-Wyong (Statistical Subdivision), Illawarra (Statistical Division), Sydney (Statistical Division).

Table 7.1 Characteristics for households with low and high incomes, Sydney (2010) and the Hunter, Gosford and Wyong areas (2008)[a]

Low household income (less than $33,800 per year)[b]		High household income (more than $130,000 per year)[c]	
48% are 1 person households	*(39%)*	6% are 1 person households	*(5%)*
13% are single parent households	*(10%)*	5% are single parent households	*(3%)*
11% are couples with children	*(13%)*	60% are couples with children	*(72%)*
1.9 people per household	*(1.9)*	3.3 people per household	*(3.5)*
54% live in free-standing houses	*(83%)*	66% live in free-standing houses	*(96%)*
31% live in flats	*(3%)*	22% live in flats	*(1%)*
60% have paid off their home	*(72%)*	50% have paid off their home	*(46%)*
5% are paying off their home	*(5%)*	41% are paying off their home	*(48%)*
33% rent their home (private or public)	*(23%)*	9% rent their home (private or public)	*(6%)*
78% have a concession card	*(86%)*	3% have a concession card	*(2%)*
38% have mains gas	*(23%)*	61% have mains gas	*(41%)*
52% have a clothes dryer and	*(61%)*	81% have a clothes dryer and	*(88%)*
18% use one at least once per week	(*17%)*	42% use one at least once per week	(*48%)*
26% have a dishwasher and	(*29%)*	80% have a dishwasher and	(*78%)*
11% use one 3 times per week or more	(*11%)*	60% use one 3 times per week or more	(*62%)*
54% have air conditioning,	*(68%)*	64% have air conditioning,	*(75%)*
38% use air conditioning at least once a week in summer, and	*(40%)*	49% use air conditioning at least once a week in summer, and	*(50%)*
23% use air conditioning at least once a week in winter	*(36%)*	39% use air conditioning at least once a week in winter	*(43%)*
37% have a second refrigerator	*(43%)*	54% have a second refrigerator	*(66%)*
7% have a swimming pool	*(6%)*	28% have a swimming pool	*(30%)*

a Values for Hunter, Gosford, Wyong (2008) are in brackets and *italics*.

b For Hunter, Gosford, Wyong (2008), less than $31,200 per year (see Table 2.1).

c For Hunter, Gosford, Wyong (2008), more than $104,200 per year (see Table 2.1).

Low-income households in both areas were more likely to be renting their homes than high-income households. However, the majority of low-income households had paid off their homes (60% in Sydney and 72% in the Hunter, Gosford and Wyong areas). We discuss the relationship between home ownership, vulnerability to utility price increases and payment difficulties in Chapter 8.

In both areas, low-income households were less likely to be living in free-standing houses, than high-income households, and more likely to be living in flats (in

Sydney) or other multi-dwelling units. They were also less likely to own and use items such as clothes dryers, dishwashers, second refrigerators and swimming pools.

Only 3% of high-income households in Sydney had a concession card, compared to 78% of low-income households. Concession cards are discussed in section 7.5 below.

7.3 Relationship between household income and consumption

We analysed the survey data to understand how household consumption of electricity, gas and water varies with household income. To do this we looked at both average consumption for the different income groups, and the distribution of consumption for low-income households and high-income households.

7.3.1 High-income households on average use more energy and water than low-income households

We found that higher income households in Sydney (2010) generally consume more electricity, gas and water than lower income households. This finding is consistent the findings for the Hunter, Gosford and Wyong areas (2008) and the 2006 Sydney survey (Figure 7.1).[72]

However, there appears to be a stronger relationship between electricity consumption and income than there is for water and gas consumption. On average, high-income households consume:

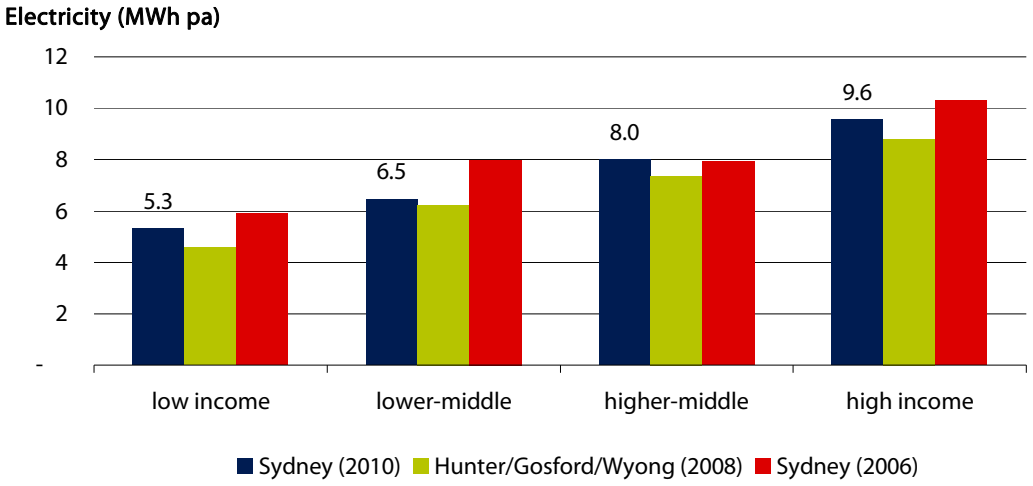
- 4.2 MWh (or 80%) more electricity per year than low-income households
- 9.3 GJ (or 63%) more gas per year than low-income households
- 95 kL (or 65%) more water per year than low-income households.

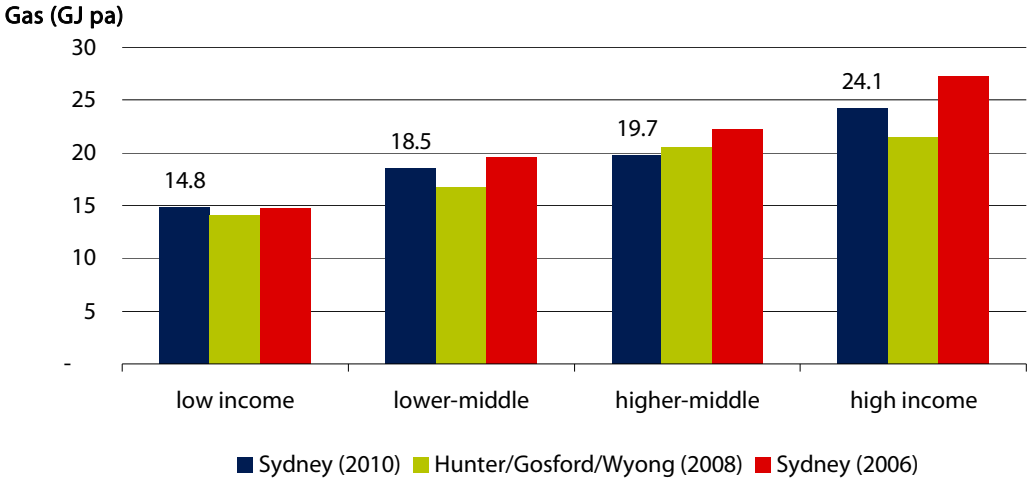
We found a similar pattern in the Hunter, Gosford and Wyong areas in 2008 and in Sydney in 2006.[73]

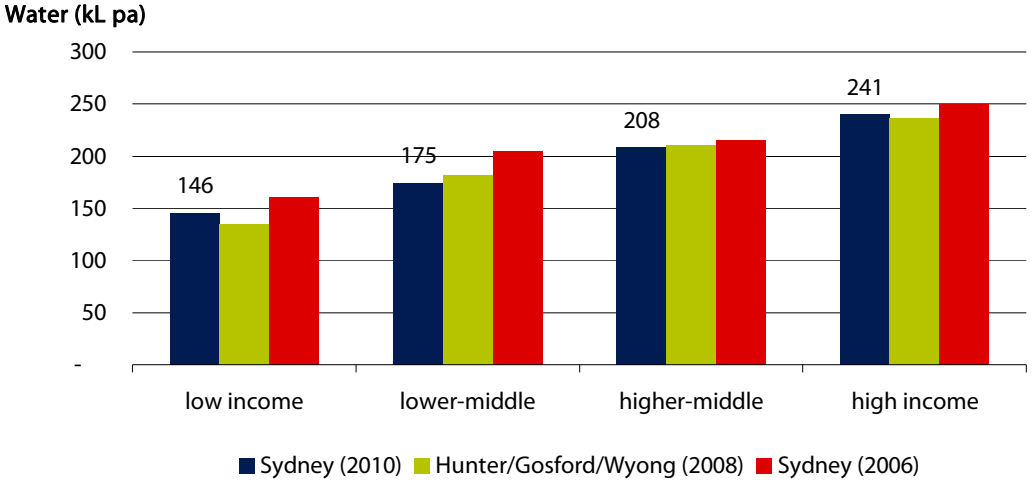
[72] The *levels* of consumption are not strictly comparable between the 2006 and 2010 Sydney surveys because the surveys used different sampling methodologies and different methods and to weight the data (see Appendix A). Caution is required when comparing levels of consumption because this could lead to invalid conclusions regarding trends between 2006 and 2010.

[73] The 2006 survey in Sydney found that gas consumption was the most sensitive to income. The reasons for this are unclear, and might be partly due to differences in the weights applied to the data. The weights are discussed in Appendix A.

Figure 7.1 Average annual consumption of electricity, gas and water by income group







7.3.2 There is a wide range of consumption within each income group

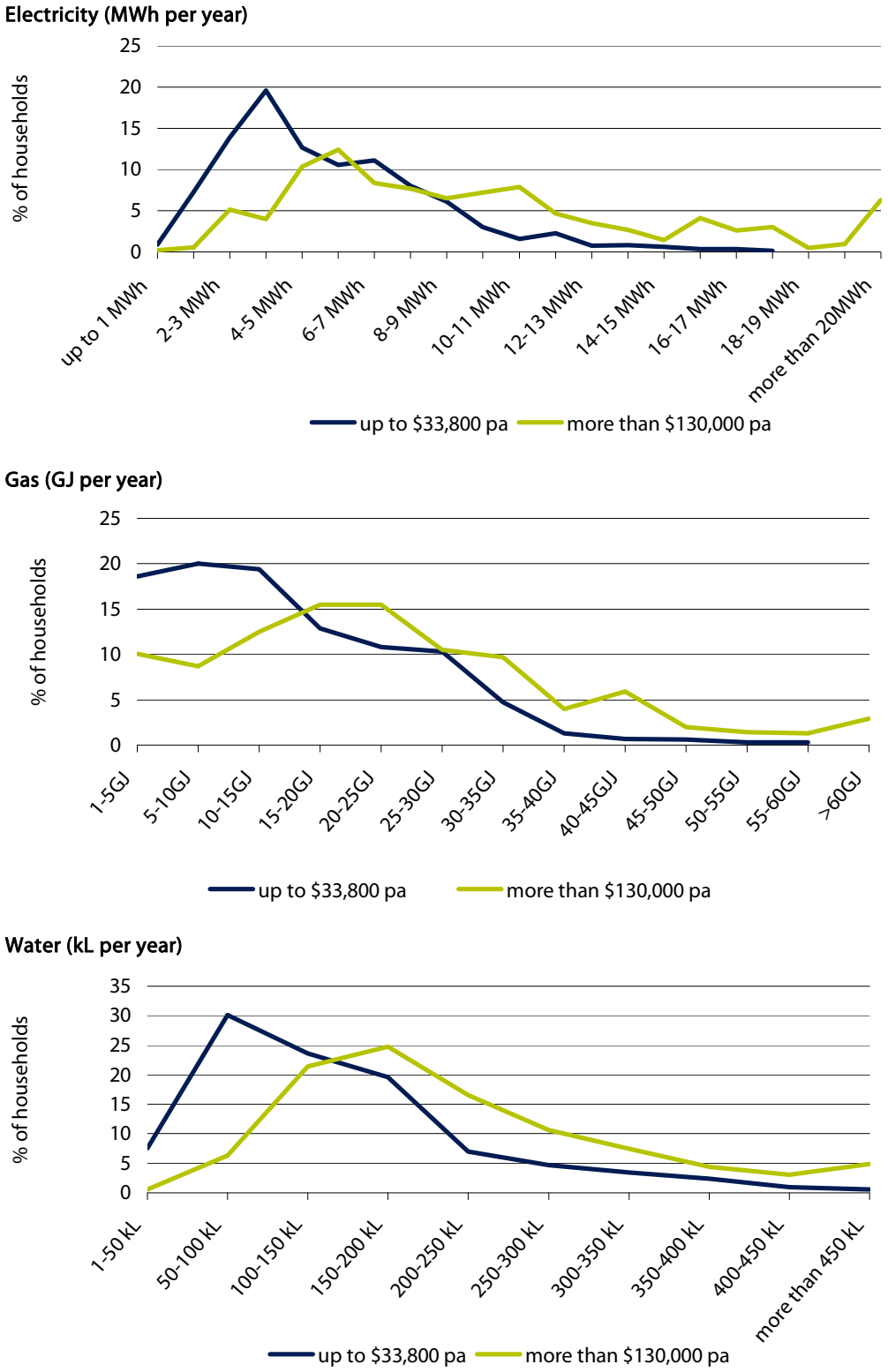
The previous chapters on energy and water consumption discussed a number of characteristics that are associated with high usage (see Chapters 4, 5 and 6). High-income households tend to be associated with high usage characteristics more frequently than low-income households. For example, compared to low-income households, high-income households are more likely to:

- be larger (ie, have more occupants)
- live in free-standing houses rather than flats or units
- more frequently use appliances such as clothes dryers, dishwashers and a 2nd refrigerator
- more frequently use air conditioners for space heating and cooling
- have a swimming pool (see Table 7.1).

However, some low-income households also display characteristics associated with high usage while some high-income households display few such characteristics. As a consequence, there are both large and small users within each income category. This is demonstrated in Figure 7.2, which shows the percentage of households within each consumption band, for low-income households and high-income households.

Similar patterns were evident in the Hunter, Gosford and Wyong areas in 2008 and in Sydney in 2006.

Figure 7.2 Frequency distribution of electricity, gas and water consumption by consumption band, for low income and high-income households, Sydney (2010) (%)



7.4 Relationship between consumption and home-ownership status

As Chapter 8 will discuss, we found that households that have paid off their homes on average experience less financial difficulty paying utility bills than both renters and households that are still paying off their homes. There are several possible reasons for this, including that:

- renters are more likely to have lower incomes
- both renters and households paying off their homes have higher accommodation costs
- renters and/or households paying off their homes use more energy or water and therefore have higher bills.

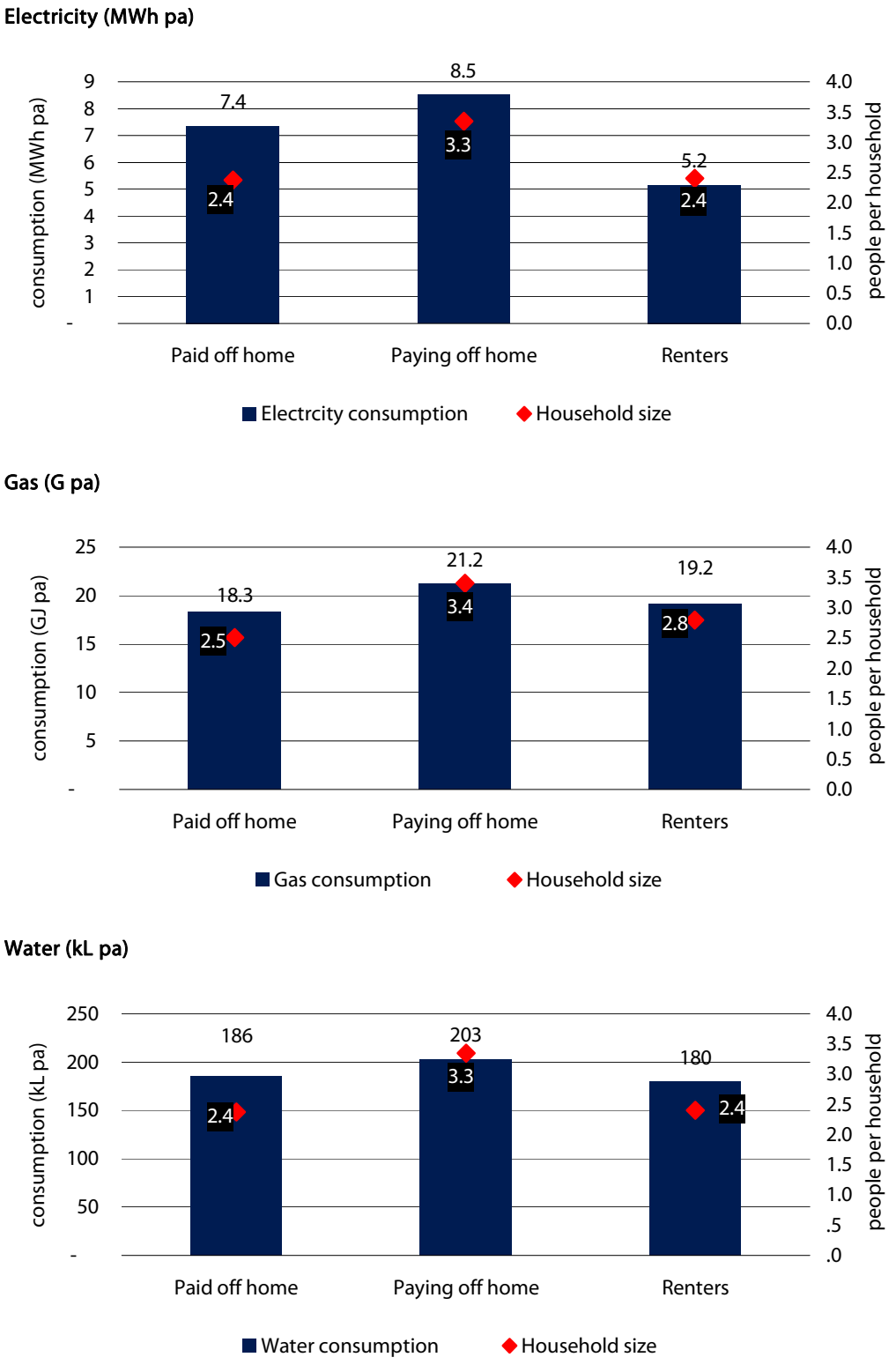
To determine whether there is any association between home ownership and consumption, we analysed the differences in average household consumption of electricity, gas and water by home-ownership status.

We found that households paying off their homes on average used more electricity, gas and water than either renters or households that had fully paid off their homes. One reason for this is that households paying off their homes were on average larger than either renters or households that had fully paid off their homes (3.3 people compared to 2.4 people per household (Figure 7.3).

Comparing households that rent with those that had fully paid off their homes, (each with 2.4 people per household), we found that renters used about 30% less electricity (but similar amounts of gas and water)[74] than homeowners (Figure 7.3).

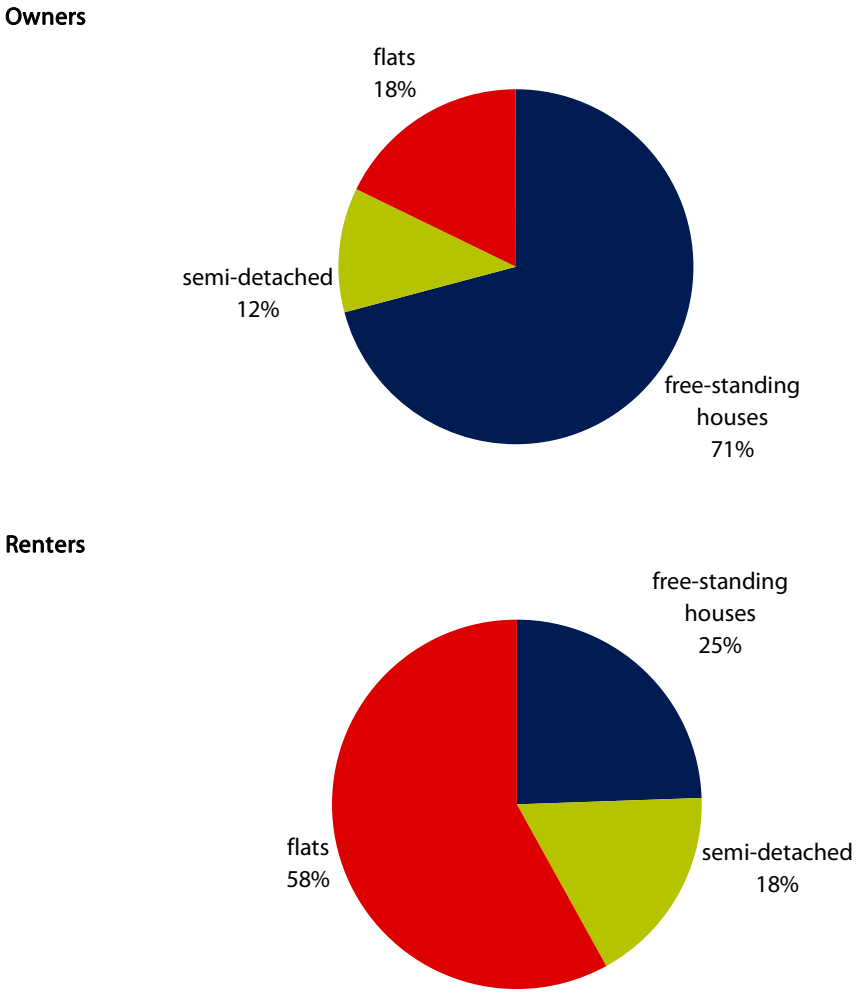
74 Renters used 5% more gas and 3% less water than households that had paid off their homes.

Figure 7.3 Average household size and annual consumption of electricity, gas and water by home ownership status, Sydney (2010)



One of the reasons for renters' lower energy (ie, combined electricity and gas) consumption may be that they are far more likely to live in flats than free-standing houses compared to homeowners (Figure 7.4).[75] As Chapter 4 noted, the average electricity consumption of households that live in flats is lower than that of households in free-standing houses, possibly because these dwellings need less space heating and cooling.

Figure 7.4 Dwelling type by home ownership status, Sydney (2010)



Note: Totals may not add to 100% due to rounding.

[75] There is very little difference in dwelling type between owners who have paid off their homes and those who are paying off their homes.

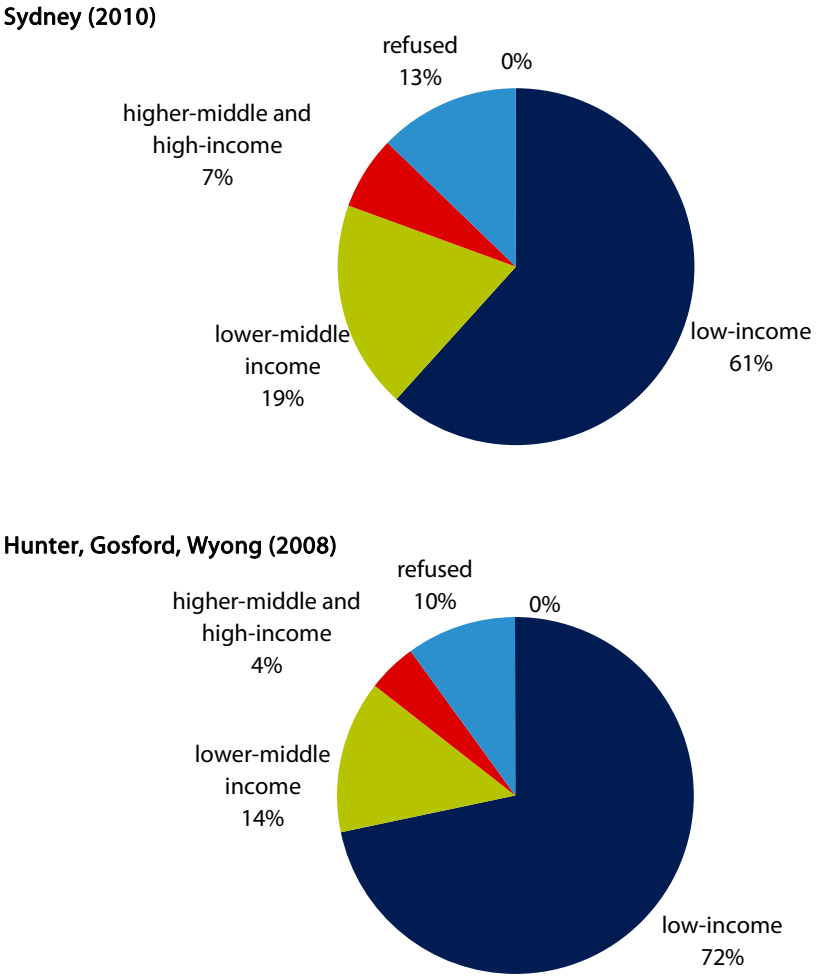
7.5 Relationship between income, consumption and concession card status

Concession card holders are mainly from low-income households and therefore may be vulnerable to increases in utility prices. To better understand this vulnerability, we explored the characteristics and consumption levels of households that held a concession card.

7.5.1 Concession card holders come from lower income households

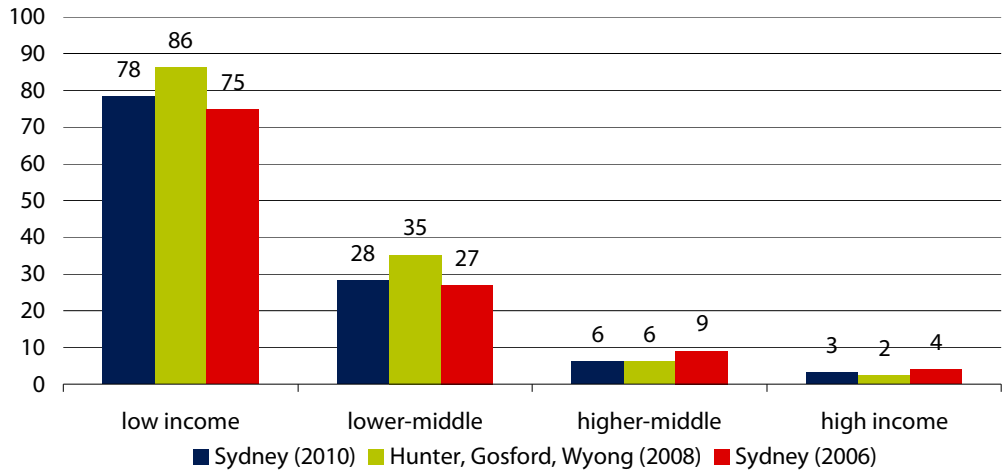
In Sydney (2010) we found that at least 61% of households with a concession card were in the lowest income group and a further 19% were in the lower-middle income group. The actual proportions might be slightly higher because 13% of households that held a concession card refused to provide income information. More than 70% of households that held a concession card in the Hunter, Gosford and Wyong areas were in the lowest income group (Figure 7.5).

Figure 7.5 Proportion of concession card holders that fall within each income group (%)



We also investigated what proportion of households in each income group held a concession card. In Sydney (2010), 78% of households in the low-income group held a concession card, while 28% of households in the lower-middle income group similarly held a concession card. In contrast, only 3% of households in the high-income group held a concession card. Our previous surveys found similar results, although in the Hunter, Gosford and Wyong areas a slightly higher proportion of households in the lower income groups held a concession card (Figure 7.6).

Figure 7.6 Proportion of households in each income group that held a concession card (%)



7.5.2 Households that hold a concession card tend to consume less energy and water

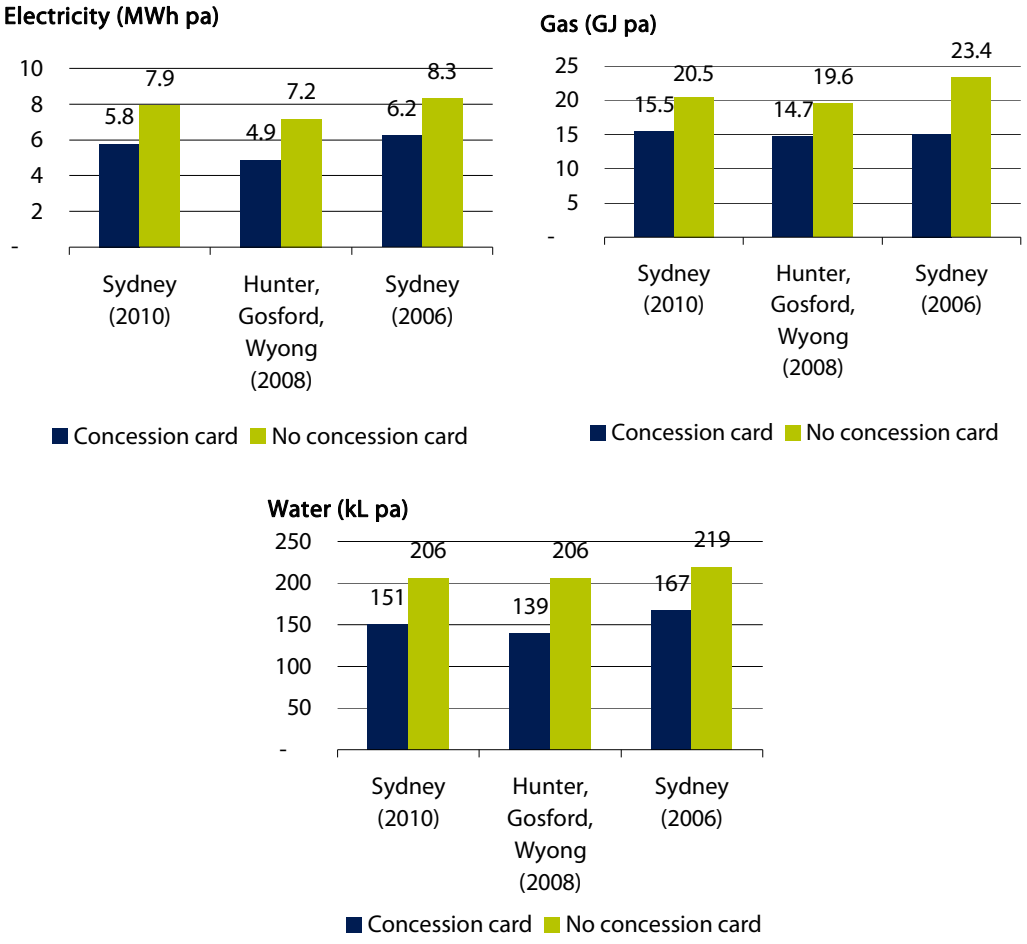
We found that households with a concession card consumed less than households without a concession card (Figure 7.7). On average, Sydney (2010) households without a concession card (including all income groups) consumed:

- 2.2kWh (or 37%) more electricity annually than households with a concession card
- 5.0 GJ (or 33%) more gas annually than households with a concession card
- 55 kL (or 37%) more water annually than households with a concession card.

Again, the results were similar for the 2008 Hunter, Gosford and Wyong survey and the 2006 Sydney survey (Figure 7.7).

In both survey areas, this low consumption appears to be partly a consequence of the smaller household size. For example, in Sydney (2010) households that held a concession card had an average of 1.9 occupants, compared to 2.9 occupants in households that did not hold a concession card (average for all income groups). It may also be because households with a concession card are less likely to own and/or use appliances such as clothes dryers and dishwashers. For example, in Sydney (2010) only 23% of households that held a concession card used a dishwasher more than once a week, compared to 51% of other households. Similarly, 17% of households that held a concession card used a clothes dryer more than once a week, compared to 31% of other households.

Figure 7.7 Average consumption of electricity, gas and water by concession card status



Note: The levels of consumption are not strictly comparable between the 2006 and 2010 Sydney surveys because the surveys used different sampling methodologies and different methods and to weight the data (see Appendix A).

Concession card holders can claim rebates on their utility bills (see Box 7.1). The 2010 survey found that a majority of respondents who were concession card holders were aware of these rebates and claimed them. For example, 90% of respondents who held a concession card knew they could claim rebates for their energy bills, and 86% of these respondents actually claimed them. Similarly, 86% of owner occupiers who held a concession card knew they could claim rebates for their water and sewerage bills, and 88 % of these claimed them.[76]

[76] Sydney Water provides rebates on fixed charges to owner occupiers only. Tenants do not directly pay any fixed charges.

Box 7.1 Concession arrangements for energy and water services

Who qualifies for concessions?

Concessions for household energy (electricity and gas) and water services are available to account holders who hold a Centrelink Pensioner Concession card, a Department of Veterans' Affairs (DVA) Concession card, or a DVA Gold Card marked with either war widow/widower pension, totally and permanently incapacitated, or disability pension. From 1 July 2010 energy rebates were also made available to Commonwealth Health Care card holders.

Centrelink Pensioner Concession cards are available to low-income households receiving selected payments (eg, age pension, single parenting payment or carer payment), to help with the cost of medicines and a range of concessions.

DVA Concession cards are available to war veterans who are service pensioners, age pensioners or war widows/widowers receiving an income support supplement. DVA Gold cards are issued to veterans, their widows/widowers and dependants who are entitled to treatment for all medical conditions.

Commonwealth Health Care cards are available to people who are below aged pension age and receive certain Centrelink support payments due to their low incomes.

What concessions are available for energy?

The NSW Government provides an energy rebate to eligible households for electricity and gas. The rebate is paid through electricity bills. On 1 July 2010 the rebate was increased to $145 per year (from $130 per year). It will increase to $161 per year on 1 July 2011.

What concessions are available for water and sewerage?

NSW water utilities provide rebates to owner-occupiers holding Pensioner Concession cards or qualifying DVA Gold cards. Tenants do not directly pay fixed charges for water or sewerage and are not eligible for rebates.

Sydney Water's pensioner rebates in 2009/10 were 100% of the fixed charge for water and 85% of the fixed charge for sewerage. These rebates were worth $527 per year (at the time of the 2008 survey the pensioner rebate was $175 for customers of Hunter Water, Gosford City Council and Wyong Shire Council. Hunter Water's maximum rebate increased to $207 in 2009/10).

Sources: NSW Department of Industry and Investment website, accessed September 2010 at *http://www.industry.nsw.gov.au/energy/customers/rebates*, Sydney Water Pensioner Rebates, Sydney Water June 2001, Centrelink website accessed September 2010 at *http://www.centrelink.gov.au/internet/internet.nsf/payments/conc_cards_pcc.htm* and *http://www.centrelink.gov.au/internet/internet.nsf/payments/conc_cards_hcc.htm*, DVA website accessed September 2010 at *http://www.dva.gov.au/pensions_and_compensation/Pages/pcc.aspx* and *http://www.dva.gov.au/benefitsAndServices/health/health_cards/Pages/gold.aspx*

However, while the majority of concession card holders claimed rebates, 22% of qualifying households did not claim energy rebates and 25% of qualifying owner-occupiers did not claim water rebates.[77]

7.5.3 Low-income households that do not hold a concession card may be more vulnerable to utility price increases

Low-income households that do not hold a concession card may be even more vulnerable to utility price increases than low-income households that do. These households may be more vulnerable because:

- They do not qualify for concessions and must pay the full amount of the bill.
- They tend to use more energy and water, and therefore face larger bills, than low-income households that hold a concession card (Figure 7.8). One major reason for this higher usage is that these households tend to be larger than low-income households that do hold a concession card. For example, the 2010 Sydney survey found the average number of people in these households is 2.3, compared to 1.7 in low-income households that held a concession card. Both the 2010 Sydney survey and the 2008 Hunter, Gosford and Wyong survey found a higher proportion of these households were couples with children, and lower proportion were 1 person households (Table 7.3).
- Higher proportions of these households rented privately or were paying off their home (Table 7.3). Higher accommodation costs are likely to put additional strain on the household budget.

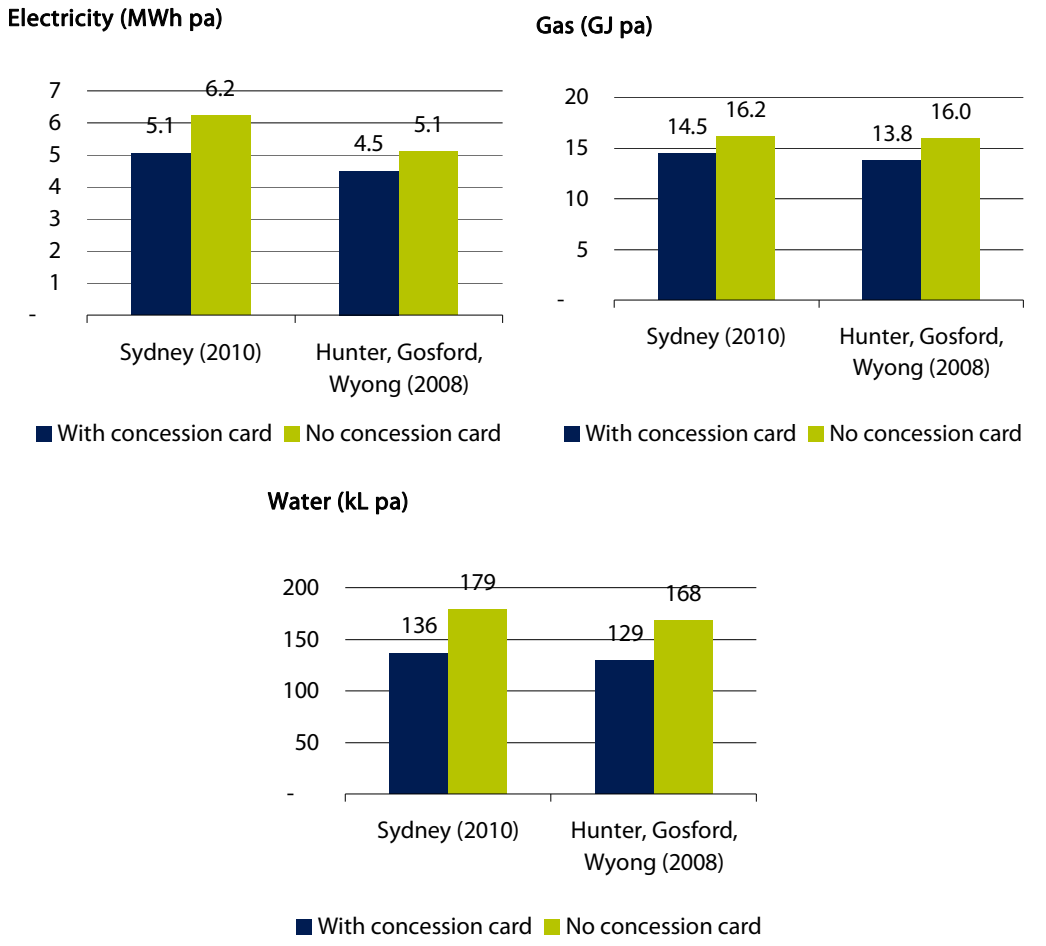
[77] Households that held a Pensioner Concession card were more likely to claim rebates than households that held a Veteran's Affairs Concession Card or did not know what their card was called. For example 81% of households with Pensioner Concession card claimed energy rebates compared to less than 50% of households with other concession cards.

Table 7.2 Characteristics for low-income households that hold a concession card and that do not hold a concession card, Sydney (2010) and Hunter, Gosford, Wyong (2008)[a]

Low income households that hold a concession card		Low income households that do not hold a concession card	
20% o f total households: surveyed	*(30%)*	5% o f total households: surveyed	*(5%)*
55% are 1 person households	*(41%)*	33% are 1 person households	*(34%)*
25% are couples with no children	*(39%)*	27% are couples with no children	*(25%)*
15% are single parent households	(*10%)*	10% are single parent households	*(12%)*
6% are couples with children	*(10%)*	30% are couples with children	*(30%)*
1.7 people per household	*(1.8)*	2.3 people per household	*(2.3)*
61% have fully paid off their homes	*(75%)*	58% have fully paid off their homes	*(53%)*
16% are renting (private)	(*13%)*	22% are renting (private)	*(25%)*
20% are renting (public)	(*9%)*	7% are renting (public)	*(6%)*
3% are paying off their homes	*(4%)*	14% are paying off their homes	*(15%)*

a Values for Hunter, Gosford, Wyong (2008) are in brackets and *italics.*

Figure 7.8 Average consumption of low-income households with a concession card and without a concession card (Sydney 2010)



Low-income households that did not hold a concession card constituted only a small proportion of our whole 2010 and 2008 survey samples (5%). Nevertheless, these households represent an important section of the population who may be particularly vulnerable to utility price increases, and may find it difficult to pay utility bills. We discuss payment difficulties in Chapter 8.

8 Financial difficulties paying utility bills

To better understand vulnerability to utility price increases, we asked survey respondents if they had felt financially unable to pay their electricity, gas and water bills in the last 3 years, and if so, whether this was within the past year.[78] We then asked if they had approached their supplier about payment difficulties, and what help they had received. We analysed the responses by looking at the household characteristics of respondents who said they had felt financial unable to pay utility bills, as well as those who had approaches their suppliers.

We also explored whether respondents who indicated they had felt financially unable to pay their utility bills had sought other forms of assistance. Specifically, we asked if those respondents had obtained Energy Accounts Payment Assistance (EAPA) vouchers for energy bills or payment assistance scheme (PAS) vouchers for water bills. Finally, we asked if they had ever been disconnected by their supplier.

In relation to financial difficulties paying utility bills, we found that:

- Households were more likely to have felt financially unable to pay their electricity bills than their water or gas bills, and were more likely to have approached their electricity supplier because they could not pay their bill.
- The proportion of low-income households that had felt financially unable to pay utility bills in the past year was much higher than the proportion of middle-income households and the proportion of high-income households. This is different to our 2008 findings in the Hunter, Gosford and Wyong areas, where we found that the proportion of middle-income households that had experienced financial difficulty was very similar to the proportion low-income households.
- However, income is only one factor that affects the likelihood that a household will experience financial difficulty paying its bills. We found that, compared to households that had not experienced payment difficulties, those that had were also more likely to:
  - have 3 or more occupants (and therefore to include children)
  - be renting or paying off their homes
  - use large amounts of electricity (more than 8 MWh per year).

[78] The results regarding payment difficulties are to be interpreted with caution due to the small sample size for some of the categories.

The most common response by suppliers to being approached by a customer about payment difficulties was to extend the due date of the bills. Very few households had their electricity or gas disconnected or their water flow restricted. Only a small number of households had received EAPA or PAS vouchers in the previous 3 years to help pay their utility bills.

It is important to note that the 2010 survey may not have captured all the households that had approached their supplier about their financial difficulties in paying their bills. In addition, we may not have captured all the households that received EAPA or PAS vouchers to help them pay utility bills. This is because we only sought this information from those respondents who had indicated they had felt financially unable to pay their bills in the previous 3 years. Evidence from the 2008 survey in the Hunter, Gosford and Wyong areas suggests that households may say they did not have difficulty paying their bills even though (and perhaps *because*) they had sought help. One consequence of this is that we were unable to meaningfully compare the results from the 2 Sydney surveys about approaches to suppliers.

The rest of this chapter discusses these findings in more detail.

8.1 Do more households have trouble paying their electricity bills than their gas or water bills?

We found that more households in Sydney (2010) had trouble paying their electricity bills than either their gas or water bills. This is consistent with the findings of the 2008 survey in the Hunter, Gosford and Wyong areas, as shown in Figure 8.1.[79] Possible reasons why more households had difficulty paying their electricity bills are discussed in Box 8.1.

[79] We did not ask this question in the 2006 Sydney survey.

Box 8.1 Why are households more likely to experience difficulty paying their electricity bills their gas or water bills?

Households may be more likely to approach their electricity supplier with payment difficulties than their gas or water supplier because:

1. Electricity bills tend to be larger than gas or water bills.
2. Gas customers have higher incomes, on average, than electricity customers (see Chapter 5). Fewer are therefore likely to have difficulty paying their bills.
3. Water bills are likely to be comparatively small for most low-income owner-occupiers, because they receive relatively large rebates on the fixed charges (see Chapter 7, Box 7.1).
4. Tenants, who tend to have the greatest difficulty paying their energy bills, do not pay fixed water, sewerage or stormwater charges directly to their utility, and only sometimes pay usage charges directly. In addition, bills for usage are usually fairly small.

Only a small proportion of households in Sydney (2010) indicated that they had felt financially unable to pay their gas bills in the last year (6% of low-income households and 4% or less of other households). A higher proportion of households in the Hunter, Gosford and Wyong areas reported such difficulties in 2008, particularly in the low- and middle-income groups. The reasons for the differences between the areas are unclear.

Only 4% or less of households in Sydney (2010) indicated they had felt financially unable to pay their water bills in the last year across all income groups, and even fewer had felt this in the previous 2 years (but not the last year). Again, a higher proportion of households in the Hunter, Gosford and Wyong areas reported such difficulties in 2008. Part of the reason for this might be that Sydney Water provides larger rebates to owner-occupiers than the other water suppliers. For example, in 2009/10 the total value of the rebate available to qualifying Sydney Water customers was $527 compared to only $175 for similar customers in the Hunter, Gosford and Wyong areas at the time of the survey (2008). Concessions are discussed in Box 7.1 in Chapter 7.

8.2 What are the characteristics of households that experienced difficulty paying their utility bills?

We investigated the characteristics of households that indicated they had difficulty paying their utility bills first by focusing on income levels, and second by identifying other characteristics of households that had experienced such difficulty. We focussed mainly on electricity bills because households experienced significantly more difficulty paying these bills that their gas or water bills (see section 8.1).

8.2.1 Relationship between income and feeling financially unable to pay electricity bills

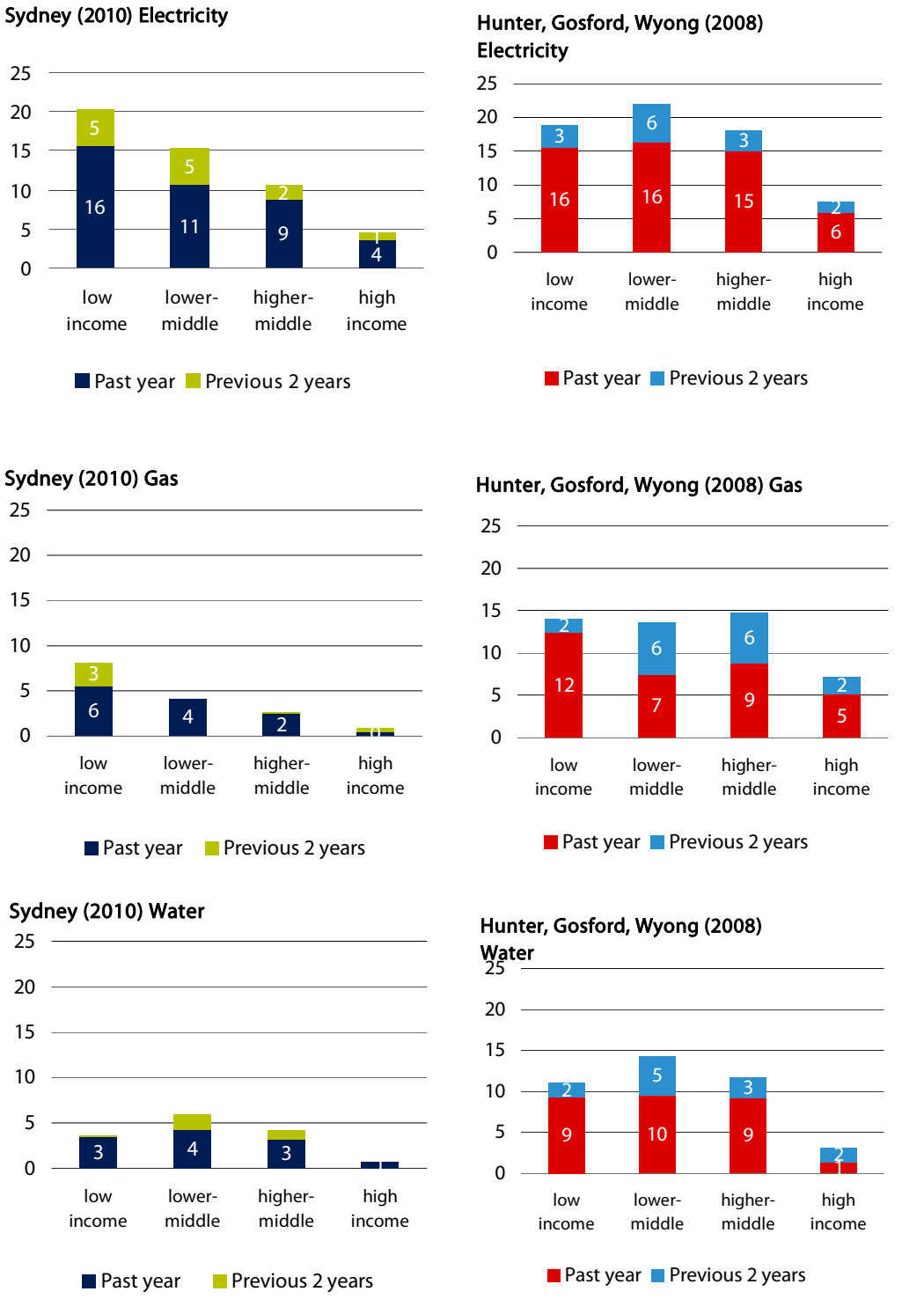
We found the proportion of households that reported having felt financially unable to pay electricity bills in the past 3 years was much higher in the low-income category than in the other categories For example, 16% of households in the low-income category said they had felt this way in the last year, compared to between 9% and 11% of households in the middle-income groups, and only 4% in the high-income group reported.

These findings differ somewhat from our findings in the Hunter, Gosford and Wyong areas (2008). In particular, in the latter areas we found that the proportion of households that had experienced difficulty paying their electricity bills in the last year was as high in the middle-income categories as it was in the low-income categories (around 16%).

As indicated above, in Sydney (2010) only a small proportion of households in all income groups indicated that they had felt unable to pay their gas or water bills. Again, these findings differ from our findings in the Hunter, Gosford and Wyong areas (2008) where a higher proportion of households in all categories had experienced financial difficulty (Figure 8.1).

The majority of respondents who said they had felt financially unable to pay their bills in the last 3 years indicated that this occurred within the past year. For example, 16% of low-income households in Sydney had experienced difficulty paying their electricity bills in the past year, and an additional 5% had experienced difficulty in the previous 2 years but not in the last year (Figure 8.1).

Figure 8.1 Proportion of households that had experienced financial difficulty paying utility bills in the last year and previous 2 years (%)[a]



[a] Table 2.1 in Chapter 2 explains what the different income groups mean.

Note: The values for low-income households and high-income households with gas for Hunter, Gosford, Wyong (2008) should be interpreted with caution due to the small sample sizes.

8.2.2 Relationship between other household characteristics and feeling financially unable to pay electricity bills

Other household characteristics, in addition to income, are also associated with increased likelihood of difficulty paying electricity bills. This can be seen in Table 8.1, which divides the survey sample into 2 groups: those that had experienced payment difficulties in the past 3 years and those that hadn't. It then identifies the characteristics of the 2 groups using different criteria, for example, concession card status, household structure, dwelling ownership status and electricity consumption.

Comparing the 2 groups in Sydney (2010), we found that the group that had felt financially unable to pay their electricity bills (group 1) included:

- Higher proportions of households that included a concession card holder (42% compared to 31%), and households that had claimed concessions on energy bills (32% compared to 24%).
- A higher proportion of respondents[80] aged less than 55 years (63% compared to 41%).
- A higher proportion of households comprising couples with children (44% compared to 37%) and single parent families (24% compared to 10%), but a lower proportion of households comprising couples with no children living at home (9% compared to 26%).
- Therefore, a higher proportion of households comprising 3 or more people (58% compared to 43%).
- A higher proportion of households that are paying off their home (34% compared to 22%) or renting (35% compared to 16%), but a lower proportion households that have paid off their home (30% compared to 62%).
- A higher proportion of large electricity users (households that use more than 8 MWh per year) (47% compared to 33%).

For comparison, Table 8.1 also compares the 2 groups for the Hunter, Gosford and Wyong areas (2008) (in brackets and *italics*). This comparison shows that the characteristics of each group were similar to those for Sydney (2010), with one important exception. In the Hunter, Gosford and Wyong areas, households that included a concession card holder (and those that had claimed concessions) comprised a *smaller* proportion of all households that had experienced difficulty paying their electricity bills (group 1) than those that hadn't (group 2). For example, 44% of households that had experienced payment difficulties had a concession card, compared to 49% of households that had not had such difficulties. The reasons for this are unclear.

80 The respondent was the person responsible for paying the household bills.

Table 8.1 Characteristics of households that have had difficulty paying electricity bills compared to those that have not, Sydney (2010) and Hunter, Gosford, Wyong (2008)[a]

Group 1		Group 2	
Households with difficulty paying electricity bills in last 3 years		**Households without difficulty paying electricity bills in last 3 years**	
43% are low-income households	*(46%)*	26% are low-income households	*(42%)*
51% are middle-income households	*(44%)*	54% are middle-income households	*(38%)*
6% are high-income households	*(4%)*	20% are high-income households	(10%)
42% have a concession card	*(44%)*	31% have a concession card	*(49%)*
32% claim concessions on energy bills	*(36%)*	24% claim concessions on energy bills	*(44%)*
63% of respondents are less than 55 years old	*(73%)*	41% of respondents are less than 55 years old	*(38%)*
44% are couples with children	*(48%)*	37% are couples with children	*(31%)*
24% are single parents	*(18%)*	10% are single parents	*(6%)*
22% are 1 person households	*(15%)*	25% are 1 person households	*(25%)*
10% are couples with no children	*(16%)*	28% are couples with no children	*(34%)*
58% have 3 or more people in their household	*(60%)*	43% have 3 or more people in their household	*(34%)*
30% have fully paid off their home	*(28%)*	62% have fully paid off their home	*(67%)*
34% are paying off their home	*(35%)*	22% are paying off their home	*(20%)*
35% are renting (25% renting privately)	*(36%)*	16% are renting (12% renting privately)	*(13%)*
19% use less than 4 MWh pa	*(22%)*	28% use less than 4 MWh pa	*(33%)*
47% use more than 8 MWh pa	*(29%)*	33% use more than 8 MWh pa	*(21%)*

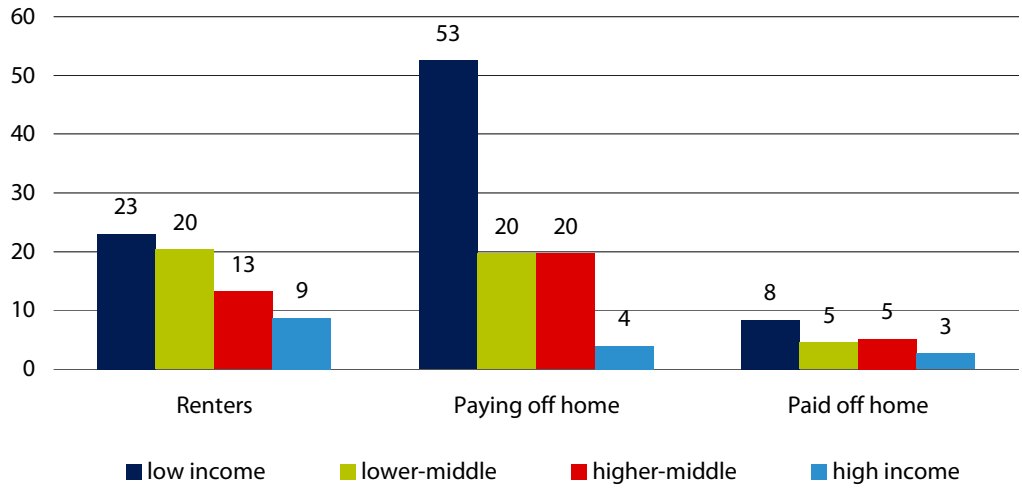
a The figure for Hunter, Gosford, Wyong (2008) are show in brackets and *italics.*

Our analysis shows that payment difficulties are not confined to low-income households, or to households that hold a concession card. Payment difficulties may also be experienced by low-income and middle-income households that do not hold a concession card and are renting or paying off their home, have larger households (usually because they have children living at home), and/or that consume relatively large amounts of electricity.

Figure 8.2 provides closer analysis of the households in Sydney (2010) that had experienced financial difficulty paying electricity bills in the past year by ownership and income levels. It shows, for example, that 20% or more of low-income and lower-middle-income households that were either renting or paying off their homes indicated that they had felt financially unable to pay their electricity bills. In

comparison, only 8% of low income households that had paid off their homes reported this difficulty.[81]

Figure 8.2 Proportion of households that had experienced financial difficulty paying electricity bills in the last year, by income and ownerships status, Sydney (2010) (%)

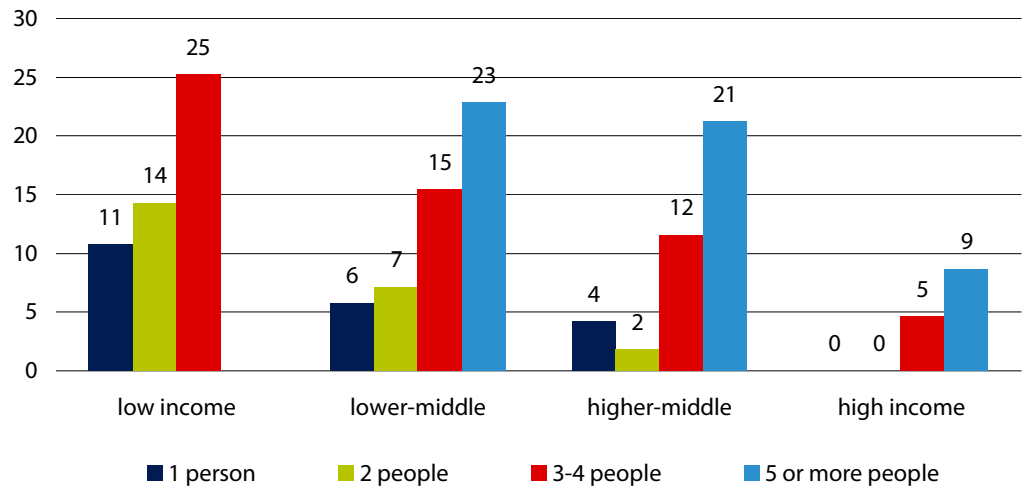


Note: The result for low-income households paying off their homes need to be interpreted with caution due to a small sample size (29) of households in the category.

Similarly, Figure 8.3 provides closer analysis of the households in Sydney (2010) that had experienced financial difficulty paying electricity bills in the past year by household size and income levels. It shows that in all income categories, a higher proportion of households with 3 or more people living at home indicated that they had felt financially unable to pay their electricity bills than households with only 1 or 2 occupants. For example, in the lower-middle income category, 15% of 3 to 4 person households and 23% of 5 or more person households indicated they had felt this way, compared to only 6% to 7% of 1 or 2 person households.

[81] Low-income households paying off their homes have been excluded due to a sample size of less than 30.

Figure 8.3 Proportion of households that had experienced financial difficulty paying electricity bills in the last year, by income and household size, Sydney (2010) (%)



Note: Low-income households with 5 or more occupants have been excluded due to a small sample size.

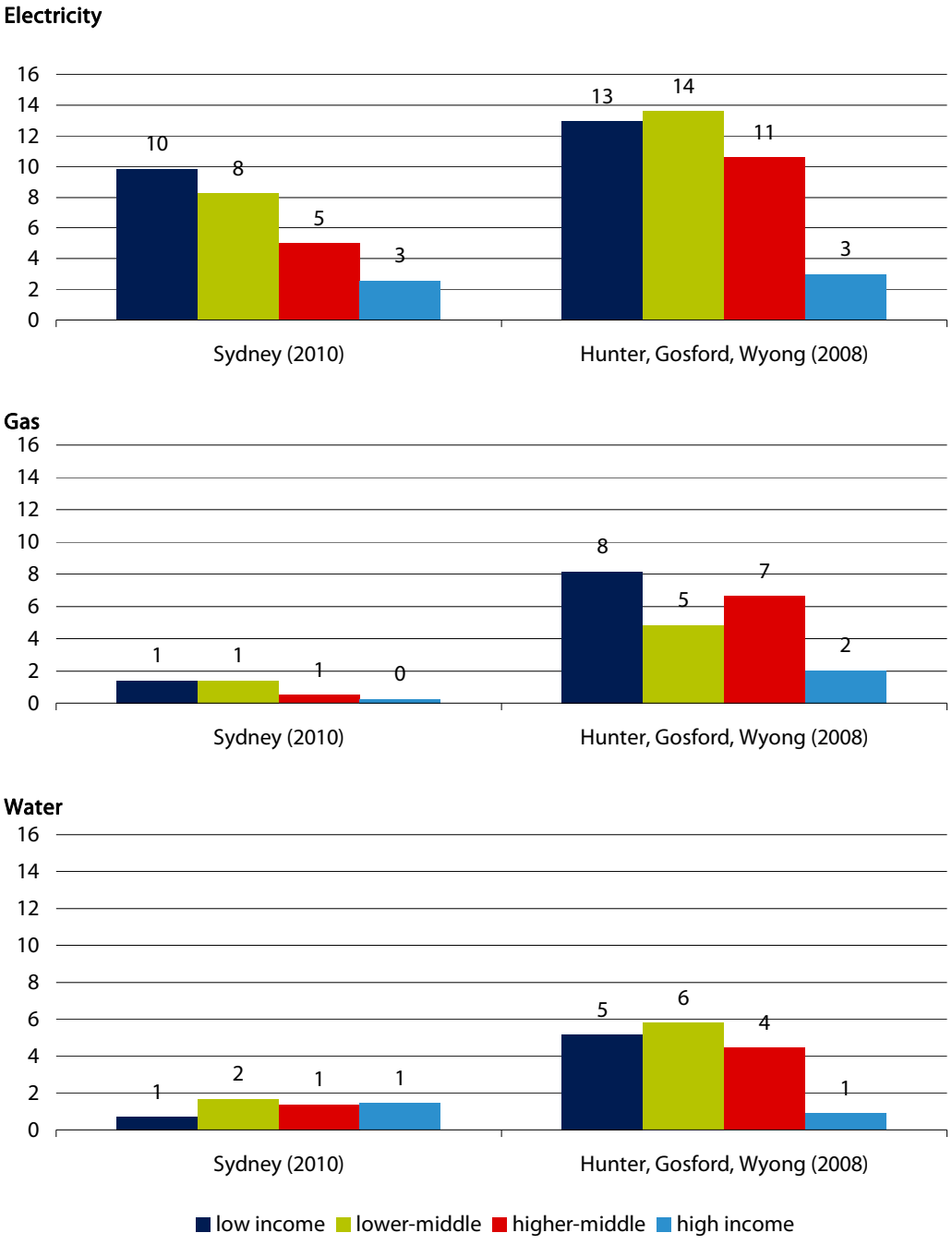
8.3 Who approached their suppliers due to financial difficulty paying utility bills?

Consistent with the findings that households were more likely to have had difficulty paying electricity bills (see section 8.1 above), we found that significantly more households had approached their electricity supplier with payment difficulties than had approached their gas or water suppliers (Figure 8.4).

In addition, consistent with the findings on the income and other household characteristics associated with increased likelihood of having had difficulty paying electricity bills (see section 8.2 above), we found that:

- a higher proportion of low-income households had approached their electricity suppliers due to financial difficulty in paying their bills than had middle- and high-income households
- low- and middle-income households in the Hunter, Gosford and Wyong areas were more likely to have approached their suppliers than similar households in the Sydney area (Figure 8.4)
- lower income households that were also renters or were paying off their homes were more likely to have approached their electricity supplier than those who had paid off their homes (Figure 8.5)
- larger households were more likely than smaller household to have approached their electricity suppliers than smaller households (Figure 8.6).

Figure 8.4 Proportion of households that had approached their supplier in the last 3 years because they had financial difficulty paying utility bills (%) [a,b,c]

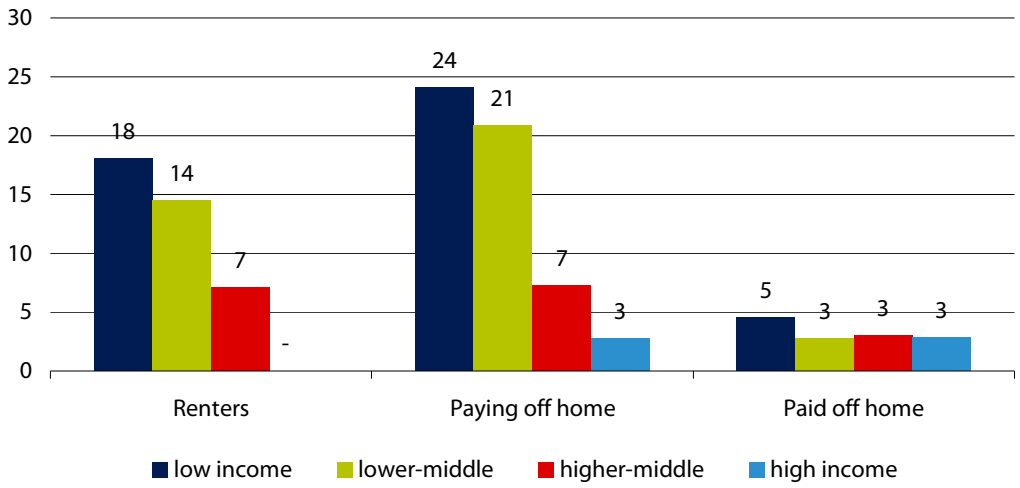


a Proportion of total households, not just of households that felt financially unable to pay their utility bills in the last 3 years.

b Only households that indicated that they had trouble paying their electricity bills were asked whether they had approached their supplier. This may have excluded some households.

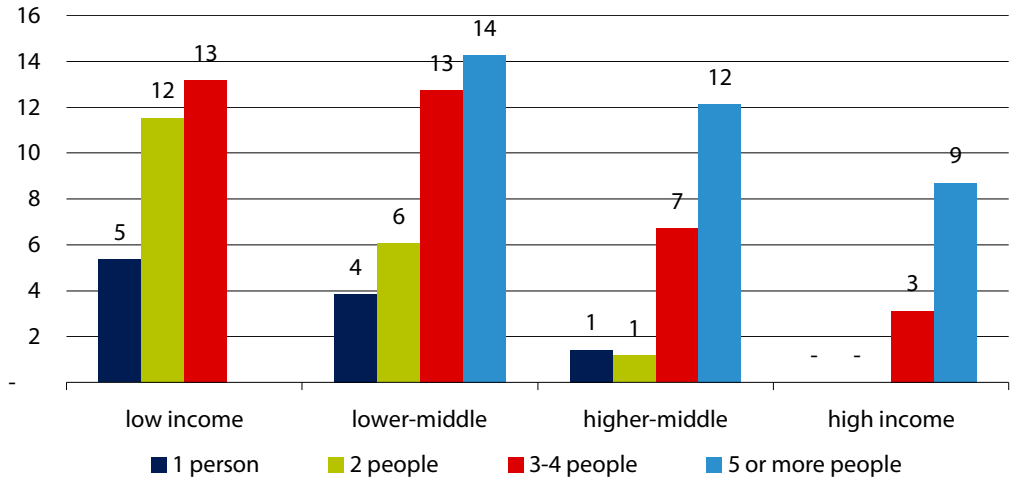
c The values gas for Hunter, Gosford, Wyong (2008) should be interpreted with caution due to the small sample sizes of people with gas, particularly in the low income and high income categories.

Figure 8.5 Proportion of households that had approached their electricity supplier in the last 3 years because they had financial difficulty paying bills, by income and ownerships status, Sydney (2010) (%)



Note: The result for low-income households paying off their homes need to be interpreted with caution due to a small sample size of households in the category (29).

Figure 8.6 Proportion of households that approached their electricity supplier in the last 3 years because they had financial difficulty paying bills, by income and number of occupants, Sydney (2010)



Note: Low-income households with 5 or more occupants have been excluded due to a small sample size.

8.4 Did more Sydney households have difficulty paying bills in 2010 than 2006?

We also compared our findings on the proportion of Sydney households that had approached their energy supplier due to payment difficulties in 2010 and 2006. We expected to see an increase in this proportion because energy prices increased significantly between 2006 and 2010 (see Chapter 3). Also, the Energy and Water Ombudsman (EWON) has indicated that, over the past year, 'financial hardship and anxiety over the affordability of energy bills has resulted in an increase in billing and credit related complaints to EWON'.[82]

However, we found that a *smaller* proportion of households reported they had approached their electricity or gas suppliers in 2010 compared to in 2006. The explanation for this may lie in the fact that the 2006 survey asked *all* respondents whether they had approached their supplier because they were unable to pay their bill, while the 2010 survey only asked respondents who reported financial difficulty paying their bills. In the 2010 survey, some households may have indicated they had not had financial difficulty paying their bills, *because* they had approached their supplier or taken other steps to avoid such difficulty.[83] These households would not have been asked whether they had approached their supplier. Also, the 2006 survey may have captured people who had trouble paying their bills for other reasons other than financial stress, for example due to technical difficulties with a credit card[84].

8.5 What assistance did utility suppliers offer when approach by households experiencing financial difficulty?

The Sydney 2010 survey found that most common response from suppliers when approached by a household with payment difficulties was to extend the due date on the bill – 69% of respondents reported this response from their electricity suppliers, 92% from their gas supplier and 63% from their water supplier. The next most frequent response was to allow the bill to be paid off in instalments. This was similar to the findings of both the Hunter, Gosford and Wyong survey (2008) and the Sydney (2006) survey.

82 Energy and Water Ombudsman, *2009/10 Annual Report*, p 25.

83 See the discussion about EAPA vouchers below.

84 The 2006 survey didn't ask whether households had experienced financial difficulty paying their bills. It only asked whether households had approached their supplier because they had been unable to pay their bills.

8.6 How many households received EAPA or PAS vouchers?

Households experiencing financial difficulty paying electricity or gas bills may be eligible to receive Energy Accounts Payment Assistance (EAPA) vouchers to help pay these bills (see Box 8.2). We found that in Sydney in 2010, only a small proportion (9%) of respondents who had experienced difficulty paying their electricity bills in the past 3 years had received EAPA vouchers. This is a smaller proportion than in the Hunter, Gosford and Wyong areas in 2008, where 16% of such respondents had received EAPA vouchers.

Similarly, people experiencing financial difficulties paying their water bills may be eligible to receive Payment Assistance Scheme (PAS) vouchers to help pay these bills (see Box 8.2).[85] Again, only 9% of respondents in Sydney (2010) who had experienced difficulty paying their water bills in the past 3 years received PAS vouchers.[86]

When respondents did not receive EAPA or PAS vouchers, but had experienced difficulty paying their energy or water bills, the most common reason given was that they did not know about the program (respectively 33%and 35% of respondents). The next most common reason was that they paid the bill late instead (respectively 22%and 19% of respondents).

The Sydney (2010) survey may have not have captured all the households that received EAPA or PAS vouchers in the previous 3 years. Like the question about approaching their supplier, only respondents who indicated they had experienced financial difficulty paying their bills were asked whether they had received EAPA or PAS vouchers. As a result, the survey may have missed a significant number of respondents who had received the vouchers but indicated that they had not had difficulty paying their bills. This possibility is suggested by the finding of the 2008 survey in the Hunter, Gosford and Wyong areas that more than 60% of respondents who had received EAPA vouchers reported that they had not experienced financial difficulty paying their bills. (The 2008 survey asked all respondents whether they had received EAPA vouchers).[87]

85 PAS vouchers are only available to Sydney Water and Hunter Water customers.

86 The Hunter, Gosford and Wyong survey (2008) did not ask about the use of PAS vouchers.

87 In the Hunter, Gosford and Wyong areas, about 7% of all households received EAPA vouchers over a 3-year period.

Box 8.2 Energy Accounts Payment Assistance (EAPA) vouchers and Payment Assistance Scheme (PAS) vouchers

The NSW Government funds a program to help financially disadvantaged people who are experiencing payment difficulties because of a crisis or emergency situation. Community welfare organisations, such as St Vincent de Paul and the Salvation Army, distribute the vouchers on behalf of the NSW Government.

- NSW residents can use EAPA vouchers to pay their electricity or gas bill (each voucher is worth $30).
- Sydney Water or Hunter Water customers can use PAS vouchers to pay for the usage component of their water bills (each voucher is worth $25).

To receive a voucher, an application needs to be made directly to a community welfare organisation. The organisations will assess the applicant's situation and consider whether it is appropriate to provide assistance.

The aim of the voucher programs is to ensure people stay connected to essential services during a financial crisis. V vouchers are therefore not available on an ongoing basis.

Sources: Energy & Water Ombudsman NSW (EWON) website, accessed September 2010 *http://svc252.wic024v.server-web.com/publications/7_5_2.html* and NSW Government, Department of Industry and Investment website accessed September 2010, *http://www.industry.nsw.gov.au/energy/customers/help*

8.7 How frequently did payment difficulties result electricity or gas disconnection or water flow restriction?

The survey asked respondents whether their electricity or gas had been disconnected or their water flow restricted in the last 3 years because they had not paid their bills. Less than 1% of respondents had their electricity or gas disconnected or their water flow restricted.[88] This finding is consistent with the finding that suppliers offer some flexibility when a customer faces difficulty paying their bill, by extending the due date and allowing the bill to be paid off in instalments.

[88] This refers to 1% of respondents who indicated they had experienced financial difficulty paying their bills. Only these respondents were asked whether they had had their electricity of gas disconnected for their water flow restricted. In the Sydney (2006) and Hunter, Gosford, Wyong (2008) surveys we asked all respondents.

9 Public transport

We asked survey respondents whether anyone in their household had used a bus, train, ferry or taxi in the previous 7 days, and whether this travel was free school travel under the NSW Government's School Student Transport Scheme (SSTS). We also asked households how many private vehicles they had.

Regarding the use of public transport, we found that:

- Bus and train travel were by far the most common forms of public transport, and most households paid for public transport tickets (rather than travelling for free under the SSTS).
- High-income households and households with children were more likely to have used public transport than low-income households and 1 or 2 person households without children.
- Low-income households with school-aged children were more likely to have made use of SSTS travel than households with school-aged children in the higher income groups.
- Including free school travel, about 60% of households had used a bus, train and/or ferry in the previous 7 days. But the proportion of households that used public transport in specific areas depended partly on how well these areas are served. We found that this proportion varied from 82% of households in the North Sydney/Manly area to 32% in Lake Illawarra.
- Only 5% of households had used a taxi in the previous 7 days.

Regarding private vehicles, we found that higher income households on average had more vehicles than lower income households, and that couples with children on average had more vehicles than other household types. One person households had the lowest average number of vehicles.

We also found that households tended to have more vehicles in areas where pubic transport use was low. Conversely, households tended to have fewer private vehicles in areas where public transport use was high. However, more than half of households with at least 1 private vehicle also used public transport, suggesting that access to a private vehicle is only one of many factors that determine public transport use in Sydney.

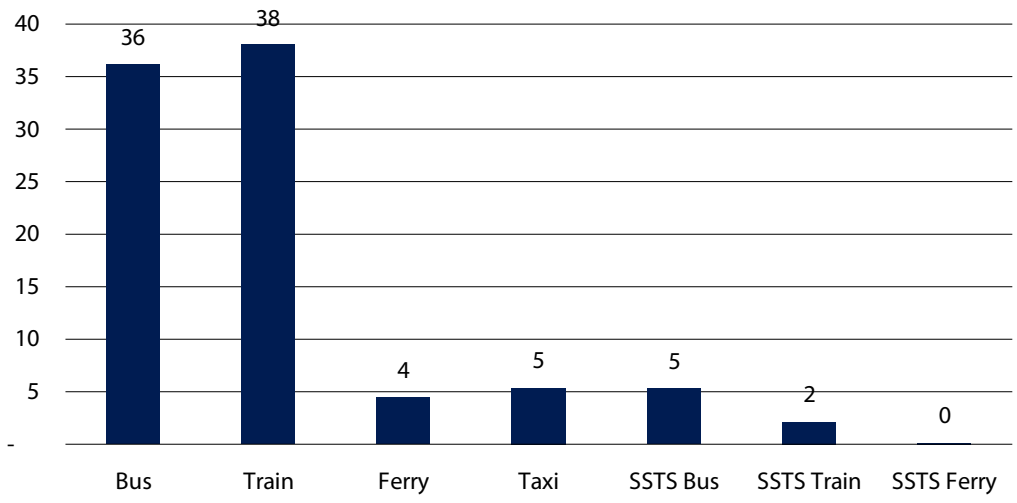
We discuss these findings in more detail below.

9.1 The modes of public transport most frequently used

Bus and train travel are by far the most common forms of public transport in Sydney. Looking at fare-paying passengers, we found that 36% of households had used a bus in the previous 7 days, and 38% of households had used on a train. Only 5% of households had used a taxi and only 4% had used a ferry. Looking at SSTS travel, we found that less than 7% of households had travelled on a bus, train or ferry under this scheme in the previous 7 days (Figure 9.1).

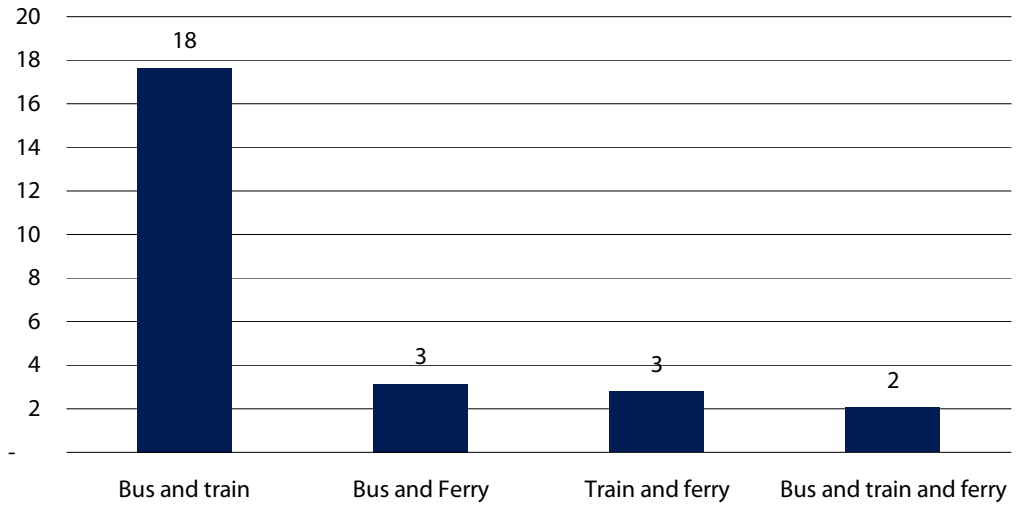
Overall, 57% of households had used buses, trains and/or ferries in the past 7 days as fare-paying passengers. When free school transport is included, 60% of households had used one of more of these services.

Figure 9.1 Proportion of households that had used public transport in the past 7 days, by transport mode, Sydney (2010) (%)



Some households had used more than one mode of transport, and the most common combination for fare-paying passengers was bus and train (18%, see Figure 9.2). Bus and train was also the most common combination of modes for SSTS travel.

Figure 9.2 Proportion of households who had used more than 1 type of public transport in the past 7 days, Sydney (2010)[a] (%)



a Fare-paying passengers only (ie excluding SSTS).

9.2 Relationship between geographical area and public transport use

As expected, we found that the extent and the type of public transport use differed between geographical areas, depending largely on the availability of the different modes of transport. This can be seen in Table 9.1, which shows the proportion of households that had used public transport in the previous 7 days in the Sydney metropolitan area (broken in sub-areas), the Blue Mountains and the Illawarra.[89] For example, it shows that:

- In the City area, which is well-served by both buses and trains, half of the households had used a bus and half had used a train as fare-paying passengers. When SSTS travel is included, 78% of City households had used a bus and/or train.
- In the North Sydney to Manly area, which is well served by buses and trains (in North Sydney) or ferries (in Manly), 64%of households had used a bus, 34% had used a train and 33% had used a ferry as fare-paying passengers. When SSTS travel is included, 82% of households in this area had used one or more of these transport modes.
- In the Collaroy to Palm Beach area, where there is a bus service but no train service, 47% of households had used a bus but only 8% had used a train while as fare-paying passengers. When SSTS travel is included, 57% of households living in this area had used a bus and/or train and/or ferry.

89 The suburbs that are include in the survey areas are shown in Appendix B.

- In the Campbelltown to Mittagong area, where there is a fairly good train service but a limited bus service, 27% of households had used a train while only 14% had used a bus as fare-paying passengers. When SSTS travel is included, 37% of households living in this area had used a bus and/or train and/or ferry.

The use of taxis also differs between the areas, and is highest in the City area (13% of households) followed by the Eastern suburbs (10%). Only 1% of households in the Liverpool, Campbelltown to Mittagong and Lake Illawarra areas had used a taxi in the previous 7 days.

Table 9.1 Proportion of households who had used public transport in the past 7 days, by transport mode and survey area, Sydney (2010)

		Bus Fare-paying	Train Fare-paying	Ferry Fare-paying	Taxi	SSTS Bus	SSTS Train	SSTS Ferry	Bus and/or train and/or ferry excluding SSTS	Bus and/or train and/or ferry including SSTS
Sydney Central	City	50	50	-	13	6	-	-	72	78
Sydney	North Sydney to Manly	64	34	33	8	6	-	-	78	82
North	Concord to Lane Cove	64	34	18	9	10	1	-	74	76
East	Ryde to Hornsby	32	52	4	3	4	5	-	67	68
	Collaroy to Palm Beach	47	8	3	6	8	-	-	50	57
Sydney	North Rocks to Parramatta	34	44	1	3	3	4	-	52	53
North	Blacktown to Penrith	27	35	1	5	9	2	-	46	50
West	Baulkham Hills to Rouse Hill	31	26	3	2	7	-	-	41	45
Sydney	Bankstown to Georges Hall	27	47	1	2	4	4	-	56	60
South	Liverpool	25	29	-	1	7	1	-	41	43
West	Villawood to Cabramatta	33	33	1	6	1	1	-	50	52
	Campbelltown to Mittagong	14	27	-	1	7	-	-	34	37
Sydney	Balmain to Strathfield	58	41	4	9	6	4	1	76	78
South	Eastern Suburbs	64	31	8	10	4	1	-	74	74
East	Botany to Arncliffe	52	49	6	8	6	4	-	74	77
	Lakemba to Hurstville	33	59	1	5	3	3	1	68	68
	Sutherland Shire	16	44	4	3	3	2	-	48	51
Blue Mountains		11	48	1	8	3	2	-	48	49
Illawarra	Wollongong	30	24	1	7	5	3	-	44	48
	Lake Illawarra	9	22	1	1	5	1	-	28	32
Total		**36**	**38**	**4**	**5**	**5**	**2**	**0**	**57**	**60**

Note: The suburbs included in each of the survey areas are shown in Appendix B.

9.3 Relationship between income and public transport use

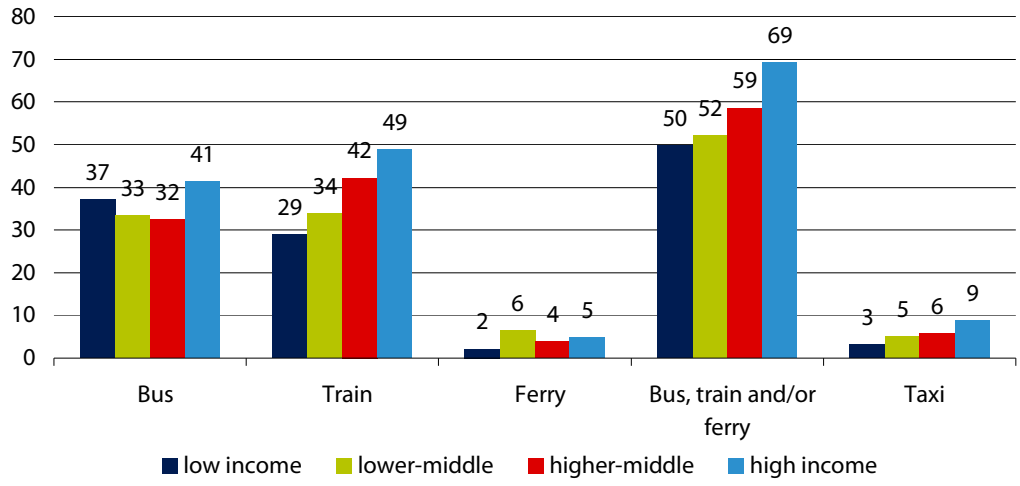
9.3.1 Use of public transport as fare-paying passengers

As fare-paying passengers, a higher proportion of high-income households had used a bus, train and/or ferry than had low-income households. For example, 69% of high-income households had used one or more of these transport modes in the previous 7 days compared to 50% of low-income households (Figure 9.3).

In terms of the different transport modes used by fare-paying passengers:

- A higher proportion of high-income households had used train services than had low-income households (49% compared to 29%).
- Similar proportions of high- and low-income households had used bus services (41% compared to 37%). Also, unlike train travel, a somewhat higher proportion of low-income households had used this mode of transport than middle-income households (37% compared to around 32%).

Figure 9.3 Proportion of households who had used public transport as fare-paying passengers in the past 7 days, by income, Sydney (2010) (%)[a]



a Fare-paying passengers only (ie excluding SSTS).

Note: The values for ferries and taxis need to be interpreted with caution due to the small sample sizes.

- Similar proportions of middle- and high-income groups had used ferries (between 4% and 6%). However, these results need to be interpreted with caution due to the small sample size.[90]

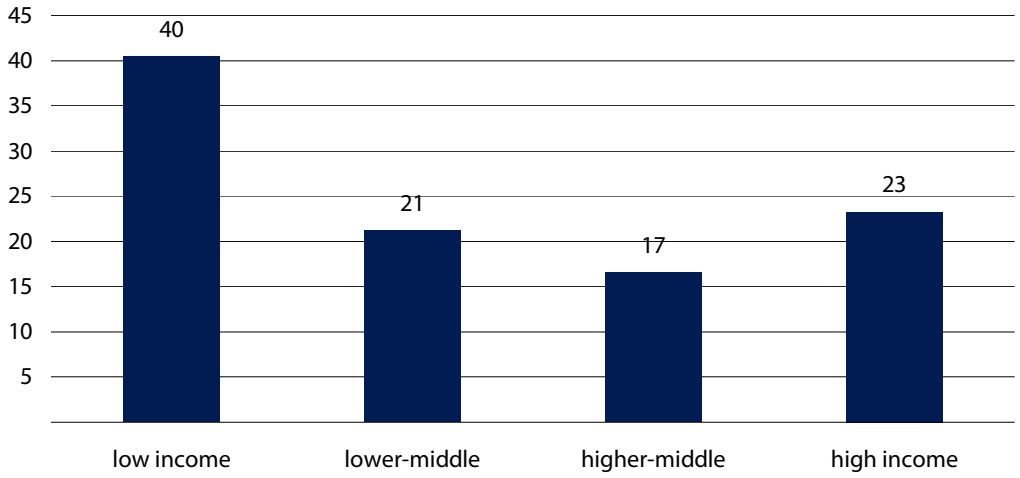
90 A total of 97 households had used a ferry in the previous 7 days.

- The use of taxis increased with household income levels, with 9% of high-income households using a taxi in the previous 7 days compared to around 6% of middle-income households and 3% of low-income households. But these results, too, need to be interpreted with caution due to the small sample size.[91]

9.3.2 Use of public transport under SSTS

Looking at SSTS travel by households with school-aged children,[92] a higher proportion of low-income households made use of this kind of public transport than households in the higher income groups (40% compared to between 17% and 23%). However, these values should be treated with caution due to the limited sample size (Figure 9.4).[93]

Figure 9.4 Proportion of households with children aged 6 to 15 years that had used SSTS transport in the past 7 days, by income, Sydney (2010) (%)



Note: Includes households with children, where most children are between the ages of 6 and 15 years. Values should be treated with caution due to the limited sample size.

91 A total of 118 households had used a taxi in the previous 7 days.

92 This includes households with children, where most children are between the ages of 6 and 15 years.

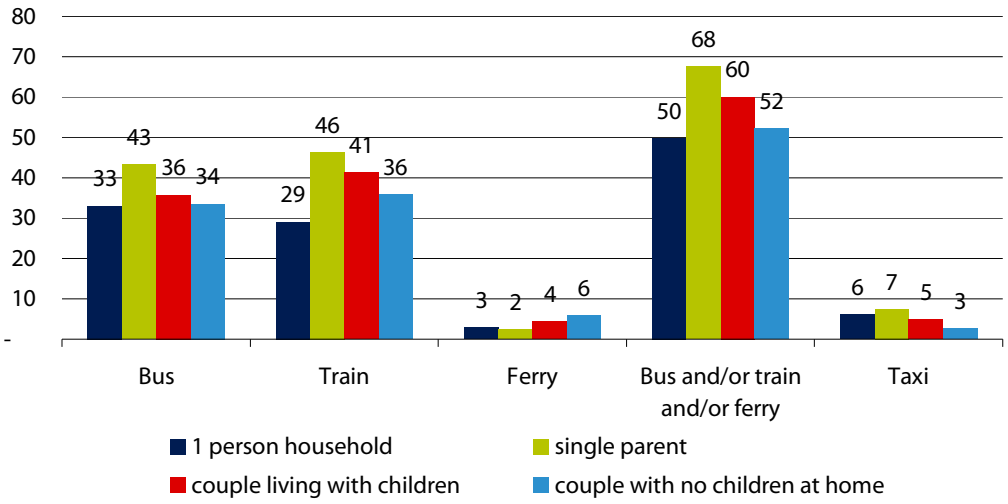
93 The survey sample included a total of 246 households with school-aged children, varying between 44 low-income households and 93 higher-middle income households.

9.4 Relationship between household structure and public transport use

9.4.1 Use of public transport as fare-paying passengers

As fare-paying passengers, single parent households and, to a lesser extent, couples with children were more likely to have made use of public transport than either people living alone or couples with no children at home. For example, 68% of single parent households had made use of buses, trains and/or ferries in the previous 7 days, compared to 60% of couples with children and just over 50% of couples without children and people living alone (Figure 9.5).

Figure 9.5 Proportion of households that had used public transport in the past 7 days, by household structure, Sydney (2010)[a] (%)



[a] Fare-paying passengers only (ie excluding SSTS).

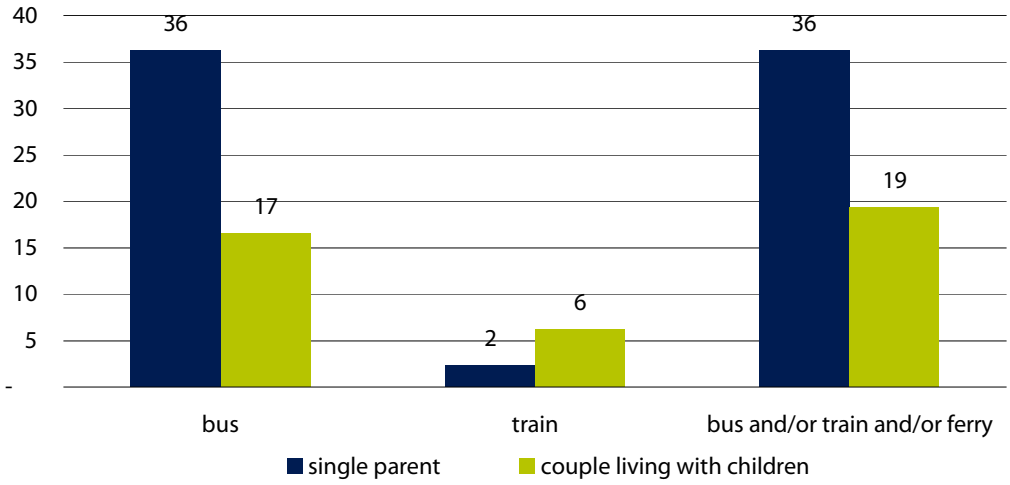
Note: The values for ferries and taxis need to be interpreted with caution due to the small sample sizes.

9.4.2 Use of public transport under SSTS

Looking at households that include school-aged children, a higher proportion of single parent households had made use of SSTS travel than had couples living with children (36% compared to 19%). Most of this travel was by bus (Figure 9.6).

However, looking at travel by train only, the opposite is true: a smaller proportion of single parent households had made use of STSS travel than had couples with children (2% compared to 6%). However, the proportion was small for both household structures and the comparison should be treated with caution.

Figure 9.6 Proportion of households with school-aged children that had used SSTS transport in the past 7 days, by household structure, Sydney (2010) (%)



Note: Includes households with children, where most children are between the ages of 6 and 15 years. Values should be treated with caution due to the limited sample size for single parent households.

9.5 Private vehicles and public transport use

We asked respondents how many registered vehicles were used by their household and were regularly parked at their home overnight.

9.5.1 Average number of private vehicles by income and household structure

Not surprisingly, we found that higher income households on average reported having more vehicles than lower income households. For example, high-income households had an average of 2 vehicles compared to less than 1 vehicle per low-income household (Figure 9.7).

We also found that households comprising couples with children on average had more vehicles than other household types (Figure 9.8). These finding are related because, as discussed in Chapter 7, the higher income groups comprise a higher proportion of couples with children and a lower proportion of 1 person households.[94]

[94] Specifically, 11% of low-income households were couples with children compared to 30% of the lower middle-income households, 51% of upper middle-income households 60% of high-income households. Conversely, 48% of low-income households were 1 person households compared to 22% of the lower middle-income households, 13% of upper middle-income households 6% of high-income households (See Appendix E, Table 1).

Figure 9.7 Average number of registered vehicles by income, Sydney (2010)

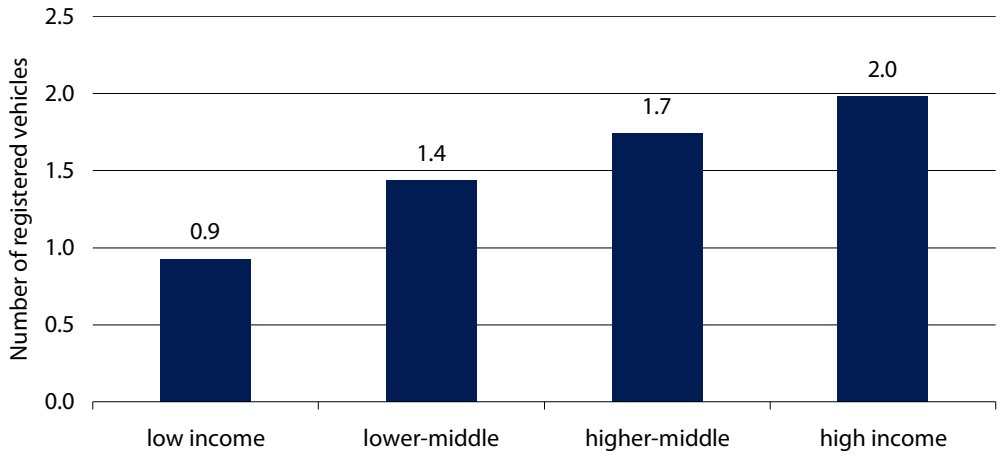
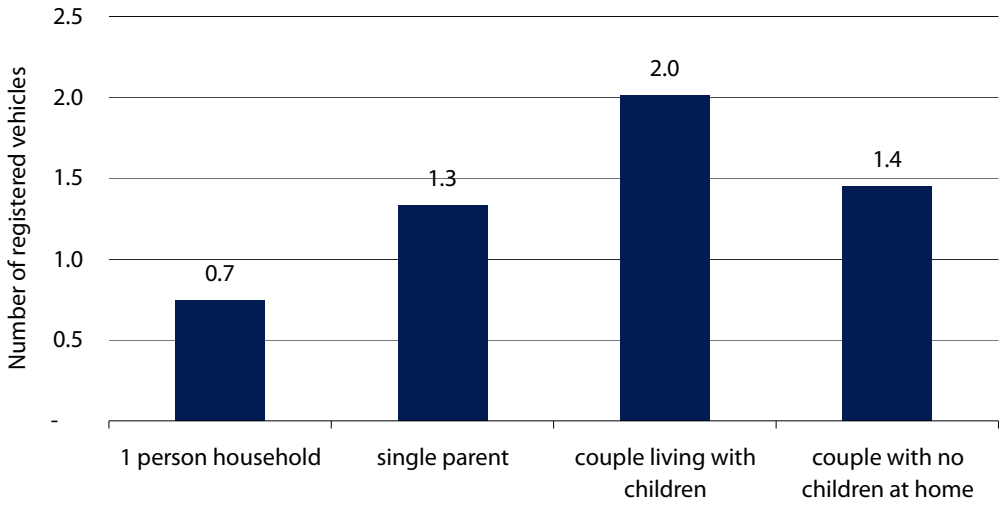


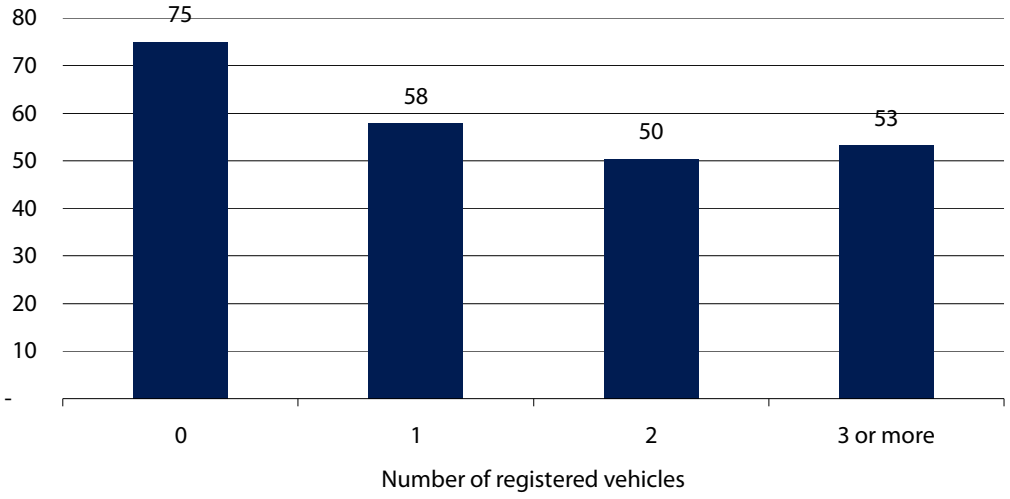
Figure 9.8 Average number of registered vehicles by household structure, Sydney (2010)



9.5.2 Private vehicles and public transport use

We found that a higher proportion of households that did not have regular access to a private vehicle had used a bus, train and/or ferry in the previous 7 days as fare-paying passengers (75% compared to 58% or less of household that had regular access to at least 1 registered vehicle. However, more than 50% of households that did have regular access to 1 or more private vehicles also used public transport (bus, train and/or ferry as paying passengers). This suggests that access to a private vehicle is only one of many factors that determine public transport use in Sydney. (Figure 9.9)

Figure 9.9 Proportion of households that had used a bus, train and/or ferry in the past 7 days by number of registered vehicles, Sydney (2010) (%)[a]

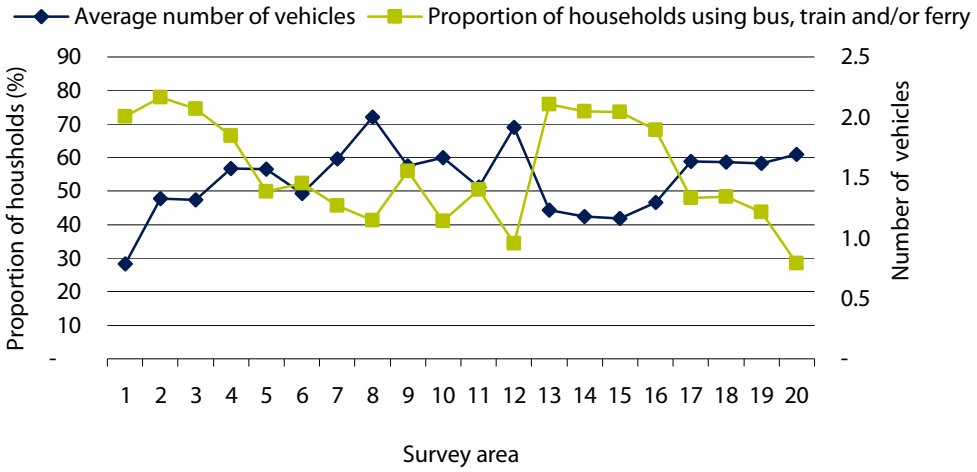


[a] Paying passengers only (ie excluding SSTS).

We also looked at the relationship between public transport use and access to vehicles by survey area, and in general found an inverse relationship: households had more private vehicles in areas where public transport use was low, and fewer private vehicles in areas where public transport use was high. For example:

- 78% of North Sydney to Manly households had used a bus, train and/or ferry and had an average of 1.3 vehicles.
- Only 34% of Campbelltown to Mittagong households had used a bus, train and/or ferry and had an average of 1.9 vehicles.
- City dwellers had fewest vehicles – an average of only 0.8 per household – while 72% had used a bus, train and/or ferry.
- Baulkham Hills to Rouse Hill had the highest average number of vehicles – 2 per household – while 41% had used a bus, train and/or ferry (Figure 9.10).

Figure 9.10 Public transport use compared to average number of registered vehicles per household by survey area, Sydney (2010)[a]



Survey area	area #	Survey area	area #
City	1	Villawood to Cabramatta	11
North Sydney to Manly	2	Campbelltown to Mittagong	12
Concord to Lane Cove	3	Balmain to Strathfield	13
Ryde to Hornsby	4	Eastern Suburbs	14
Collaroy to Palm Beach	5	Botany to Arncliffe	15
North Rocks to Parramatta	6	Lakemba to Hurstville	16
Blacktown to Penrith	7	Sutherland Shire	17
Baulkham Hills to Rouse Hill	8	Blue Mountains	18
Bankstown to Georges Hall	9	Wollongong	19
Liverpool	10	Lake Illawarra	20

a Bus, train and/or ferry including SSTS travel.

We found no significant difference between taxi use and the number of vehicles that a household has access to.

10 Participation in the competitive electricity and gas markets

Full retail competition (FRC) for energy supply was introduced in NSW on 1 January 2002. From that time, all residential energy consumers have had the option to choose their electricity and gas retailer.[95] However, residential customers are still uncertain about many aspects of the competitive market.

To help us understand the development of retail competition in Sydney's residential energy market in recent year, we asked respondents similar questions about this market as we did in the 2006 survey. These included whether **they were aware they can choose their retailer, if they had been offered a market contract by an existing retailer or an alternative retailer, and whether they had accepted a competitive market offer**. We also asked respondents to give their reason for accepting a market offer or choosing to maintain their existing arrangements. In addition, we asked some questions about how households are experiencing full retail competition, and about their knowledge of other retailers, similar to the questions we asked in the 2008 survey.

Our main findings on the extent of competition in the Sydney retail energy market in 2010 are as follows:

- Most respondents were aware that they could choose their electricity or gas retailer. But surprisingly, the proportion of households that knew they could choose their gas retailer was significantly lower in 2010 than in 2006 (77% compared to 94%).
- The Sydney market is still dominated by the pre-FRC electricity retailers (EnergyAustralia and Integral Energy) and the pre-FRC gas retailer (AGL), although each of these retailers has lost about 5% of market share since 2006.
- There seems to have been less activity in the Sydney market in the 3 years prior to the 2010 survey than in the 4 years prior to the 2006 survey, particularly in the gas market:

[95] Households can also stay on a regulated tariff with their pre-FRC supplier. EnergyAustralia and Integral Energy are the pre-FRC electricity suppliers in Sydney and EnergyAustralia is the pre-FRC electricity supplier in the Hunter, Gosford and Wyong areas. AGL is the pre-FRC supplier in both survey regions.

  - Far fewer households entered a market contract with their existing electricity retailer between 2007 and 2010 (8%, compared to 24% between 2002 and 2006). Similar proportions of households were approached about entering market contracts during the 2 periods (about 75%). The only increase in activity has been in the proportion of households who changed their electricity retailer (18% between 2002 and 2006 and 23% between 2007 and 2010).
  - Far fewer households with mains gas were approached about gas contracts between 2007 and 2010 than between 2002 and 2006 (33% compared to 61%). Also, fewer households entered a market contract with their existing gas retailer in the 2007 to 2010 period (4% compared to 16%). The level of switching to another retailer following an approach to switch was low in both periods (about 8%).

- Since January 2002, 42% of households had switched their electricity retailer, and 24% of households with mains gas had switched their gas retailer for any reason other than moving house. Most of these households had switched retailers only once, and very few had switched more than twice.
- Only a very small proportion of respondents said they had actively approached an energy retailer about entering into a contract.
- Of households that had accepted an offer to enter into a contract, most said their main reason was that they believed it was cheaper. However, less than 30% of Sydney households felt that their bills were lower as a consequence of going onto a contract.
- Of households that had not entered into a contract, the most common reason was that they were happy with their existing arrangements.
- There was more dissatisfaction with contracts among Sydney households in 2010 than Hunter, Gosford and Wyong households in 2008.
- Residential customers appear to be fairly confident in their ability to choose a retailer, a little less confident that they have the information they need, and least confident about the process of transferring.
- When asked, most respondents said they would go directly to their retailer if they had a problem or complaint about the retailer.

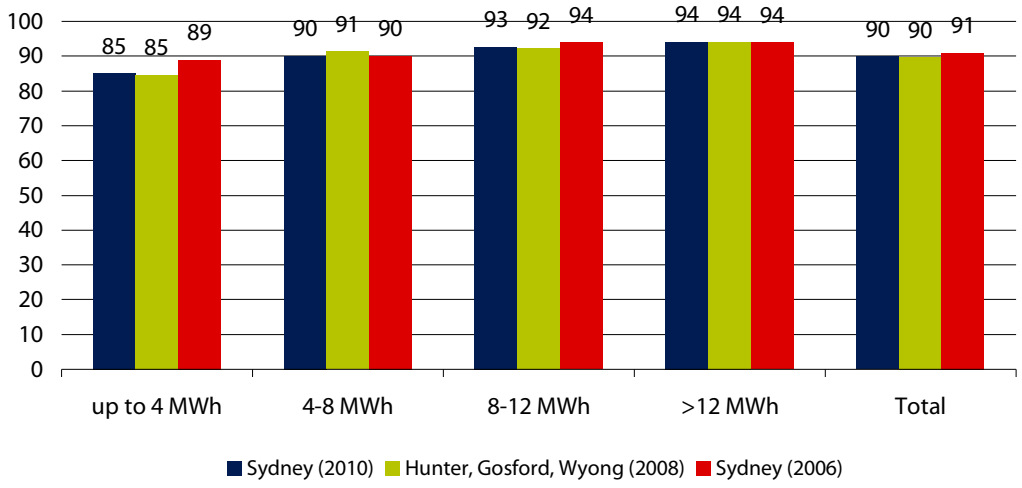
10.1 Awareness of competition in the retail electricity and gas markets

To help understand the level of awareness about competition in the energy markets, we first asked respondents whether they were aware that they could choose their electricity and gas retailer. In the 2010 survey we also asked respondents how many other retailers they thought they could be supplied by (ie, other than their current retailer).

10.1.1 Awareness of competition in the retail electricity market

Most respondents in both Sydney and the Hunter, Gosford and Wyong areas were aware they could choose their electricity retailer (90% or more of households). The level of awareness in Sydney was virtually the same in 2010 as in 2006. It was also fairly similar among households with different consumption levels, although the proportion of small users (up to 4 MWh per year) that were aware of this ability was slightly smaller than that of medium and large users (Figure 10.1).

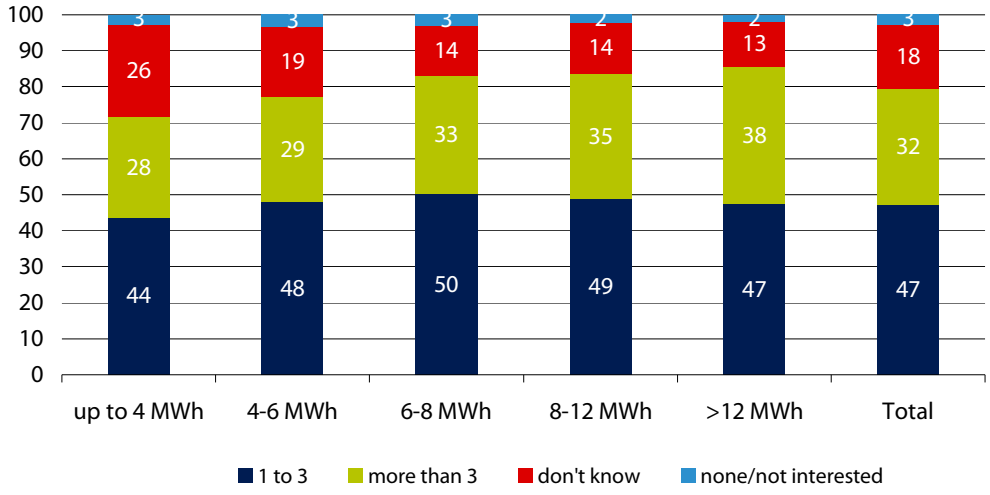
Figure 10.1 Proportion of respondents who were aware that they could choose their electricity retailer, by consumption (%)



However, a minority of respondents were aware of the number of potential electricity retailers they could choose from. There were about 10 retail electricity companies operating in the Sydney area at the time of the 2010 survey, but only 32% of respondents thought they could be supplied by more than 3 other companies[96] (Figure 10.2). This finding suggests that customers have only limited information about the retail electricity market. This issue is discussed further in section 10.8 below.

96 That is, companies other than their current retailer.

Figure 10.2 Proportion of respondents who thought they could be supplied by more or less than 3 other electricity retailers, by consumption, Sydney (2010) (%)



Note: Only households that said they are aware they can choose their retailer are included.

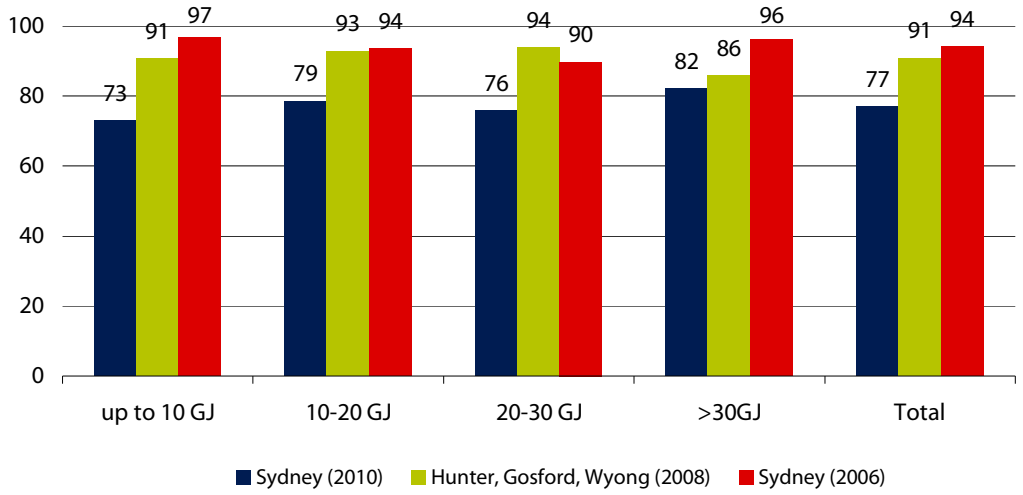
10.1.2 Awareness of competition in the retail gas market

Only three quarters of respondents who were connected to mains gas were aware they can choose their gas retailer (Figure 10.3). This proportion was lower than in the 2006 Sydney survey and the 2008 Hunter, Gosford and Wyong survey (more than 90%). It was also lower than the proportion of respondents who were aware they can choose their electricity retailer in the 2010 survey (90% or more, as discussed above).

The reasons for this lower level of awareness of competition in the Sydney gas market are unclear.

As Figure 10.3 shows, there does not appear to be a strong relationship between the level of awareness and the level of gas consumption.

Figure 10.3 Proportion of respondents who were aware that they could choose their gas retailer, by consumption[a,b] (%)

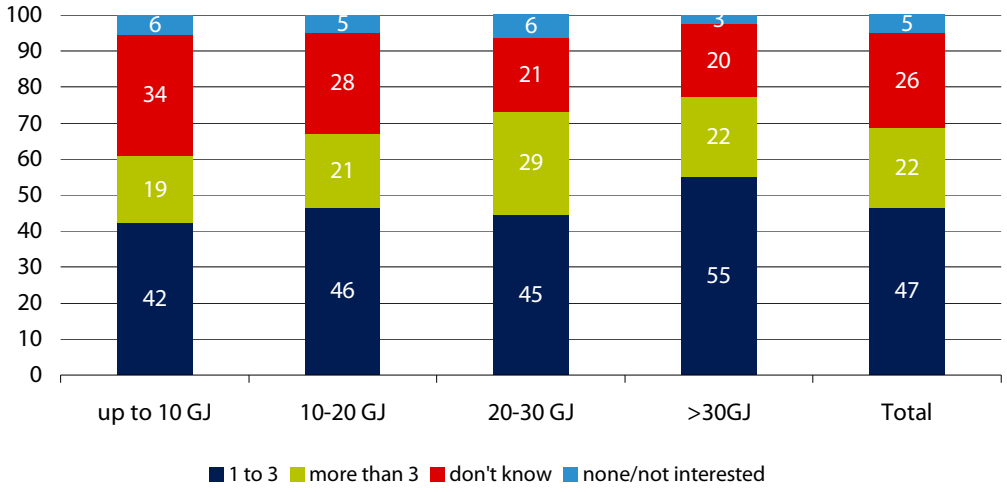


a Only households with mains gas are included.

b The Hunter, Gosford and Wyong data for the .30GJ category needs to be interpreted with caution due to the small number of observations.

About a third of respondents who were connected to mains gas in Sydney (2010) and were aware they could choose their retailer were uncertain or not interested in how many other gas companies could they could be supplied by. This is more than the proportion of households who were aware they could choose their electricity retailer and were uncertain or not interested on how many other electricity companies they could be supplied by (21%). This finding suggests that households in Sydney know even less about the gas market than they do about the electricity market (Figure 10.4).

Figure 10.4 Proportion of respondents who thought they could be supplied by more or less than 3 other gas retailers, by consumption, Sydney (2010) (%)



Note: Only households with mains gas that said they are aware they can choose their retailer are included.

10.2 Market share of alternative retailers

The 2006, 2008 and 2010 surveys asked respondents to identify their current electricity and gas retailers. To shed some light on what has happened to market shares in Sydney since 2006, we compared the proportion of respondents who were supplied by the different retailers. We also looked at the relative market shares of the pre-FRC retailer (EnergyAustralia) and the alternative retailers in the Hunter, Gosford and Wyong areas.

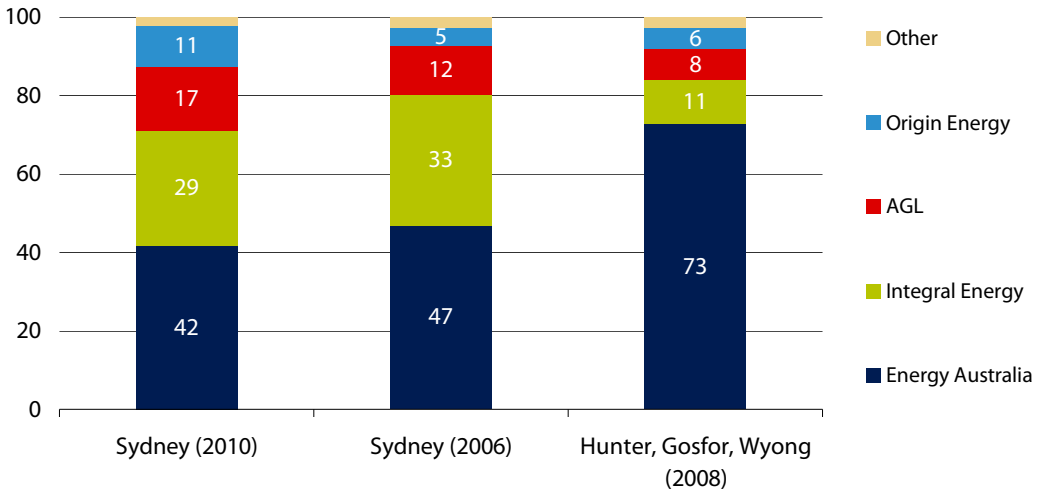
10.2.1 Market share of alternative electricity retailers

Our 2010 survey data for the Sydney area indicate that the pre-FRC retailers (EnergyAustralia and Integral Energy) remain the dominant electricity retailers in the Sydney area. In 2010, EnergyAustralia was the retailer for 42% of respondents and Integral Energy was the retailer 29% of respondents. But our survey data also suggest that each of these retailers has lost between 4% and 5% of market since 2006. The companies that gained the most market share between 2006 and 2010 were AGL (17%, up from 12%) and Origin Energy (11%, up from 5%) (Figure 10.5).

The 2008 survey data for the Hunter, Gosford and Wyong areas indicate that the pre-FRC retailer in those areas (EnergyAustralia) was still by far the dominant retailer, with 73% market share. The next largest retailers were Integral Energy (11%) and AGL (8%).

Comparing the 2 survey regions, our data indicate that the pre-FRC retailers were the retailers for just over 70% of households in both regions.

Figure 10.5 Proportion of households supplied by the different electricity retailers (%)

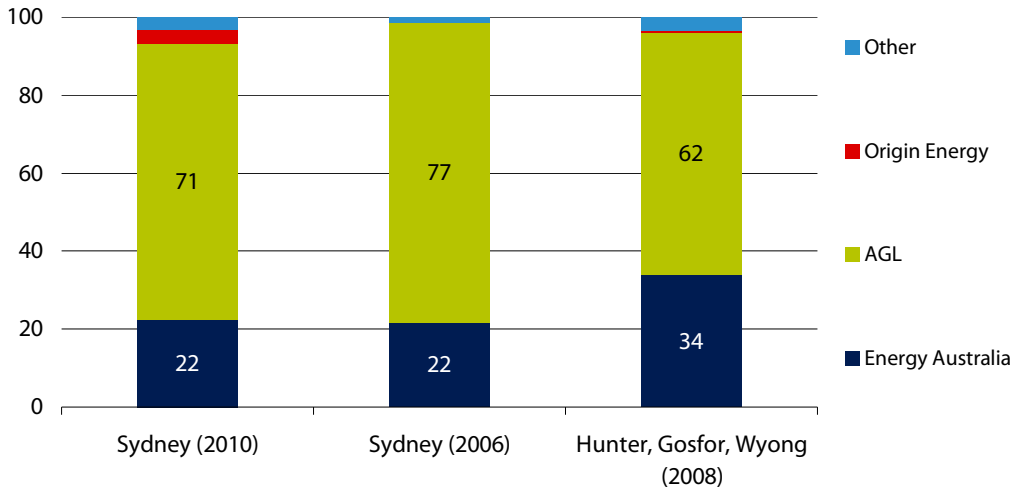


10.2.2 Market share of alternative gas retailers

AGL is the pre-FRC gas retailer for both the Sydney and Hunter, Gosford and Wyong survey regions. Our survey data indicate that, while this retailer is still by far the dominant retailer in Sydney (with 71% market share), it lost about 6% of market share between 2006 and 2010. Over this period, EnergyAustralia's share remained stable (22%), and AGL's lost market share was taken up by Origin Energy and other retailers (Figure 10.6).

AGL was also still the dominant retailer in the Hunter, Gosford and Wyong areas (with 62% market share). However, EnergyAustralia seems to have captured a larger share of this market than (34% in the Hunter, Gosford and Wyong areas compared to 22% in Sydney) (Figure 10.6).

Figure 10.6 Proportion of households supplied by the different gas retailers (%)



10.3 Level of activity in the retail electricity market

We assessed the level of activity in the retail electricity market by looking at the proportion of households that had been approached to enter into a market contract, either with their existing retailer or with an alterative retailer. We also asked respondents whether they had actively approached an electricity retailer themselves. We then looked at the proportion of households that had switched retailer following an approach, and the proportion of households that had entered into a market contract with their existing retailer (ie, that had entered into a market contract without switching retailer).

Box 10.1 explains how the 2010 survey asked respondents about accepting market offers, and how we have interpreted their responses.

Box 10.1 How the 2010 survey asked about entering into market contracts

An important purpose of our surveys is to find out how many households have entered into market contracts, either with their existing retailer or with another retailer. However, during the pilot survey it became apparent that people are confused by the term 'contract', and do not understand the difference between a contract and buying gas/electricity on a regulated tariff. To avoid these terminology problems, the main 2010 survey asked respondents whether they had:

1. entered into new arrangements with their existing retailer, or
2. changed retailer.

The intention of question 1 was to establish whether the customer had entered into a market contract without changing their retailer. The intention of question 2 was to establish whether the customer had entered into a market contract with a different retailer (ie had switched).

Does 'changing tariff arrangements with your existing retailer' mean entering into a market contract with that retailer?

'Entering into new arrangements with your existing retailer' is most likely to mean entering into a market contract with that retailer, but it also captures households that changed their arrangements for a different reason. For example, some households may have been put onto a time-of-use tariff following the installation of a smart meter, and therefore answered 'yes' to the question. However, the responses given by participants about why they changed their arrangements (see Section 10.5) suggests that, for the vast majority of households, 'changing tariff arrangements with an existing retailer' meant entering into a market contract with that retailer.

Therefore, for the purposes of this report we have assumed that 'changing tariff arrangements with an existing retailer' is the same as 'entering into a market contract with an existing retailer'.

Does 'changing your retailer 'mean entering into a market contract with a new retailer?

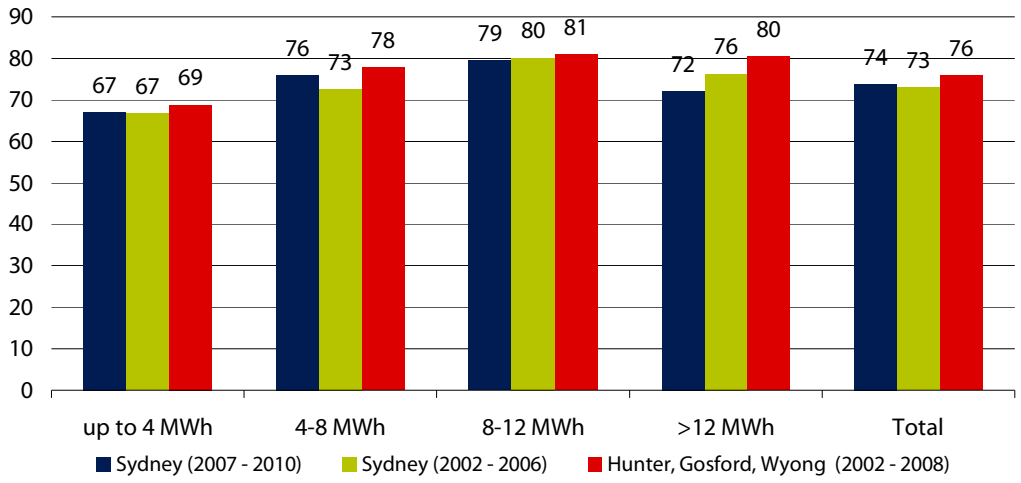
Changing to a different retailer usually means entering into a market contract with that retailer, but it can occur for other reasons. For example if a retailer fails, the affected customers are automatically transferred to the area's pre-FRC retailer. (In our survey about 1% of respondents who had changed their retailer had been automatically transferred because the retailer Jack Green had failed.) However, in the vast majority of cases, 'changing retailers' means accepting a competitive offer. Therefore, for the purposes of this report, we have assumed that 'changing a retailer' is the same as 'entering into a market contract with an alternative retailer'

10.3.1 Proportion of households approached to switch electricity retailer or enter into a contract with their existing retailer

The 2010 survey found that in the 3 years prior to the survey, 74% of respondents had been approached by an electricity retailer to switch retailer and/or to enter into a contract with their existing retailer. This is very similar to the proportion of respondents that had been approached between 2002 and 2006 (73%, Sydney 2006), and between 2002 and 2008 (76%, Hunter, Gosford and Wyong 2008). In both survey

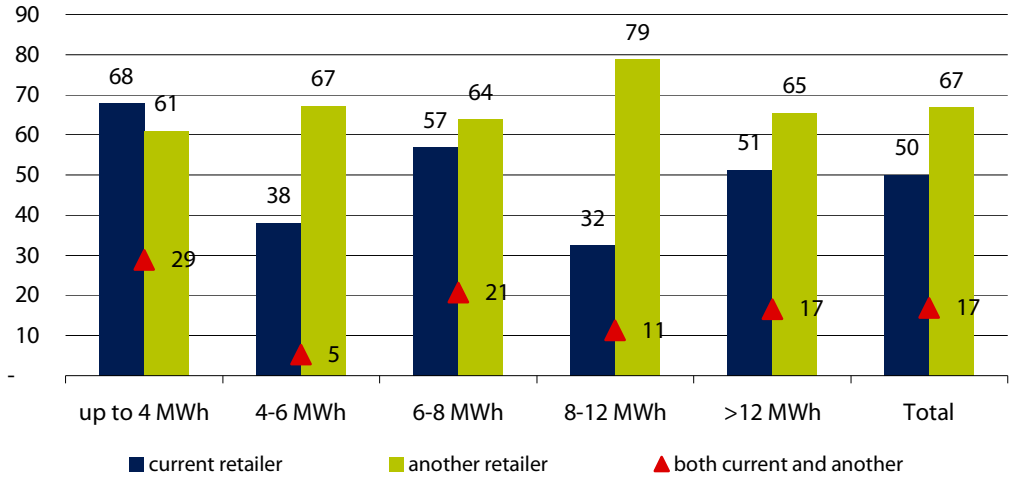
regions, households using less than 4 MWh per year were somewhat less likely to have been approached than larger users (Figure 10.7).

Figure 10.7 Proportion of households approached by an electricity retailer to switch retailer or enter into a contract, by electricity consumption (%)



Of the Sydney households that were approached during the period 2007 to 2010, 50% had been approached by the retailer they were with at the time of the survey, and 67% has been approached by a different retailer. Included in these figures are the 17% of households that had been approached by both a different retailer and the one they were with at the time of the survey (Figure 10.8).

Figure 10.8 Proportion of households approached by current or another electricity retailer, Sydney (2010) (%)[a]



a Expressed as a proportion of households that were approached.

10.3.2 Proportion of households that had approached an electricity retailer themselves

Only 6% of households in Sydney had approached an electricity retailer between 2007 and 2010. This is similar to the finding of the 2008 survey in the Hunter, Gosford and Wyong areas, where only 7% of electricity customers had approached a retailer between 2002 and 2008.

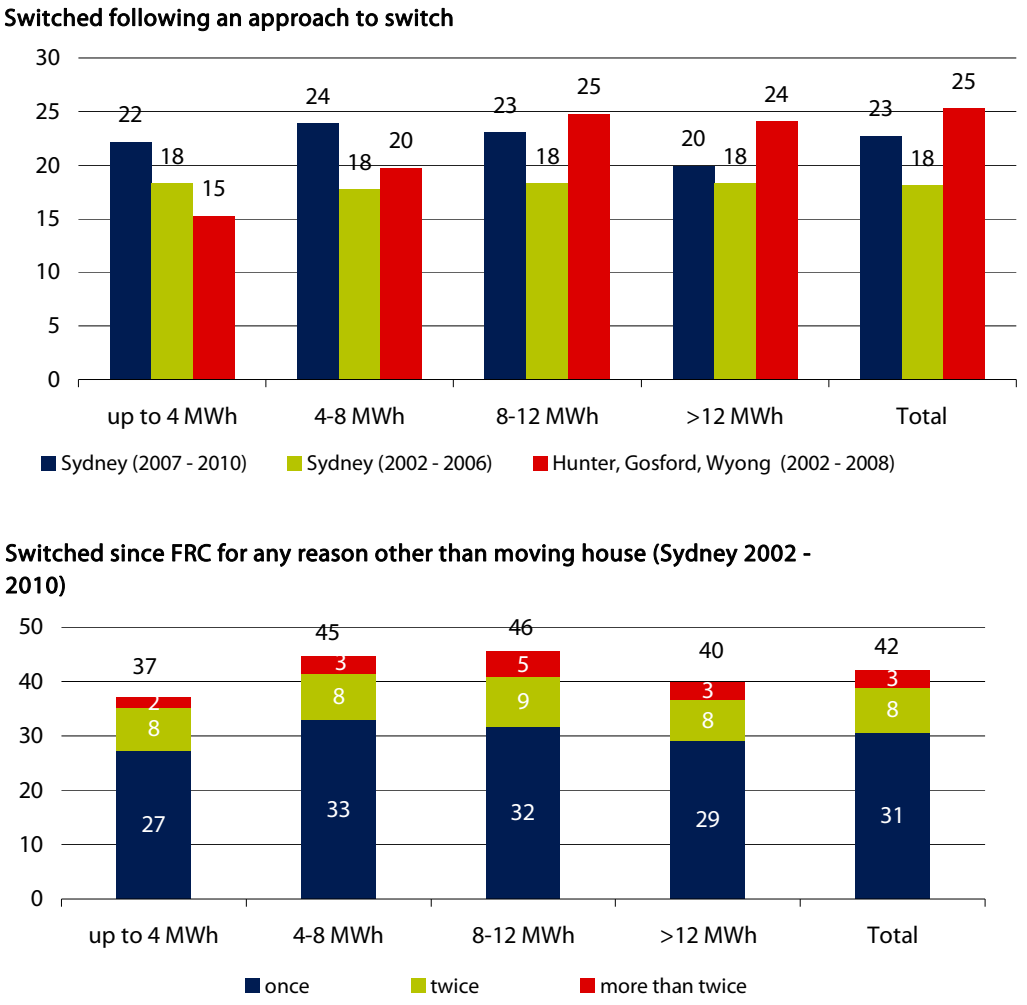
10.3.3 Proportion of households that had switched electricity retailers

The 2010 survey found that 23% of all household in Sydney had switched electricity retailer in the 3-year from 2007 to 2010 following an approach.[97] This is slightly higher than the proportion that had switched in the 4-year period prior to the 2006 survey (18%), but slightly lower than proportion of households in the Hunter, Gosford and Wyong areas that had switched in the 6-year prior to the 2008 survey (25%) (Figure 10.9).

The 2010 survey also found that 42% of all households in Sydney had switched electricity retailer at least once since the introduction of FRC in January 2002, for a reason other moving house. Of those households, most had switched only once and very few had switched more than twice (Figure 10.9).

[97] Some respondents seem to have been confused about the distinction between a 'current' and an 'existing' supplier ('Current' was intended to indicate at the time of the survey, and 'existing' was the supplier at the time of an approach by a supplier). Because of this, we were unable to calculate the proportion of respondents who had switched their supplier as a proportion of those who had been approached *to switch*.

Figure 10.9 Proportion of households that had switched electricity retailer[a] (%)



a Households who switched as a proportion of all households (not just households who had been approached to switch).

Looking at switching by electricity consumption, we found there was little difference in switching behavior following an approach between small and large electricity users in Sydney. However, smaller electricity users in the Hunter, Gosford and Wyong areas were somewhat less likely to have switched following an approach than larger users (Figure 10.9).

10.3.4 Proportion of households that had entered into a market contract with their existing electricity retailer

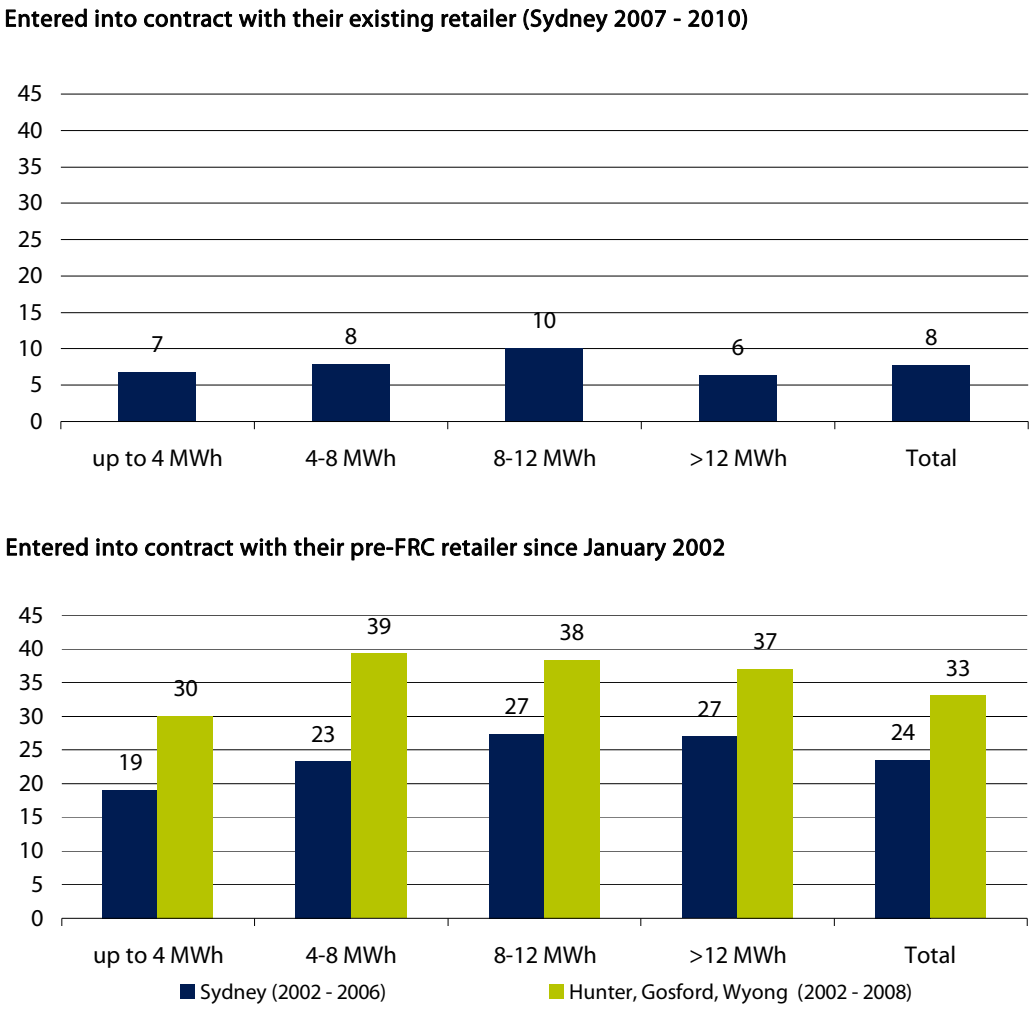
Compared to the proportion of Sydney households that had switched electricity retailer in the 3 years prior to the 2010 survey (23%), a far smaller proportion of households indicated that they had entered into a contract with their existing retailer (8%). Similar proportions of small and large electricity users had entered into contracts with their existing retailer (Figure 10.10).

This finding cannot be directly compared with those for the 2006 and 2008 surveys, because these previous surveys asked a slightly different question: they asked whether households had *ever* entered into a contract with their *pre-FRC* retailer, whereas the 2010 survey asked whether they had entered into a contract with their existing retailer in the 3 years prior to the survey.[98] Therefore, the 2006 and 2008 surveys exclude households that may have entered into a new contract with an existing retailer who was not a pre-FRC retailer. In addition, the 2008 survey in particular covers a longer time period than the 2010 survey (6 years compared to 3 years).

Nevertheless, the findings of the 3 surveys suggest that households were more likely to have entered into a contract with an existing retailer in the early years of FRC (when their existing retailer was more likely to have been their pre-FRC retailer). For example, 23% of Sydney respondents indicated they had entered into a contract with their pre-FRC retailer between 2002 and 2006, while only 8% said they had entered into a contract with their existing retailer in the 3 years prior to the 2010 survey (Figure 10.10).

[98] EnergyAustralia is the pre-FRC supplier in the Hunter, Gosford and Wyong areas and in its network area in Sydney (roughly eastern Sydney). Intergral Energy is the pre-FRC supplier in its network area in Sydney (roughly western Sydney).

Figure 10.10 Proportion of households that had entered into contracts with their existing electricity retailers (%)[a]



10.4 Level of activity in the retail gas market

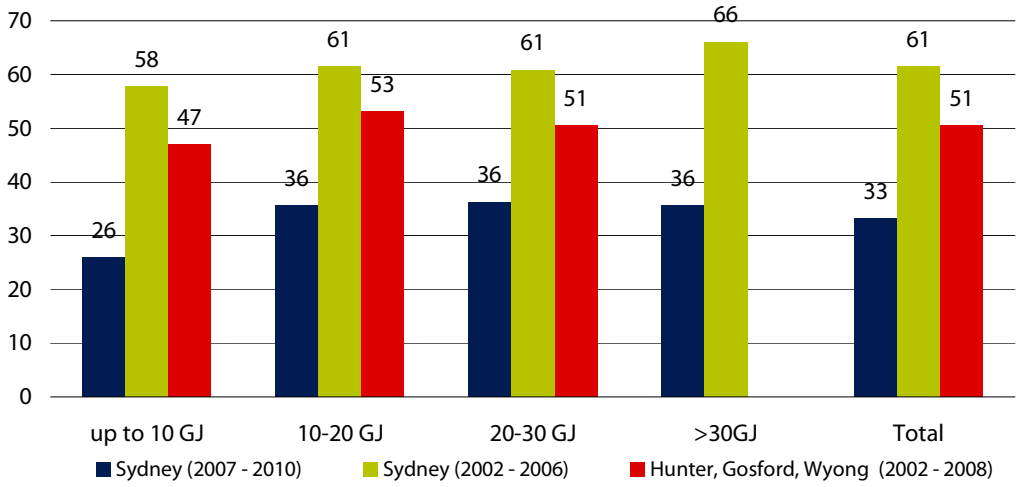
As for the electricity market, we assessed the level of activity in the gas retail market by looking at the proportion of households that had been approached to enter into a market contract, either with their existing gas retailer or with an alterative gas retailer. We also asked respondents whether they had actively approached a gas retailer themselves. Then we looked at the proportion of households that had switched their gas retailer following an approach, and the proportion of households that had entered into a market contract with their existing retailer.

Note that in this section, only households that were connected to mains gas are included in the analysis.

10.4.1 Proportion of households approached to switch gas retailer or enter into a contract with their existing gas retailer

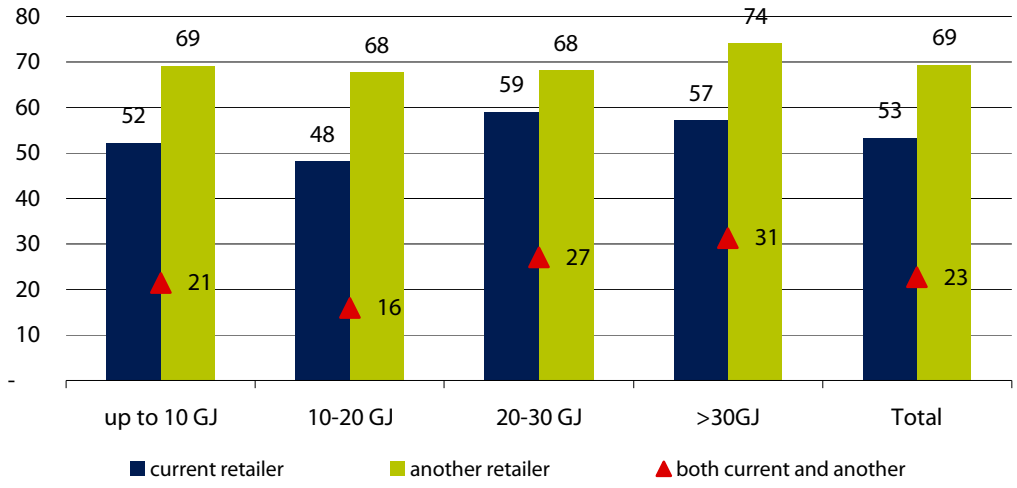
Our 2010 survey data indicates that, in the 3 years prior to survey, only 33% of respondents had been approached by a gas retailer to switch retailer and/or enter into a contract with their existing retailer. This is far lower than the proportion of respondents that were approached by an electricity retailer (74%, see Figure 10.7 in section 10.3). It is also lower than the proportions that had been approached by a gas retailer prior to the 2006 survey, and the 2008 survey (Figure 10.11).

Figure 10.11 Proportion of households approached by any gas retailer to switch or enter a contract, by gas consumption (%)



Of the Sydney households that were approached during a 3 year period between 2007 and 2010, around half had been approached by their current retailer at the time of the survey and 69% has been approached by a different gas retailer. Included in these proportions are the 23% of households that had been approached by both their current retailer and a different retailer (Figure 10.12). These proportions are fairly similar to those in relation to electricity retailers (Figure 10.8), although a slightly higher proportion of households had been approached by both their current and different gas retailers (23% compared to 17%).

Figure 10.12 Proportion of households approached by their current or another gas retailer, Sydney (2010) (%)[a]



a Expressed as a proportion of households that were approached.

10.4.2 Proportion of households that had approached a gas retailer themselves

The 2010 survey also asked respondents whether they had actively approached a gas retailer in the previous 3 years to ask about buying gas from them. Like for electricity, only a small proportion had (4%). This is similar to the findings of the 2008 survey in the Hunter, Gosford and Wyong areas, where only 7% of gas customers had approached a gas retailer between 2002 and 2008.

10.4.3 Proportion of households that had switched gas retailers

We asked households whether they had switched their gas retailer in the 3 years prior to the 2010 survey as a consequence of an approach by a retailer. We found that only a small proportion had (9% of all households with mains gas, compared to 23% of households that had switched their electricity retailer following an approach).[99] The 2006 Sydney survey found a similarly small proportion of households had switched to a retailer other then their pre-FRC retailer (AGL) in the period 2002 to 2006 (7%) (Figure 10.13).

The Hunter, Gosford and Wyong 2008 survey suggests that switching to another gas retailer has been more common in those areas than in Sydney. This survey found that 20% of households had switched to another gas retailer (mostly EnergyAustralia) following an approach between 2002 and 2008. The differences in switching behavior between the survey regions explains why AGL had a larger

99 Like for electricity, we were unable to calculate the households that had switched their supplier as a proportion of those that had been approach to switch.

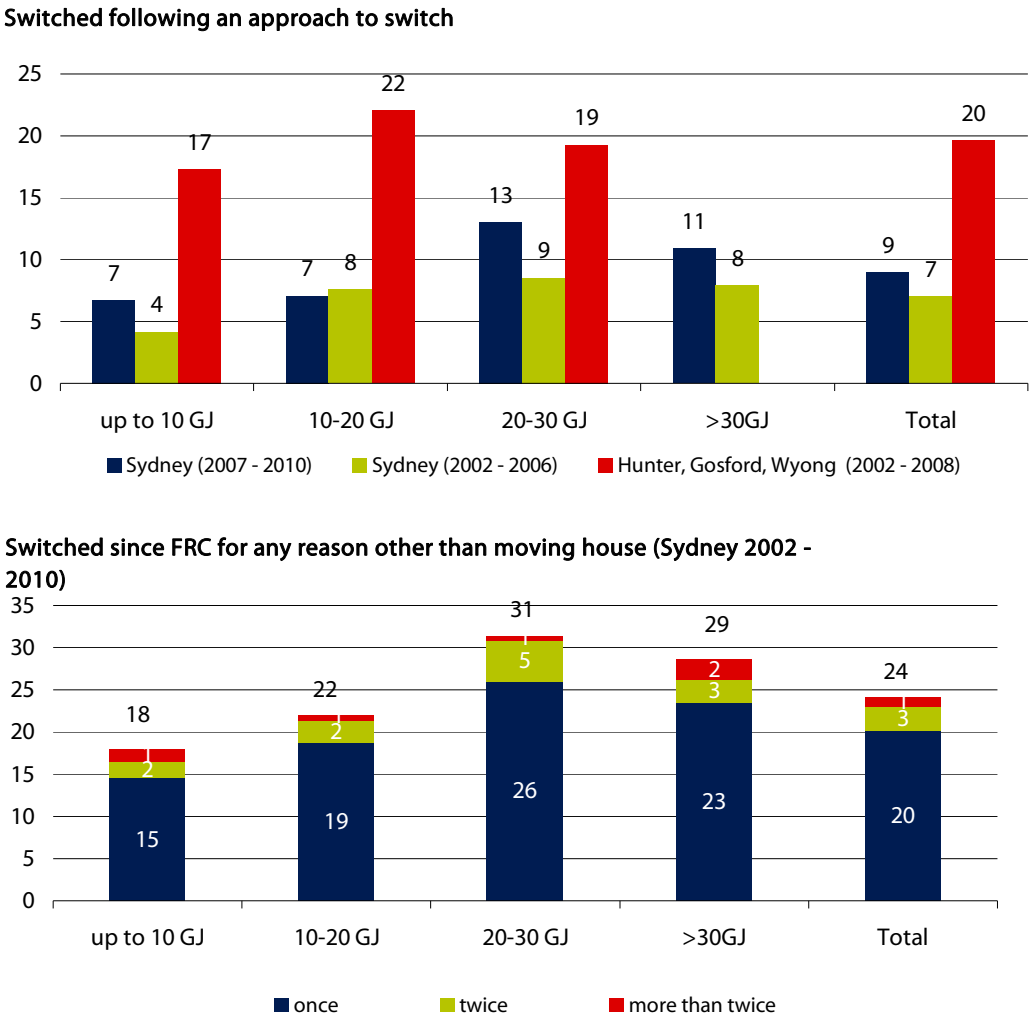
market share in Sydney in 2010 than in the Hunter, Gosford and Wyong areas (71% compared to 62% - see Figure 10.6).

Our 2010 Sydney survey also asked households whether they had changed their gas retailer since the introduction of FRC in January 2002, for any reason except moving house. About a quarter (24%) of respondents said they had switched at least once. Again, this was significantly lower than proportion of respondents that had switched their electricity retailer (42%). As for electricity, most of these respondents had switched only once (Figure 10.13).[100]

Looking at switching by gas consumption, households using less than 20 GJ of gas per year were less likely to have switched than households using more gas. In the Hunter, Gosford and Wyong areas there was little difference in switching behavior (following an approach) between small and large gas users (Figure 10.13).

[100] Our survey data show that a significantly larger proportion of households said they had switched at least once since 2002 (24%) than the sum of the proportions who said they had switched as a consequence of an approach to switch during the periods 2002 to 2006 and 2007/08 to 2009/10 (9%+7% = 16%). This suggests that a large proportion of those households that had switched during the period 2002 to 2010 (8%) had done so for reasons other than an approach to switch their gas retailer, possibly as a consequence of a decision to switch their electricity retailer (while keeping a single retailer for both services).

Figure 10.13 Proportion of households that had switched gas retailers[a] (%)



a Households who switched as a proportion of all households with mains gas (not just households who had been approached to switch).

Note: Very few households in the Hunter, Gosford and Wyong areas used more than 30 GJ of gas per year. These households are included in the 20 to 30 GJ per year category.

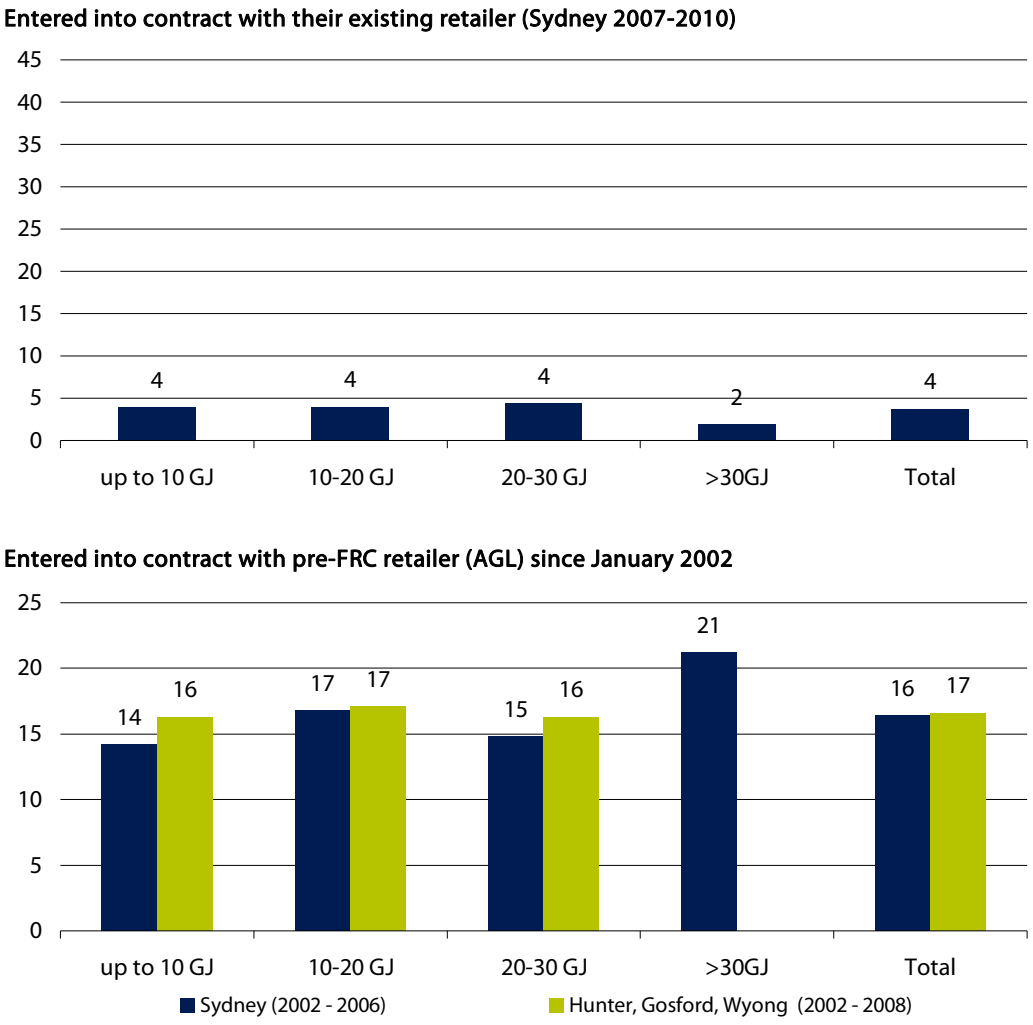
10.4.4 Proportion of households that had entered into a contract with their existing gas retailer

An even smaller proportion of households in Sydney had entered into a contract with their existing retailer than had switched retailer as a result of an approach (4% compared to 9%). Similar proportions of small and large gas users had entered into contracts with their existing retailer (Figure 10.14).

Like for electricity, households were more likely to have entered into a contract with their pre-FRC retailer (AGL) in the early years of FRC than to have entered into a contract with their existing retailer in the 3 years prior to the 2010 survey. During the

period 2002 to 2006, 16% of respondents in Sydney had entered into a contract with AGL, as had 17% of respondents in the Hunter, Gosford and Wyong areas between 2002 and 2008. This is significantly more than the approximately 4% of customers who had entered into a contract with their existing retailer in the 3 years prior to the 2010 survey (Figure 10.14).

Figure 10.14 Proportion of households that had entered into contracts their existing gas retailer (%)



Note: Very few households in the Hunter, Gosford and Wyong areas used more than 30 GJ of gas per year. These households are included in the 20 to 30 GJ per year category.

10.5 Reasons for choosing to enter into a market contract

Most commonly, the main reason households gave for their decision to enter into a contract with an electricity retailer (either their existing or an alternative retailer) was because it was cheaper. Some 63% to 65% of respondents to the Sydney surveys gave this as the main reason in 2010 and 2006. A slightly higher proportion of respondents to the Hunter, Gosford and Wyong survey gave this as the main reason in 2008 (68%).

Other main reasons given by Sydney households in 2010 include:

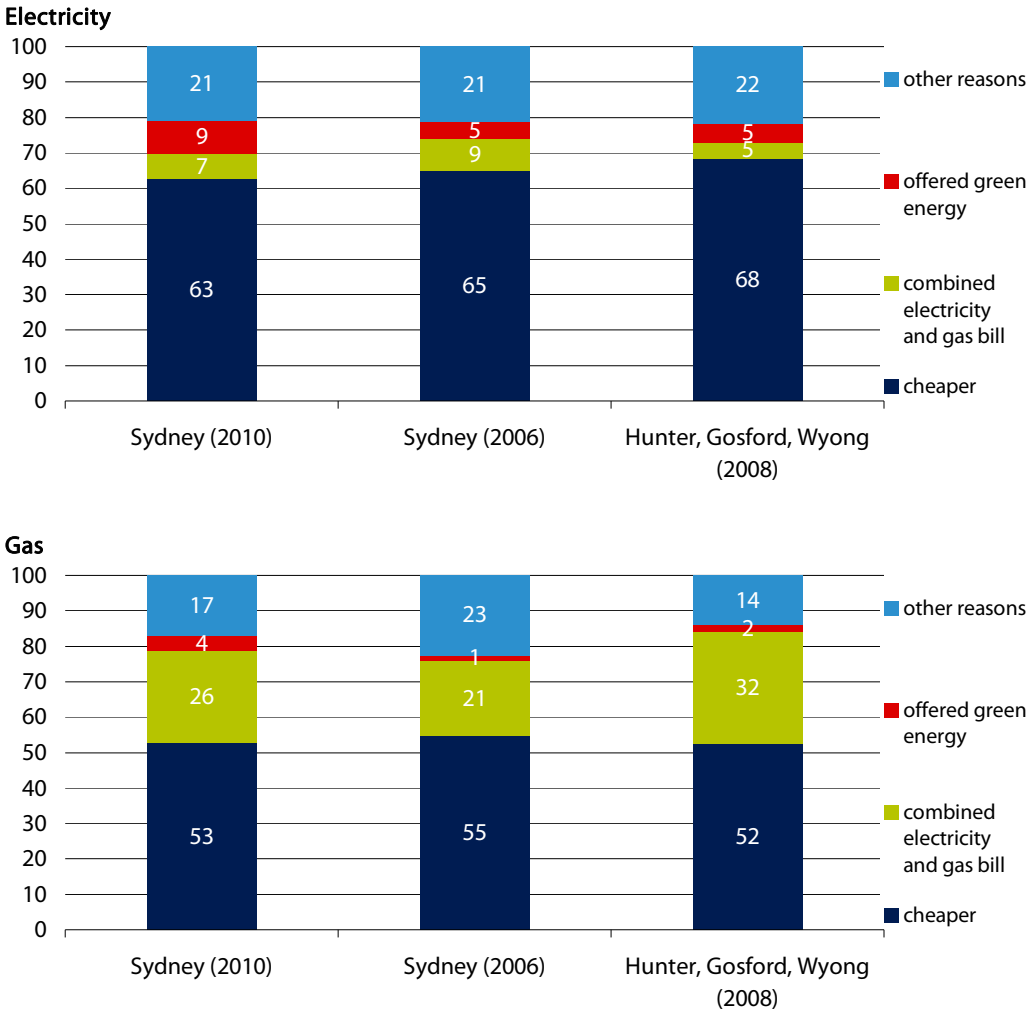
- the retailer offered green energy (9%)
- the retailer offered a combined electricity and gas bill (7%)
- they were unhappy with their previous retailer (5%)
- the salesperson was persuasive (4%)
- the other retailer offered a better service (4%).

These other reasons are similar to those given by Sydney households in 2006 and Hunter, Gosford and Wyong households in 2008. Possibly the only noteworthy difference is the slight increase in the number of respondents in Sydney who indicated that the main reason they had entered a contract was that the retailer offered green energy (9%, up from 5%) (Figure 10.15.).

Similarly for gas customers, the most commonly given main reason for entering into a contract with a gas retailer was because it was cheaper. Just over half of respondents to all 3 surveys gave this as the main reason. However, a large proportion also said they did so to obtain the benefits of a combined electricity/gas bill (26% in Sydney in 2010, 21% in Sydney in 2006 and 32% in the Hunter, Gosford and Wyong areas). The other main reasons given by households were similar to those given for entering a contract with an electricity retailer, except that fewer gave 'green energy' as the main reason (Figure 10.15).[101]

[101] Appendix A provides a more detailed list of reasons.

Figure 10.15 Reasons for switching retailer or accepting a contract with an existing retailer (% of households)

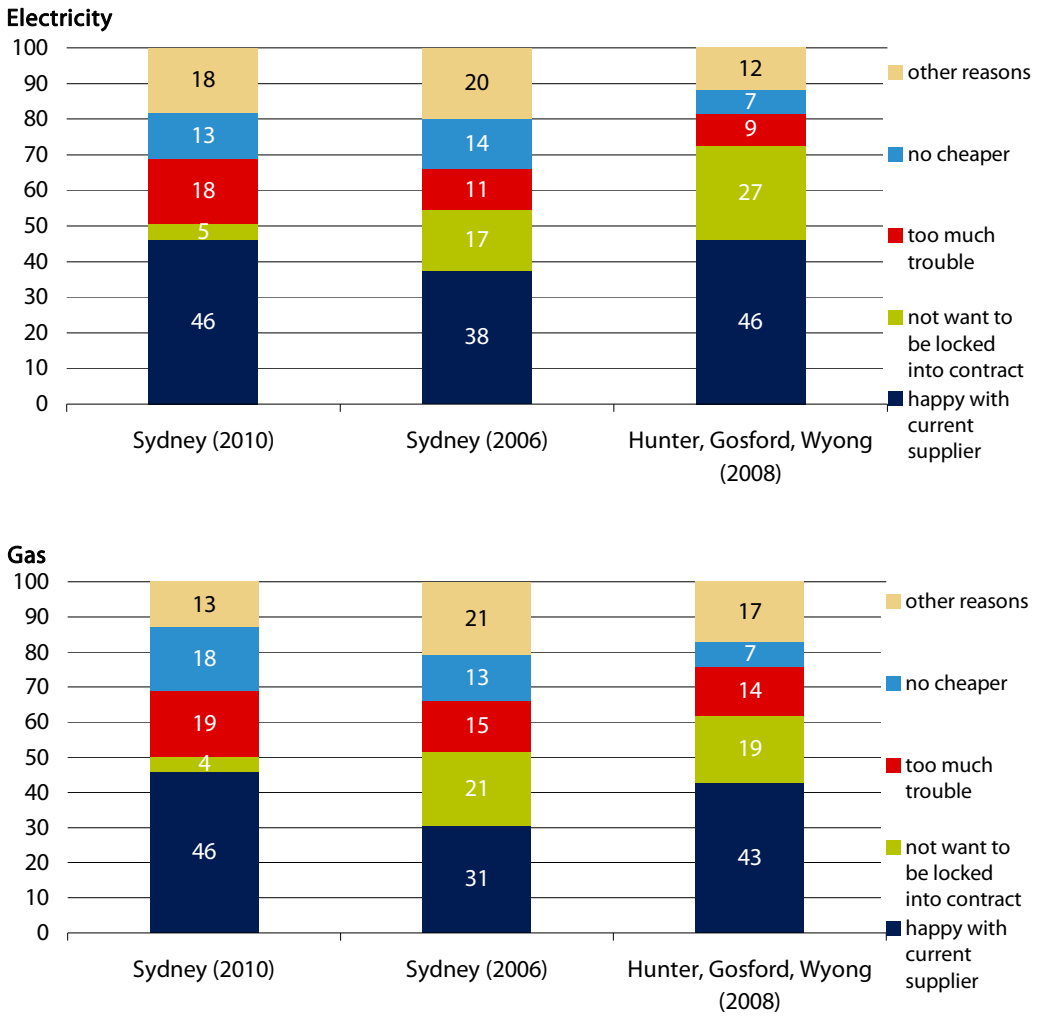


10.6 Reasons for choosing not to enter into a market contract

Of the households that chose not to accept an offer to enter a contract with either their current retailer or with an alternative retailer, the main reasons for this given by Sydney respondents in 2010 were that they:

- were happy with their existing retailer (46% for electricity and for gas)
- thought it was too much trouble to switch (18% for electricity and 19% for gas)
- thought it was no cheaper (13% for electricity and 18% for gas).

Figure 10.16 Reasons for not choosing to accept an offer to enter a contract (% of households)



Comparing the responses of Sydney households in 2010 with those in 2006, the main change is a reduction in the proportion of households that indicated that not wanting to be locked into a contract as the main reason (down from 17% to 5% for electricity contracts, and from 21% to 4% for gas contracts). Instead, a higher proportion of households in 2010 did not change because they saw no good reason to do so (including the reasons 'too much trouble to switch' and 'happy with my current retailer') (Figure 10.16).

Households in the Hunter, Gosford and Wyong areas remained concerned about being locked into a contract (27% for electricity contracts and 19% for gas contracts) (Figure 10.16).

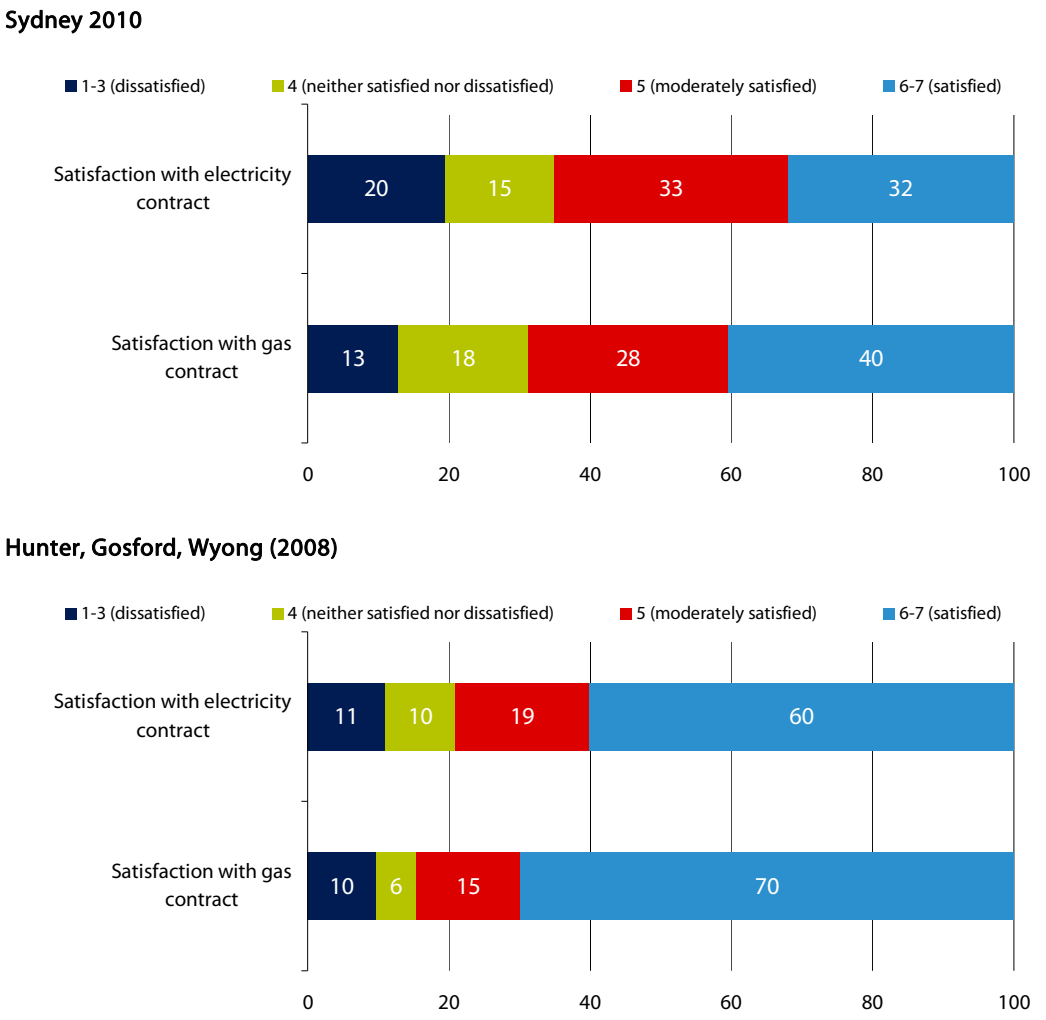
10.7 Satisfaction with new supply arrangements

We asked respondents who had entered into new energy supply arrangements (either with their existing retailer or an alternative retailer) to rate their satisfaction with the arrangements. Specifically, we asked to what extent the new arrangements had met their expectations (on a scale of 1 to 7).

Of those that had changed their electricity arrangements, about 65% of Sydney (2010) households indicated they were satisfied, while 15% said they didn't feel strongly either way, and 20% said they were dissatisfied. There was less dissatisfaction with new gas arrangements, with only 13% saying they were dissatisfied (Figure 10.17).

Households in the Hunter, Gosford and Wyong areas in 2008 generally expressed more satisfaction with their gas and electricity contracts than households in Sydney in 2010. In the former areas, about 80% of households were at least moderately satisfied with their contracts (the Sydney 2006 survey did not ask this question).

Figure 10.17 Satisfaction with electricity and gas contracts (% of households)

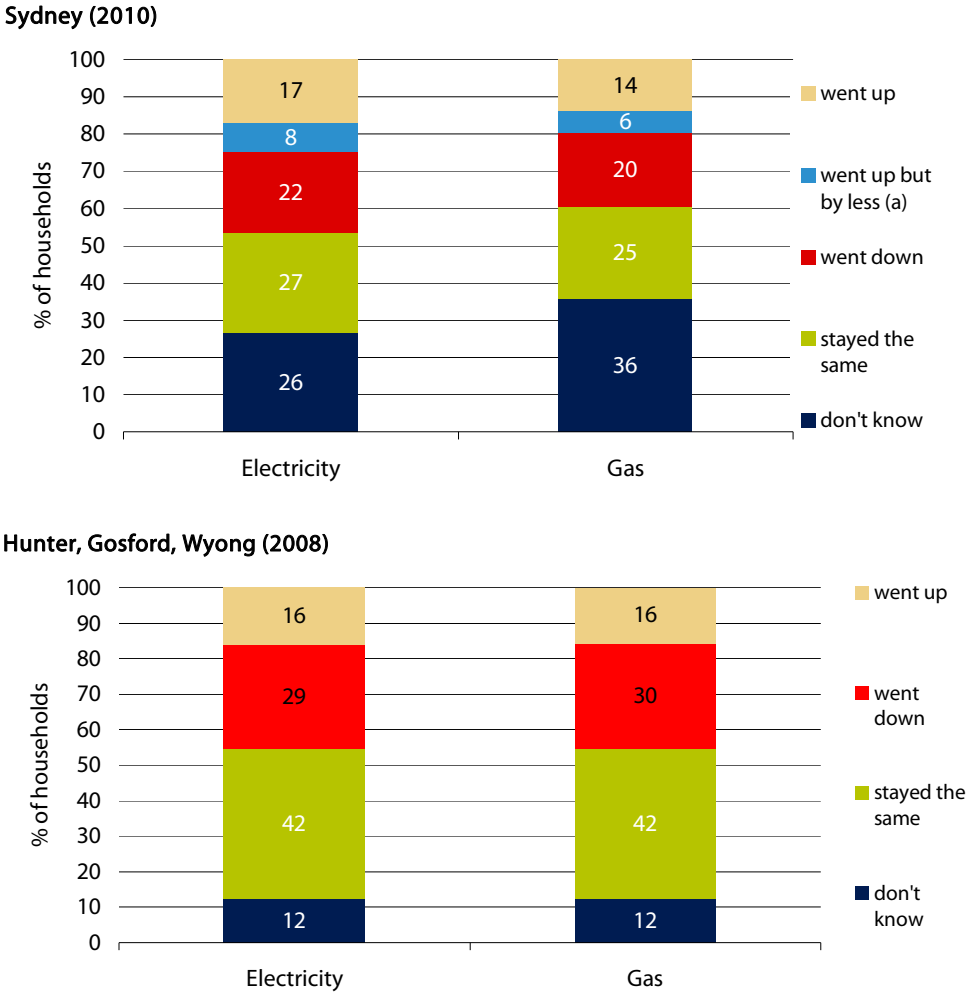


In light of the importance of cheaper prices as a reason to change their energy supply arrangements, we also asked respondents what had happened to their bills after they had made the change. Specifically, we asked whether they thought their bill had stayed the same, gone down, gone up, or gone up but by less compared to what would have occurred if they hadn't made the new arrangement.

Only 22% of electricity customers and 20% of gas customers in Sydney (2010) felt that their bills had gone down after entering the new arrangements. A further 8% of electricity customers and 6% of gas customers thought their bills would have gone up by more if they hadn't changed their arrangements. More than half of both electricity customers and gas customers thought their bills had stayed the same or they didn't know, while 17% of electricity customers and 14% of gas customers thought their bills had gone up.

We asked a similar question of respondents to our 2008 survey in the Hunter, Gosford and Wyong areas. One of the main differences between the findings for these areas compared to those for Sydney (2010) is that a higher proportion of households in Sydney were unsure whether their bills had gone up or down (for electricity, 26% compared to 12% in the Hunter, Gosford and Wyong areas, and for gas, 36% compared to 12% in the Hunter, Gosford and Wyong areas) (Figure 10.18).

Figure 10.18 Perceived impact on bills after changing arrangements (% of households)



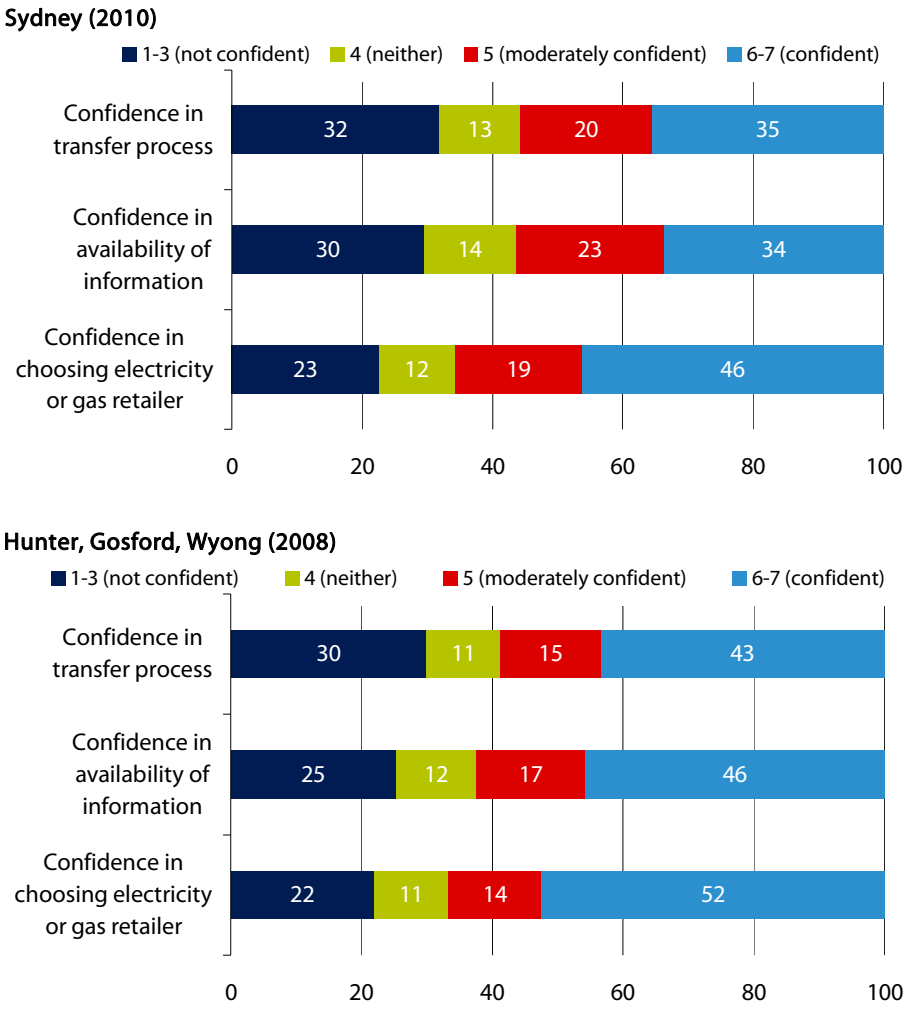
10.8 Confidence in choosing a retailer

Both the 2010 Sydney survey and the 2008 survey in the Hunter, Gosford and Wyong areas asked households about their confidence in the process of choosing their electricity or gas retailer. Overall, between 55% and 65% of households in Sydney (2010) said they were confident in their ability to choose a retailer, to access the information they need to decide on a retailer, and the process of transferring. The responses were similar in the Hunter, Gosford and Wyong areas in 2008, although a higher proportion of respondents in these areas expressed high levels of confidence (Figure 10.19).

Based on these findings, residential customers appear to be most confident in their ability to choose a retailer, a little less confident that they have the information they need, and least confident about the process of transferring. This suggests that competition may be improved if customers are provided with better information about alternative contract options and the transfer process. An important recent development in this regard is the on-line price comparison service that IPART has recently made available on our website, which gives up-to-date information about what contracts are available as well as their prices.[102]

[102] http://www.myenergyoffers.nsw.gov.au/

Figure 10.19 Confidence in the process of choosing a gas and/or electricity retailer



10.9 Understanding of complaint handling process

The 2010 and 2008 surveys asked respondents who they would go to if they had a problem or a complaint about their electricity or gas retailer. Most customers said they would go to their retailer (74% of respondents in Sydney and 87% of respondents in the Hunter, Gosford and Wyong areas). Respondents in Sydney were more likely to have said they would go to the Energy and Water Ombudsman (12%) than those in the Hunter, Gosford and Wyong areas (5%). However, a higher proportion of Sydney respondents said they did not know where to go (10% compared to 5% in the Hunter, Gosford and Wyong areas) (Table 10.1).

Table 10.1 Who customers say they would go to with a complaint (%)

	Sydney (2010)	Hunter, Gosford and Wyong areas (2008)
Retailer	74	87
Energy and Water Ombudsman	12	5
Don't know	10	5
Other	4	3

We looked more closely to the responses from Sydney (2010) households to see if there were any differences between different groups of households (eg, renters and owners, the different household structures, different levels of income, and the different dwelling types). The only notable difference we found was that twice as many high-income households as low-income households said they would go to the Energy and Water Ombudsman to make a complaint (18% compared to 9%).

Appendices

A Overview of the survey design and methodology

We (IPART) engaged Taverner Research (Taverner) to undertake interviews with resident households on our behalf in Sydney Water's area of operation, which covers the Sydney metropolitan region, the Blue Mountains and the Illawarra. Taverner was also responsible for obtaining consumption data from the relevant energy and water utilities.

A.1 Data collection method

A computer aided telephone interviewing (CATI) methodology was used for this survey. This is a change from past surveys, where a door-to-door (face-to-face) interview methodology was used.[103] The CATI approach was adopted because:

- It is significantly cheaper than a door-to-door methodology.
- It avoids the sampling bias that arises due to the inaccessibility of many apartment blocks and other multi-dwelling complexes that are security buildings.

We require consent signatures from respondents to permit water, gas and electricity agencies to release their billing data for inclusion in the analysis. A drawback of the CATI methodology is that it is more difficult to obtain consent signatures from respondents who complete the interview. Using a CATI approach involves obtaining these signatures by post. Only 67% of those who were interviewed returned their consent forms to Taverner, often following a number of reminder calls and a letter, thus adding to the cost and introducing a potential sample bias. One of the main reasons for using a door-to-door methodology in previous surveys was to obtain these consent signatures during the interview process.

Interviews were conducted from January to March 2010.

[103] Due to unexpected delays during the 2008 survey in the Hunter, Gosford and Wyong areas, some of the interviews were conducted using the CATI method.

A.2 Sample size

Consent forms were sent to a total of 3,399 respondents in the Sydney Water area who had completed the interview, and 2,281 (67%) of these were returned. Valid utility data were extracted for 2,192 of these households giving a total valid sample of 2,192.[104] Most of the households in this sample lived in the Sydney metropolitan area (85%), while 11% lived in the Illawarra and 4% lived in the Blue Mountains (Table A.1).

Matching utility data is discussed in section A.7 below.

Table A.1 Number of valid interviews with utility data by area

Survey area	Number	%
Sydney metropolitan	1,866	85%
Illawarra	242	11%
Blue Mountains	84	4%
Total	2,192	100%

A.3 Sample selection

The total survey area was segmented geographically into a substantial number of relatively small locations. Stratified samples of households were selected at random within each area. The number selected, and the target number of interviews sought in each location, was proportionate to the number of households in that location.

Experience with both telephone and door-to-door surveys has shown that lower income households are usually under-represented. Thus, to ensure that 30% (or as close to it as possible) of the final sample fell within the bottom 30% of household incomes, additional samples were drawn from locations known to have a higher incidence of low-income households. The locations used, and the proportion of households drawn from each location, are shown in Table A2.

[104] We subsequently excluded water consumption data for 3 households, giving a total sample size of 2,189 for our analysis of water consumption.

Table A.2 Proportion of stratified sample in each location (%)

Location	Proportion of stratified sample (%)
North Sydney to Manly	6.1
Liverpool	6.4
Villawood to Cabramatta	4.9
Concord to Lane Cove	6.1
Balmain to Strathfield	4.9
Lakemba to Hurstville	3.7
Botany to Arncliffe	5.7
Eastern Suburbs	3.9
City	3.1
Ryde to Hornsby	2.3
Collaroy to Palm Beach	4.4
Baulkham Hills to Rouse Hill	4.9
Blacktown to Penrith	5.6
North Rocks to Parramatta	5.1
Campbelltown to Mittagong	6.6
Bankstown to Georges Hall	3.1
Sutherland Shire	7.7
Blue Mountains	3.9
Wollongong	5.4

Note: The suburbs in each location are listed in Appendix B.

Source: Taverner Research, Final Technical Report: The 2010 IPART – Household Survey (August 2010).

The ideal method of selecting households within each location would be to have a list of the addresses and telephone numbers of all households in that location, and to select from these at random. Unfortunately it is not possible to do this using the available online database of residential phone numbers because:

- The database can only be searched by entering a surname, an initial and address information such as suburb, post code or street name. Databases that can be searched by postcode, suburb and street name have not been available since 2004.[105]
- The database excludes households that have paid to have the phone number excluded.

[105] Until 2004 third party suppliers provided databases copied from published White Pages telephone books that could be searched by postcode, suburb and street name. While these data bases were always incomplete and somewhat out of date, they provided a reasonable and convenient sampling frame for telephone survey samples. Publication of these products ceased in mid 2004 following successful legal action by Telstra and its Sensis subsidiary for breach of copyright.

One substitute approach is to generate phone numbers at random within known valid exchange prefixes. This method (Random Digit Dialling) has a number of problems, with the most serious of these being the cost and the proportion of numbers generated that are not connected or are not residential phone numbers.

Taverner developed an alternative selection approach that significantly reduces the proportion of invalid numbers. In essence, this approach involves:

- Selecting a large sample of surnames from the last third-party data base, published in 2004,[106] stratified by postcode and suburb (the rationale for this is that the distribution of surnames in a community will have changed very little since 2004).
- Using the proportions of surnames in this sample as the basis for selecting surnames to be included in the online database search for each suburb.
- Developing procedures to avoid any selection biases that may arise, for example due to the alphabetical listing of initials in the online database search.

Using this method, Taverner generated a list of telephone numbers to serve as the starting point for recruitment.

A.4 Explanatory letter

In previous surveys, a formal letter on IPART's letterhead was provided to each participant as part of the introduction to the study, verifying the interviewer's presence and providing an explanation of the survey. The letter also provided an IPART telephone number to call in case of need or for verification, in addition to the interviewing company's number.

The initial intention for this survey was to mail introductory letters to all potential participants, along with consent forms. However, an assessment of this strategy after the pilot survey showed that the benefits did not justify the added cost (see below). Instead, the letters were only sent to households that had completed the CATI interview, along with the consent forms to be signed. Copies of the letter and the consent forms are provided in Appendix C.

A.5 Piloting

An initial 50 CATI pilot interviews were conducted to assess the flow, duration and clarity of the interview. Another purpose of the pilot survey was to test the process for obtaining correctly signed and completed consent forms.

[106] See previous footnote.

A.5.1 Flow, duration and clarity of the interview

Following the pilot interviews, a number of changes were made to the questionnaire to improve the flow and shorten the duration of the interview. The main changes involved

- reducing introductory information provided by the interviewer
- dropping some questions
- reducing name and address information to be collected at the end of the interview, and
- restructuring part of the questionnaire to improve the flow and clarity of the interview.

The final questionnaire is shown in Appendix D.

A.5.2 Process for collecting signed consent forms

In order to test various ways of obtaining correctly signed and completed consent forms, 25 households were interviewed that had received an advance notification letter (and consent forms) by post. Another 25 households were interviewed first, and afterwards received the letter (and consent forms) by post.

The time and cost involved in sending advance notification letters to all households that might be called were assessed, and weighed up against the improved response rate. The conclusion was that sending pre-survey letters was not cost-effective: to reach the original target of 2,600 to 2,700 CATI interviews matched with returned consent forms approximately 12,000 letters would have to be sent out, at considerable expense.

A.6 Response rate

In total, Taverner used 45,043 telephone numbers and contacted 28,020 households. The remaining 17,023 dialled numbers (38%) did not result in any contact with households, mainly because calls were unanswered or were answered only by answering machines, usually after repeated attempts.

Of the households that were contacted, 71% refused to participate in the survey. A further 16% did not complete the interview, or completed the interview but were subsequently found to be ineligible for inclusion in the survey. Examples of reasons for incomplete interviews are language barriers and the person responsible for paying the bills was not available during the survey period.[107] Households were ineligible for inclusion in the survey if they had lived at the current address for less than 15 months, lived in a mobile home or were out of Sydney Water's area of

[107] A full list of reasons for incomplete interviews is provided in Taverner Research Company, *Final Technical Report:The 2010 IPART – Household Survey (August 2010).*

operation. This means that Taverner completed 3,399 interviews with households that were eligible for inclusion in the survey (12% of households that were contacted).

The next step in the survey was to collect consent signatures from respondents to allow utilities to release their billing data. This entailed posting consent forms to respondents, who then posted the completed forms back to Taverner. Signed consent forms were received from 2,281 households, or 67% of eligible households that had completed the interview.

Table A.3 Number of households contacted, interviews completed and consent forms received.

	Number	% of telephone numbers used	% of households contacted	% of valid interviews
Total telephone numbers used	45,043	100	na	na
Not contacted[b]	17,023	38	na	na
Total contacted	**28,020**	62	100	na
Refused to participate	20,004	44	71	na
Interview not completed/not valid[a]	4,617	10	16	na
Completed interviews with eligible households	**3,399**	8	12	100
No consent forms received	1,118	na	na	33
Consent forms received	2,281	na	na	67

a The main reasons for interviews not being completed or invalid were language barriers, interviews pending, respondents unavailable during the survey period and respondents residing at the current address for less than 15 months. The full list of reasons is provided in Table 2 of Taverner's technical report to IPART (full reference below).

b These telephone numbers were called but no contact was made with a household. The main reasons for this include calls unanswered after a number of attempts, telephone numbers not connected and answering machines.

Source: Taverner Research Company, *Final Technical Report: The 2010 IPART – Household Survey (August 2010).*

A.7 Consumption information from utilities

As previously mentioned, in order to obtain billing and consumption data for electricity, gas and water, survey participants were asked to sign consent forms allowing the relevant utilities to release that information to Taverner for inclusion in the data analysis. Participants who indicated that they were unwilling to sign consent forms were not included in the survey.

Separate consent forms were required for electricity, gas and water.

The utilities were asked to provide actual consumption data at the household level by billing period. They used the address, name and billing details provided on the signed consent forms extract the appropriate billing records. Importantly, all consent forms included unique identifiers that made allowed the utilities to extract the data

relatively easily (NMI numbers for electricity, DPI numbers for gas and account numbers for water). These numbers appear on bills, and households that were unable to find their bills were not interviewed.

With the help of these unique identifiers, the utilities were able to extract billing data for 98% to 99% all the households that provide signed consent forms (see Table A.4). After inspecting the consumption data a few cases were discarded, for example because they had less than 12 month of billing data or because of unreliable water consumption information for units in multi-dwelling complexes with bulk meters.[108] Almost all cases that did not have matching consumption data for all the utilities were also discarded, for example a number of cases with valid electricity consumption data were discarded because they did not have matching water consumption data. This left 2,192 valid cases in the sample with electricity consumption data, 1,118 cases with gas consumption data and 2,189 cases with water consumption data (Table A.4).

Table A.4 Completed interviews with matched consumption data

Utility	Consent forms sent to utilities (total records)	Records with matched data	Proportion of records with matched data	Records discarded	Records with matched and valid consumption data	Proportion of records with matched and valid consumption data
	number	number	%	number	number	%
Sydney Water	2,273	2,238	98	49	2,189	96
Jemena (gas)	1,142	1,132	99	14	1,118	98
EnergyAustralia (electricity)	1,209	1,189	98	21	1168	97
Integral Energy (electricity)	1,059	1,049	99	25	1024	97
Total electricity	2,268	2,238	99	46	2,192	97

Source: Taverner Research Company, *Final Technical Report: The 2010 IPART – Household Survey (August 2010).*

A.8 Annualised billing and consumption data

Billing and consumption data were provided for each billing period by the utilities (about 3 months). Billing periods for the last year added to 365 days for some, but not for others. For those for whom the last 4 billing periods did not add to 365 days, the data were annualised. This involved dividing the total consumption for the

[108] We estimated the consumption of households in multi dwelling complexes with bulk meters by dividing the total metered volume (measured by the bulk meter) by the number of dwelling units in the complex. We discarded some cases where this attributed consumption was unreliable. For example, we founds some cases that had water consumption volumes and questionnaire responses that suggested the dwelling was part of a multi-dwelling complex, but where the data indicated that only 1 dwelling unit was served by the meter.

billing periods by the number of days represented by these periods and then multiplying that amount by 365 days. Billing and consumption data are, therefore, reported on an 'annualised' or 'per annum' basis (ie, over 365 days) for water, gas and electricity.

A.9 Weighting

The purpose of weighting is to make the sample more closely resemble the population under study. In weighting, each respondent in the data is assigned a weight to reflect its importance relative to other respondents. A weight greater than one increases the importance of the respondent, less than one decreases the importance of the respondent, and one represents an unweighted case.

Weighting is most widely used to make the sample data more representative of the target population on specific characteristics. Weighting should be applied with caution, and the weighting procedure should be documented and included in the report, because weights can significantly adjust the data.

A.9.1 Weights used for 2003 and 2006 Sydney surveys

For the 2003 and 2006 Sydney surveys, we calculated 4 sets of weights which we applied one at a time depending on the purpose of the analysis. These weights were:

- 3 sets of consumption weights, one each for electricity gas and water. The purpose of these weights was to match the distribution profiles of the electricity, gas or water utilities respectively.
- 1 set of income weights, to match the income profile from the 2006 Census.

A big advantage of using consumption weights is that it allows one to aggregate the sample to represent all the utility's customers in the survey area.[109] This was important in 2003 and 2006, in particular to help understand the implications of changing Sydney Water's tariff structure for water to an inclining block tariff.

However, one of the problems with the consumption and income weights was that they did not correct for the under-representation in the survey samples of flats, or families with children. This caused some distortions in the surveys' finding. Another problem is that the survey outcomes were somewhat different depending on the weights that were applied.

[109] The survey area covers only part of the electricity and gas utilities' supply areas.

A.9.2 Weights used for the 2008 survey in the Hunter, Gosford and Wyong areas

For the 2008 survey in the Hunter, Gosford and Wyong areas, we used regional weights to correct for the over-representation of households in the Hunter area.

We also calculated income weights, but found that they caused distortions in the family structure. In particular, they led to an over-representation of families with children compared to ABS data. Because these distortions affected consumption findings, we decided not to use the income weights for most of the analysis.[110]

A.9.3 Weights for the 2010 Sydney survey

For the 2010 survey we investigated using consumption weights, but decided not to proceed with this option. One of the reasons for this is that we no longer needed to use the survey sample to represent all the customers of any of the utilities. Another reason was that the consumption profiles that the utilities could provide included customers that we excluded from our survey, for example holiday homes and, for at least one utility, non-household customers on residential tariffs such as boarding houses and churches.

Instead, we used a combined weight that simultaneously corrected for sample biases in income distribution, dwelling type and family structure. To show the extent of the sample bias, Table A.5 compares the population's income, dwelling type and family structure profiles with those of the survey sample. The population profiles were constructed using ABS data on the Sydney Statistical District.

As show in the tables, one of the main biases in the sample was an under-representation of flats and a corresponding over-representation of free-standing houses. Another important bias was an under-representation of 1 person households and single parent families and a corresponding over-representation of couples with no children living at home.

The resulting individual case weights ranged from 0.55 to under 4.75. Just over 98% of the weights were 2.5 or less, and the average was 1.0. Large case weights were mainly confined to single parent families living in flats. While some of the weights were larger than is strictly desirable, they were considered acceptable. [111]

[110] For more details see IPART, *Residential energy and water use in the Hunter, Gosford and Wyong - Results from the 2008 household survey*. Electricity, Gas and Water – Research Paper, December 2008, Appendix A.

[111] For more detail on how the weights were calculated, see Taverner Research Company, *Final Technical Report: The 2010 IPART – Household Survey (August 2010).*

Table A.5 Comparison of the population and the survey sample distribution profiles for income, dwelling type and family structure (%)

Income range	Population (target) (%)	Sample (%)
Income distribution		
less than $18,200 per year	12.8	10.2
$18,200 to less than $33,800 per year	12.3	12.6
$ 33,800 to less than $ 41,600 per year	5.6	6.4
$ 41,600 to less than $62,400 per year	15.9	13.5
$ 62,400 to less than $88,400 per year	12.6	13.5
$88,400 to less than $130,000 per year	13.6	16.3
$130,000 to less than $156,000 per year	7.8	6.9
$156,000 or more per year	8.2	8.3
not specified	11.3	12.5
Dwelling type		
Free standing house	61.8	76.6
Semi-detached, row, terrace house or town house	12.5	12.1
Flat, unit or apartment	25.7	11.4
Family structure		
1 person households	23.1	19.9
Couple, children at home	35.8	36.8
Couple, no children at home	24.1	30.7
Single parent families	11.4	7.1
Other households (group + other family)	5.6	5.5

Note: the population (target) profiles are drawn from ABS data for the Sydney Statistical District.

Source: Taverner Research Company, *Final Technical Report: The 2010 IPART – Household Survey (August 2010)*

A.10 Potential sample biases

Even though every attempt was made to select a random sample and to correct for observed sample biases using weights, it is important to consider other potential biases within the weighted survey sample when interpreting the data.

The low response rate may indicate a bias in the type of household willing to respond, for example

- Younger households may be under-represented because they are less seldom home, may be busier if they have young or school aged children, and are more likely to not have land lines. This possibility is suggested by the following: looking at the population older than 24 years, only 44% of respondents were younger than 54 years old, while 65% of the total population[112] fell into this age group. An under-representation of younger households is also suggested by analysis of the survey data which shows that couples with children up to the age of 15 years were the least likely household type to return their consent forms after completing the interview, while middle or mature aged couples with no children living at home were the most likely to return their consent forms.
- Concern over privacy issues and giving of personal information may have led to an under-representation of some households such as recently arrived immigrants.

[112] Calculated from 2006 census data for Sydney statistical division, the Blue Mountains SLA and Illawarra statistical division.

B The suburbs included in the survey sample

The suburbs included in the 2010 survey sample are listed below. Figure B.1 provides a map of the locations included in Sydney Water's area of operations.

1. North Sydney to Manly

Artarmon; Balgowlah; Balgowlah Heights; Balmoral; Cammeray; Castlecrag; Chatswood; Clifton Gardens; Clontarf; Cremorne; Cremorne Point; Crows Nest; Curl Curl; Fairlight; Freshwater; Greenwich; Harbord; Kirribilli; Lavender Bay; Manly; Manly Vale; McMahons Point; Middle Cove; Milsons Point; Mosman; Naremburn; Neutral Bay; North Balgowlah; North Sydney; Northbridge; Seaforth; St Leonards; Waverton; Waverton; West Chatswood; Willoughby; Willoughby North; Wollstonecraft.

2. Liverpool

Abbotsbury; Ashcroft; Austral; Bonnyrigg; Bonnyrigg Heights; Bossley Park; Busby; Cartwright; Casula; Catherine Field; Cecil Hills; Chipping Norton; Edensor Park; Glenfield; Green Valley; Greenfield Park; Hammondville; Heckenberg; Hinchinbrook; Holsworthy; Horningsea Park; Horsley Park; Hoxton Park; Kemps Creek; Leppington; Liverpool; Lurnea; Miller; Moorebank; Mt Pritchard; Prairiewood; Prestons; Rossmore; Sadleir; St Johns Park; Voyager Point; Wakeley; Warwick Farm; Wattle Grove; West Hoxton.

3. Villawood to Cabramatta

Cabramatta; Cabramatta West; Canley Heights; Canley Vale; Carramar; Chester Hill; Fairfield; Fairfield East; Fairfield Heights; Fairfield West; Guildford; Guildford West; Horsley Park; Lansvale; Old Guildford; Sefton; Smithfield; Villawood; Wetherill Park; Woodpark; Yennora.

4. Concord to Lane Cove

Abbotsford; Breakfast Point; Cabarita; Canada Bay; Chiswick; Concord; Concord West; Drummoyne; Five Dock; Gladesville; Hunters Hill; Lane Cove; Lane Cove

North; Lane Cove West; Liberty Grove; Linley Point; Longueville; Mortlake; North Strathfield; Northwood; Rhodes; Riverview; Rodd Point; Russell Lea; Woolwich.

5. Balmain to Strathfield

Annandale; Ashfield; Balmain; Balmain East; Birchgrove; Burwood; Burwood Heights; Camperdown; Croydon; Croydon Park; Dulwich Hill; Enfield; Forest Lodge; Glebe; Greenacre; Haberfield; Homebush; Homebush West; Leichhardt; Lewisham; Lilyfield; Marrickville; Petersham; Rozelle; South Strathfield; St Peters; Stanmore; Strathfield; Strathfield South; Summer Hill; Tempe.

6. Lakemba to Hurstville

Ashbury; Bass Hill; Belfield; Belmore; Blakehurst; Campsie; Canterbury; Carss Park; Clemton Park; Connells Point; Earlwood; Hurlstone Park; Hurstville; Hurstville Grove; Hurstville South; Kyle Bay; Lakemba; Lugarno; Mortdale; Oatley; Peakhurst; Peakhurst Heights; Penshurst; Punchbowl; Riverwood; Roselands; South Hurstville; Wiley Park.

7. Botany to Arncliffe

Allawah; Arncliffe; Banksia; Bardwell Park; Bardwell Valley; Beverley Park; Beverly Hills; Bexley; Bexley North; Botany; Brighton-le-Sands; Carlton; Chifley; Dolls Point; Eastgardens; Eastlakes; Hillsdale; Kingsgrove; Kogarah; Kogarah Bay; Kyeemagh; La Perouse; Little Bay; Malabar; Mascot; Matraville; Monterey; Narwee; Phillip Bay; Ramsgate; Ramsgate Beach; Rockdale; Rosebery; Sandringham; Sans Souci; Wolli Creek.

8. Eastern Suburbs

Bellevue Hill; Bondi; Bondi Beach; Bondi Junction; Bronte; Centennial Park; Clovelly; Coogee; Daceyville; Darling Point; Double Bay; Dover Heights; Edgecliff; Kensington; Kingsford; Maroubra; North Bondi; Paddington; Pagewood; Point Piper; Queens Park; Randwick; Rose Bay; South Coogee; Tamarama; Vaucluse; Watsons Bay; Waverley; Woollahra.

9. City

Alexandria; Chippendale; Darlinghurst; Darlington; East Sydney; Elizabeth Bay; Enmore; Erskineville; Eveleigh; Haymarket; Kings Cross; Millers Point; Newtown; Potts Point; Pyrmont; Redfern; Rushcutters Bay; Surry Hills; Sydney; The Rocks; Ultimo; Waterloo; Woolloomooloo; Zetland.

10. Ryde to Hornsby

Asquith; Bar Point; Beecroft; Berowra; Berowra Heights; Berowra Waters; Brooklyn; Carlingford; Castle Cove; Castle Hill; Cheltenham; Cowan; Cowan; Denistone; Denistone East; Denistone West; East Killara; East Lindfield; East Roseville; East Ryde; Eastwood; Epping; Epping North; Gordon; Henley; Hornsby; Hornsby Heights; Killara; Lindfield; Macquarie Park; Marsfield; Meadowbank; Melrose Park; Mooney Mooney; Mt Colah; Mt Kuring-Gai; Normanhurst; North Epping; North Ryde; North Turramurra; Pennant Hills; Putney; Pymble; Roseville; Roseville Chase; Ryde; South Turramurra; St Ives; St Ives Chase; Tennyson Point; Thornleigh; Turramurra; Wahroonga; Waitara; Warrawee; West Pymble; West Ryde; Westleigh.

11. Collaroy to Palm Beach

Allambie Heights; Avalon; Avalon Beach; Bayview; Beacon Hill; Belrose; Bilgola; Brookvale; Church Point; Clareville; Coasters Retreat; Collaroy; Collaroy Plateau; Cromer; Cromer Heights; Davidson; Dee Why; Elanora Heights; Forestville; Frenchs Forest; Great Mackerel Beach; Killarney Heights; Mona Vale; Morning Bay; Narrabeen; Narraweena; Newport; North Curl Curl; North Manly; North Narrabeen; Oxford Falls; Palm Beach; Scotland Island; Terrey Hills; Warriewood; Wheeler Heights.

12. Baulkham Hills to Rouse Hill

Acacia Gardens; Agnes Banks; Annangrove; Arcadia; Baulkham Hills; Beaumont Hills; Bella Vista; Berkshire Park; Bilpin; Bligh Park; Bowen Mountain; Box Hill; Canoelands; Cattai; Cherrybrook; Clarendon; Crestwood; Dural; Ebenezer; Freemans Reach; Galston; Glenhaven; Glenorie; Glossodia; Grose Vale; Hobartville; Homebush Bay; Kellyville; Kellyville Ridge; Kenthurst; Kurmond; Kurrajong; Kurrajong East; Kurrajong Heights; Kurrajong Hills; Londonderry; Maraylya; Maroota; Marsden Park; McGraths Hill; Middle Dural; Mt Tomah; Newington; North Richmond; Northmead; Orange; Pitt Town; Quakers Hill; Richmond; Riverstone; Round Corner; Rouse Hill; Scheyville; Silverwater; South Windsor; Stanhope Gardens; The Slopes; West Pennant Hills; Wilberforce; Windsor; Windsor Downs; Winston Hills; Yarramundi.

13. Blacktown to Penrith

Bidwill; Blackett; Blacktown; Cambridge Gardens; Cambridge Park; Castlereagh; Claremont Meadows; Colyton; Cranebrook; Dean Park; Dharruk; Doonside; Eastern Creek; Emu Heights; Emu Plains; Erskine Park; Glendenning; Glenmore Park; Glenwood; Greendale; Hassall Grove; Hebersham; Jamisontown; Kings Langley; Kings Park; Kingswood; Kingswood Park; Lalor Park; Leonay; Lethbridge Park; Lewis Ponds; Llandilo; Lower Lewis Ponds; Luddenham; Marayong; Minchinbury; Mt Druitt; Mulgoa; North St Marys; Oakhurst; Orchard Hills; Oxley Park; Parklea;

Penrith; Penrith South; Plumpton; Prospect; Rooty Hill; Seven Hills; Shalvey; Silverdale; St Clair; St Marys; Tregear; Wallacia; Warragamba; Werrington; Werrington County; Werrington Downs; Whalan; Willmot; Woodcroft.

14. North Rocks to Parramatta

Constitution Hill; Dundas; Dundas Valley; Ermington; Girraween; Granville; Greystanes; Harris Park; Mays Hill; Merrylands; Merrylands West; North Parramatta; North Rocks; Oatlands; Old Toongabbie; Parramatta; Pemulwuy; Pendle Hill; Rosehill; Rydalmere; South Granville; South Wentworthville; Telopea; Toongabbie; Wentworthville; Westmead.

15. Campbelltown to Mittagong

Adamstown; Airds; Ambarvale; Appin; Ashtonfield; Balmoral Village; Bargo; Belimbla Park; Belmont North; Blair Athol; Blairmount; Bow Bowing; Bradbury; Brownlow Hill; Bullio; Buxton; Camden; Camden Park; Camden South; Campbelltown; Carrington; Claymore; Cobbitty; Colo Vale; Couridjah; Currans Hill; Denham Court; Douglas Park; Eagle Vale; Elderslie; Ellis Lane; Englorie Park; Eschol Park; Glen Alpine; Grasmere; Harrington Park; High Range; Hill Top; Ingleburn; Kearns; Kentlyn; Kirkham; Leumeah; Macquarie Fields; Macquarie Links; Maryland; Medowie; Menangle; Minto; Minto Heights; Mittagong; Mt Annan; Mt Hunter; Narellan; Narellan Vale; Oakdale; Oran Park; Orangeville; Pheasants Nest; Picton; Raby; Razorback; Rosemeadow; Ruse; Spring Creek; Spring Farm; St Andrews; St Helens Park; Stanhope; Sunshine; Tahmoor; The Oaks; Theresa Park; Thirlmere; Wedderburn; Welby; Werombi; Willow Vale; Wilton; Woodbine; Woodlands; Yanderra; Yerrinbool.

16. Bankstown to Georges Hall

Auburn; Bankstown; Berala; Birrong; Condell Park; East Hills; Georges Hall; Lidcombe; Milperra; Mt Lewis; Padstow; Padstow Heights; Panania; Picnic Point; Regents Park; Revesby; Revesby Heights; Yagoona.

17. Sutherland Shire

Alfords Point; Bangor; Barden Ridge; Bonnet Bay; Bundeena; Burraneer; Caringbah; Caringbah South; Como; Cronulla; Dolans Bay; Engadine; Grays Point; Gymea; Gymea Bay; Heathcote; Illawong; Jannali; Kangaroo Point; Kareela; Kirrawee; Kurnell; Lilli Pilli; Loftus; Maianbar; Menai; Miranda; Oyster Bay; Royal National Park; Sutherland; Sylvania; Sylvania Waters; Taren Point; Waterfall; Woolooware; Woronora; Woronora Heights; Yarrawarrah; Yowie Bay.

18. Blue Mountains

Blaxland; Blayney; Central Macdonald; Faulconbridge; Glenbrook; Gunderman; Hawkesbury Heights; Hazelbrook; Higher MacDonald; Katoomba; Lapstone; Leura; Linden; Lower Macdonald; Lyndhurst; Medlow Bath; Molong; Mt Riverview; Newbridge; Orange; Spencer; Springwood; Springwood North; St Albans; Valley Heights; Warrimoo; Webbs Creek; Winmalee; Wiseman's Ferry; Woodford; Yellow Rock (Springwood).

19. Wollongong

Austinmer; Balgownie; Bateau Bay; Bellambi; Berkeley; Bulli; Coledale; Coniston; Cordeaux Heights; Corrimal; Corrimal East; Cringila; Fairy Meadow; Farmborough Heights; Figtree; Figtree Heights; Gwynneville; Helensburgh; Keiraville; Kembla Grange; Kiama Downs; Lake Heights; Lake Illawarra; Mangerton; Mt Keira; Mt Kembla; Mt Ousley; Mt Pleasant; Mt St Thomas; Mt Warrigal; North Wollongong; Otford; Penrose; Port Kembla; Primbee; Russell Vale; Scarborough; Stanwell Park; Tarrawanna; Thirroul; Towradgi; Unanderra; Warrawong; West Wollongong; Windang; Wollongong; Wombarra; Woonona.

Source: Taverner Research Company, *Final Technical Report: The 2010 IPART – Household Survey, August 2010. Project Reference: 3485*, Appendix D.

C Explanatory letter and consent forms

Independent Pricing and Regulatory Tribunal

IPART
New South Wales

Our reference: 09/201

dd/mm/2010

PO Box Q290, QVB Post Office NSW 1230
Level 2, 44 Market Street Sydney NSW 2000
T (02) 9290 8400 F (02) 9290 2061
ABN 49 202 260 878

www.ipart.nsw.gov.au

«NAME»

«ADDRESS»

«SUBURB» «STATE» «POSTCODE»

SURVEY OF WATER, ELECTRICITY AND GAS USAGE

Thank you for agreeing to participate in IPART's survey on electricity, gas and water usage which is being conducted on our behalf by *Taverner Research* (Taverner*)*. This survey is being undertaken to enable us to better understand the impact of price changes on households.

An important part of this survey is to obtain information on electricity, gas and water usage from your suppliers. We need your permission for Taverner to do this.

I have attached a consent form for you to complete. The information you require to fill the form in is available on your bills. It would be helpful if you can find recent bills from your suppliers of water, electricity and gas (where applicable). Once you have completed the form, please sign it and return it to Taverner in the enclosed Reply Paid envelope.

The responses you give, and your billing data, will be used for statistical purposes only. Information that can identify you will not be disclosed to IPART or to any other person or authority.

If you would like more information about the survey please contact Michael Seery (ph 9290 8421) at the Independent Pricing and Regulatory Tribunal or call *Taverner* directly (ph 1800 602 779).

Once again I thank you for your help in this important study,

James Cox

James Cox
Acting Chairman and Chief Executive Officer

FREQUENTLY ASKED QUESTIONS

Who is IPART?

The Independent Pricing and Regulatory Tribunal of NSW (IPART) is responsible for setting prices for electricity, gas and water in NSW. Further information on IPART may be found on IPART's website: http://www.ipart.nsw.gov.au/.

How can I get access to the billing information provided to Taverner?

If you would like to receive a copy of the information that your electricity, gas or water utility discloses to *Taverner Research*, you can call 1800 602 779 (a free call). To verify your identity, you will need to provide your name, billing address and account number.

What happens to the information provided by my utility?

- *Taverner Research* will send your consent form to your utility.
- Your utility will authorise *Taverner Research* to use the billing information listed on the consent form.
- *Taverner Research* will combine this billing information with the information provided by you during the interview.
- *Taverner Research* will permanently delete all names, addresses and account numbers from its records within three months of receiving the information from your utility.
- *Taverner Research* will provide to IPART records that have had all names and addresses deleted. These unit records will be used for statistical purposes only and will not contain information that can identify you.
- *Taverner Research* will collate the survey data using only the statistical information.
- IPART will produce a written report on the survey that will be available to the public on the IPART's website: http://www.ipart.nsw.gov.au/.

This report should be available in October 2010.

What previous research has been undertaken similar to this?

Similar research was conducted in the Sydney Metropolitan area in 2003 and 2006. You can access the results of the last research by going to:

http://www.ipart.nsw.gov.au/investigation_content.asp?industry=5&sector=current&inquiry=50&doctype=27&doccategory=1&docgroup=1 and /or

http://www.ipart.nsw.gov.au/investigation_content.asp?industry=5&sector=current&inquiry=105&doctype=10&doccategory=1&docgroup=1

or call *Taverner Research* on 1800 602 779 for an explanation of how to locate the reports.

CONSENT TO PROVIDE ELECTRICITY, WATER & GAS INFORMATION

Dear Sir/ Madam,

I (*print name*) _____ of

Unit/ Street Number _____ Street Name _____

Suburb _____ Postcode ☐☐☐☐ , request that

(*tick appropriate boxes*):

☐ **Energy Australia**	provide <u>electricity</u> consumption information for the address and/or the National Meter Identification (NMI) number entered in this form to an authorised representative of *Taverner Research*. *NB: Depending on your postcode, the electricity distribution lines & meters are owned by either Energy Australia or Integral Energy*
☐ **Integral Energy**	
☐ **Sydney Water**	provide <u>water</u> consumption information for the address entered in this form to an authorised representative of *Taverner Research.*
☐ **Jemena Gas Networks Pty Ltd**	provide <u>gas</u> consumption information for the address and/or the gas account DPI/MIRN number entered in this form to an authorised representative of *Taverner Research.* *NB: Jemena is the owner of gas pipes & meters in Greater Sydney Area*

I have provided the relevant account details on the following page.

I am resident at the above address and make this request for the supply of this information voluntarily.

I understand that:

1. Any information supplied by you to Taverner Research is confidential and will only be disclosed by Taverner Research to the NSW Independent Pricing and Regulatory Tribunal (IPART) ***in a form that <u>does not</u> disclose my name and address***.
2. The data will be used for statistical purposes <u>only</u> by IPART, and will be treated in accordance with the Privacy and Personal Information Act 1998 (NSW).

3. Any request for supply of gas consumption information is made voluntarily under section 138 of the National Gas Rules.
4. All information will be deleted from Taverner Research's records within three months.

Yours faithfully,

Signature: _____ **Date:** ____ /____ / 2010

(EVERYONE TO COMPLETE ELECTRICITY SECTION)

(a) ELECTRICITY ACCOUNT INFORMATION

Account holder(s) details *(AS SHOWN on electricity bill, use initials if necessary)*

Person 1: Title ____ First name _____ Middle name _____ Last Name _____

Person 2: Title ____ First name _____ Middle name _____ Last Name _____

NMI number ☐☐☐☐☐☐☐☐☐☐☐ *(NMI number is not your electricity account number. It is a separate 11 digit number, labelled 'NMI' or 'National Metering Identifier', printed on your invoice)*

Address of property *(if different to address on page 1)*

Unit/Street Number _____ Street Name _____

Suburb _____ Postcode ☐☐☐☐

(EVERYONE TO COMPLETE WATER SECTION)

(b) WATER ACCOUNT INFORMATION

Account holder details *(AS SHOWN on water bill, use initials if necessary)*

If **owner** of the property complete water account holder details:

Person 1: Title ____ First name _____ Middle name _____ Last Name _____

Person 2: Title ____ First name _____ Middle name _____ Last Name _____

Account Number ☐☐☐☐☐☐☐ *(It is a 7 digits number, shown on any water bill)*

If **tenant** of the property complete tenant details:

First name _____ Last Name _____

Address of property *(if different to address on page 1)*

Unit/Street Number _____ Street Name _____

Suburb _____ Postcode ☐☐☐☐

(COMPLETE GAS SECTION ONLY IF PROPERTY HAS GAS CONNECTION)

(c) GAS ACCOUNT INFORMATION

Account holder details *(AS SHOWN on gas bill, use initials if necessary)*

Person 1: Title ____ First name _____ Middle name _____ Last Name _____

Person 2: Title ____ First name _____ Middle name _____ Last Name _____

MIRN/ DPI Number ☐☐☐☐☐☐☐☐☐☐☐ *(MIRN/ DPI number is not your gas account number. It is a separate 11 digit number, labelled MIRN or DPI, printed on your invoice)*

Address of property *(if different to address on page 1)*

Unit/Street Number _____ Street Name _____

Suburb _____ Postcode ☐☐☐☐

D Final Questionnaire

Please note that section 1 of the survey questionnaire (electricity and gas markets) was restructured between the pilot survey and the full survey. For this reason, the numbers in section 1 do not follow consecutively.

IPART Household Survey, FINAL QUESTIONNAIRE

START TIME | _____:_____ | RECORDED AUTOMATICALLY
Region | ___ | RECORDED AUTOMATICALLY
Postcode| ___ | ___ | ___ | ___ | RECORDED AUTOMATICALLY

INTRODUCTION

Q1PRE
Hello, my name is [NAME]. I am calling from Taverner Research which has been commissioned by IPART (the Independent Pricing and Regulatory Tribunal) to collect information about your use of water, electricity, gas and public transport.

IPART regularly collects such information from a random sample of households and uses this information to make sure that its decisions about pricing of these services are fair to all concerned. By taking part in this study you will be helping IPART make sure that its decisions about the prices charged for these services are fair.

Q2PRE
Any information you provide is confidential and will only be used for statistical purposes. Any details that might identify you or your household will be removed from the data in August 2010. By law none of the information can be used for any purpose except helping IPART make decisions about fair pricing of the services.

We would like to speak to the person who normally pays the household bills.

WHEN SPEAKING TO THE PERSON WHO NORMALLY PAYS THE HOUSEHOLD BILLS CONTINUE WITH THE SURVEY.

For the purposes of training, this call could be monitored by my supervisor

SURVEY ON ELECTRICITY, GAS AND WATER

Q1SCR Have you lived at [this address – INSERT ADDRESS] for 15 months or more?

1. Yes
2. No - **TERMINATE**

Q2SCR Which of the following **best** describes where you live?

1. A Separate house
2. A Dwelling and Non-dwelling combined e.g. shop, houses **– ASK Q2ASCR**
3. A Semi-detached or terrace house, villa unit, town house, or duplex
4. A Granny flat
5. A Low rise block of flat or units with 1 or 2 storeys
6. A 3 storey block of flats
7. A high rise block of flats or units with 4 or more storeys
8. A Mobile or improvised dwelling **- TERMINATE**

IF NOT CODE 2 IN Q2SCR GO TO Q3SCR

Q2aSCR As we go through the questions, please remember that I am only asking about the part of the dwelling that you live in, not the shop or business part.

Interviewer note: If a dwelling and shop / business are combined, questions refer only to the dwelling, not the business

1. Continue

Q3SCR Is this your permanent residence or a holiday home?

1. Permanent
2. Holiday - **TERMINATE**

IF NOT 1 IN Q2SCR GO TO Q5SCR

Q4SCR Can you tell me the approximate size of your block of land?

INTERVIEWER NOTE: NORMAL BLOCK OF LAND IN THE SUBURBS IS MEDIUM

1. Small (Less than 500 square metres/ less than 0.12 acres)
2. Medium (500 to 900 square metres/ 0.12 to 0.22 acres)
3. Large (More than 900 square metres/ more than 0.22 acres)
4. (Don’t know)

Q5SCR How good are the respondent’s English language skills?

1. Enough to complete the interview without assistance - **GO TO Q7SCR**
2. Might need help to complete the interview

Q6SCR Would you like me to get someone who speaks your first language to finish this interview with you?

1. No – willing to complete interview in English
2. Wants an interviewer who speaks respondent’s first language

Q7SCR What is the **main** language which you speak at home?

1. English
2. Arabic
3. Cantonese
4. Greek
5. Italian
6. Mandarin
7. Spanish
8. Turkish
9. Vietnamese
10. Other (specify)

IF 2 IN Q6SCR MAKE AN APPOINTMENT FOR A CALL BACK BY A SPEAKER OF THE PREFERRED LANGUAGE.

IF 1 IN Q6SCR CONTINUE

SECTION 0: CONSENT FORMS

Q1CON One of the aims of this survey is to see how much electricity, gas and water households use, and relate this to the appliances they have and the size of the household.
To find out how much of these your household uses, we will need to get this information from your supplier. We need your permission to obtain this information.

If you are happy for us to collect this information, we will send you a consent form for you to complete and sign. The suppliers can then give us the information on the amounts used over the past year. To complete the form you will have to check details on a recent bill from each service provider, fill these in on the form and have it signed by a person named on a bill.

The information on the form and the signature are only being used for this study. Nothing in the information passed on to IPART will allow an individual household to be identified.

Q2CON We would very much like that you give permission for us to obtain information on your electricity, gas and water consumption by signing the form.

Would you be willing to sign the form to authorise obtaining information on your electricity, water use and/ or gas use?

1. Will sign authorisation and return to Taverner
2. Unwilling or unable to sign authorisation **- TERMINATE**

Q3CON The form asks for you to fill in the account holder's details and a unique reference number which may be referred to either as an account number, DPI number or NMI number. You will need to be able to find these on your bill.

NOTE TO INTERVIEWER – DPI means Delivery Point Identifier and is printed on the gas account. NMI means National Metering Identifier and is printed on the electricity account.

Do you think you can locate recent bills for your water, electricity and any gas service, fill in the form with service details and have the right person sign the form?

INTERVIEWER NOTE: IF TENANT AND UNABLE TO PROVIDE WATER BILL DETAILS BUT ABLE TO PROVIDE ALL OTHER BILLING DETAILS CODE AS 1.

1. Able to find the bills for all services (note tenants will not usually be able to find water bills)
2. Not sure if able to find a recent bill for one or more services **- TERMINATE**
3. Does not wish to continue **- TERMINATE**

SECTION 1: ELECTRICITY AND GAS MARKETS

SECTION 1.1: ELECTRICITY MARKETS

Q2A_EG From January 2002 all households in NSW have been able to choose the company they buy their electricity from. Were you aware of this?

1. Yes
2. No
9. Don't know

Q3a_EG Which company do you buy electricity from at the moment?

DO NOT PROMPT (SINGLE RESPONSE)

1. AGL Sales Pty Limited
2. Australian Power and Gas (NSW) Pty Ltd
3. Country Energy
4. EnergyAustralia
5. Integral Energy Australia
6. Jackgreen
7. Origin Energy Electricity Ltd
8. Powerdirect Pty Ltd
9. Red Energy Pty Ltd
10. TRUenergy Pty Ltd
98. Other (specify Q3AEG1)
99. Don't know / Can't recall

Q3b_EG How many other companies do you think you **could** buy electricity from?

1. None
2. 1 - 3
3. More than 3
4. Don't know / Can't recall
5. Not interested in other suppliers

Q5_EG Have you been approached in the last 3 years by your current electricity retailer or another electricity retailer to change supplier or to change the tariff arrangements for purchase of electricity?

IF YES PROBE: What form did that approach take? Was that approach a general notice attached to or enclosed with a bill?

Interviewer note: 'Approach' must be a phone call, visit, a specific letter addressed to occupants, a flyer in the letter box, or an invitation to ask for an offer when moving house. A general notice attached to a bill is not defined as an 'approach'.

1. Yes
2. No **SKIP TO Q8_EG**
3. Don't know / Can't recall **SKIP TO Q8_EG**

Q6a_EG Was it: ***READ OUT***

1. Your current retailer
2. Another retailer
3. Both

Q6b_EG As a result, did you …

READ OUT

1. Change retailer
2. Enter into new arrangements with your existing retailer
3. Stay with your existing retailer with the existing arrangements
4. Don't know / Can't recall

Q8_EG In the last 3 years have **you** approached any companies to ask about buying your electricity from them?

IF YES, PROBE: What prompted you to make that approach?

Interviewer note: MUST BE ENQUIRIES ABOUT CONTRACTS not because they were moving house

1. Yes
2. No **SKIP TO CONDITION PRIOR TO Q18A_EG**
3. Don't know / Can't recall **SKIP TO CONDITION PRIOR TO Q18A_EG**

Q9a_EG Was it: ***READ OUT***

1. Your current retailer
2. Another retailer
3. Both

Q9b_EG As a result, did you …

READ OUT

1. Change retailer
2. Enter into new arrangements with your existing retailer
3. Stay with your existing retailer with the existing arrangements
4. Don't know / Can't recall

IF 1-2 IN Q6B_EG AND/ OR 1-2 IN Q9B_EG ASK Q18A_EG, ELSE GO TO CONDITION PRIOR TO Q20A_EG

[ASK Q18A_EG IF CHANGED RETAILER/ ENTERED NEW ARRANGEMENTS IN Q6B_EG AND/ OR Q9B_EG]

Q18a_EG What was the main reason that you changed retailer/ entered into new arrangements with the company that sells electricity to your home?

DO NOT PROMPT (SINGLE RESPONSE)

1. It was cheaper
2. It offered a combined electricity and gas bill
3. The salesperson was persuasive
4. The other supplier offered better service
5. I was unhappy with my previous supplier
6. It offered other perks (Magazines, DVD, etc)
7. It offered green energy
8. Other (specify) _____
9. Don't know

Q19a_EG And what happened to your electricity bills after you changed retailer/ entered into new arrangements?

1. They stayed the same
2. They went down
3. They went up but not by as much as if I had not changed
4. They went up
5. Don't know / can't remember

IF 3 IN Q6B_EG AND/ OR 3-4 IN Q9B_EG ASK Q20A_EG
IF 3-4 IN Q6B_EG AND/ OR 3 IN Q9B_EG ASK Q20A_EG

[ASK Q20A_EG IF STAYED WITH EXISTING RETAILER WITH THE EXISTING ARRANGEMENTS IN Q6B_EG AND/OR Q9B_EG]

Q20a_EG What was the main reason that you did not change retailer/ enter into new arrangements with a company that could sell electricity to your home?

DO NOT PROMPT (SINGLE RESPONSE)

1. It was no cheaper
2. I was happy with my current supplier
3. I had never heard of the other supplier
4. It was too much trouble to switch
5. I did not want to be locked into a contract
6. I did not like being pushed by salesman
7. I did not have enough information
8. Other (specify) _____
9. Don't know

IF 1-2 IN Q6B_EG AND/ OR 1-2 IN Q9B_EG ASK Q21A_EG, ELSE GO TO Q11_EG

[ASK Q21A_EG IF CHANGED RETAILER/ ENTERED NEW ARRANGEMENTS IN Q6B_EG AND/ OR Q9B_EG]

Q21a_EG I'd like you to think about your new electricity tariff or supplier arrangements and I'd like you to rate your satisfaction with various aspects of it. Please use a scale of 1 to 7 where 1 means 'very dissatisfied' and 7 means 'very satisfied'. How satisfied were you with the extent to which these arrangements have met your expectations? *(READ OUT) (NA = 8, DK = 9)*?

1. 1 Very dissatisfied
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 Very satisfied
8. Not Applicable
9. Don't Know

IF 8 OR 9 IN Q21a_EG SKIP TO Q11_EG, OTHERWISE CONTINUE.

Q21b_EG Why did you give the extent to which these arrangements have met your expectations a rating of [Q21a_EG]? ***(RECORD VERBATIM)***

ASK ALL

Q11_EG In total, how many times have you changed the company that sells electricity to your home **since January 2002**?

INTERVIEWER NOTE: DO NOT INCLUDE CHANGES DUE TO MOVING HOUSE.

0. 0
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. More than 10
98. Refused
99. Don't know/ Can't remember

SECTION 1.2: GAS MARKETS

Q1_EG Do you use gas, either mains or cylinder gas, for your regular household heating or cooking?

IF CYLINDER CHECK: Is that a large cylinder set up outside the dwelling – one that is not portable?
IF SMALL OR PORTABLE DO NOT USE CODE 2, INSTEAD USE CODE 3

Interviewer note: Cylinder must be outside and non-portable

1. Yes, mains
2. Yes, cylinder (large, not portable) - **GO TO Q23_EGPRE**
3. No - **GO TO Q23_EGPRE**
4. Don't know - **GO TO Q23_EGPRE**

IF NOT 1 IN Q1_EG GO TO Q23_EGPRE

Q2B_EG From January 2002 all households in NSW have been able to choose the company they buy their gas from. Were you aware of this?

1. Yes
2. No
9. Don't know

Q4a_EG Which company do you buy gas from at the moment?

DO NOT PROMPT (SINGLE RESPONSE)

NOTE: IF QUERIED, "JEMENA" MANAGES ALL THE BILLING AND CONSUMPTION DATA FOR GAS SUPPLIERS IN SYDNEY.

1. AGL Retail Energy Ltd
2. Country Energy
3. EnergyAustralia
4. Integral Energy Australia
5. Origin Energy LPG Limited
6. TRUenergy Pty Ltd
98. Other (specify Q4AEG1)
99. Don't know/ Can't recall

Q4b_EG How many other companies do you think you **could** buy gas from?

1. None
2. 1 - 3
3. More than 3
4. Don't know / Can't recall
5. Not interested in other supplier

Q12_EG In the last 3 years have you been approached by your current gas supplier or another gas supplier to change supplier or to change the tariff arrangements for purchase of gas?

IF YES PROBE: What form did that approach take? Was that approach a general notice attached to or enclosed with a bill?

'Approach' must be a phone call, visit, a specific letter addressed to occupants, a flyer in the letter box or an invitation to ask for an offer when moving house. A general notice attached to a bill is not defined as an 'approach'.

1. Yes
2. No - **SKIP TO Q15_EG**
3. Don't know / Can't recall - **SKIP TO Q15_EG**

Q13a_EG Was it:

READ OUT

1. Your current retailer
2. Another retailer
3. Both

Q13b_EG As a result, did you …

READ OUT

1. Change retailer
2. Enter into new arrangements with your existing retailer
3. Stay with your existing retailer with the existing arrangements
4. Don't know / Can't recall

Q15_EG In the last 3 years have **you** approached any companies to ask about buying your gas from them?

IF YES PROBE: What prompted you to make that approach?

Interviewer note: MUST BE ENQUIRIES ABOUT CONTRACTS not because they were moving house or connecting new gas supply

1. Yes
2. No – SKIP TO CONDITION PRIOR TO Q18B_EG
3. Don't know / Can't recall – SKIP TO CONDITION PRIOR TO Q18B_EG

Q16a_EG Was it:

READ OUT

1. Your current retailer
2. Another retailer
3. Both

Q16b_EG As a result, did you …

READ OUT

1. Change retailer
2. Enter into new arrangements with your existing retailer
3. Stay with your existing retailer with the existing arrangements
4. Don’t know / Can’t recall

IF 1-2 IN Q13B_EG AND/ OR 1-2 IN Q16B_EG ASK Q18B_EG, ELSE GO TO CONDITION PRIOR TO Q20B_EG

[ASK Q18B_EG IF CHANGED RETAILER/ ENTERED NEW ARRANGEMENTS IN Q13B_EG AND/ OR Q16B_EG]

Q18b_EG What was the main reason that you changed retailer/ entered into new arrangements with the company that sells gas to your home?

DO NOT PROMPT (SINGLE RESPONSE)

1. It was cheaper
2. It offered a combined electricity and gas bill
3. The salesperson was persuasive
4. The other supplier offered better service
5. I was unhappy with my previous supplier
6. It offered other perks (Magazines, DVD, etc)
7. It offered green energy
8. Other (specify) _____
9. Don't know

Q19b_EG And what happened to your gas bills after you changed retailer/ entered into new arrangements~~?~~

1. They stayed the same
2. They went down
3. They went up but not by as much as if I had not changed
4. They went up
5. Don't know / can't remember

IF 3 IN Q13B_EG AND/ OR 3-4 IN Q16B_EG ASK Q20B_EG
IF 3-4 IN Q13B_EG AND/ OR 3 IN Q16B_EG ASK Q20B_EG

[ASK Q20B_EG IF STAYED WITH EXISTING RETAILER WITH THE EXISTING ARRANGEMENTS IN Q13B_EG AND/OR Q16B_EG]

Q20b_EG What was the main reason that you did not change retailer/ enter into new arrangements with a new company that could sell gas to your home?

DO NOT PROMPT (SINGLE RESPONSE)

1. It was no cheaper
2. I was happy with my current supplier
3. I had never heard of the other supplier
4. It was too much trouble to switch
5. I did not want to be locked into a contract
6. I did not like being pushed by salesman
7. I did not have enough information
8. Other (specify) _____
9. Don't know

IF 1-2 IN Q13B_EG AND/ OR 1-2 IN Q16B_EG ASK Q22A_EGPRE, ELSE GO TO Q17_EG

[ASK Q22A_EGPRE IF CHANGED RETAILER/ ENTERED NEW ARRANGEMENTS IN Q13B_EG AND/ OR Q16B_EG]

Q22a_EGPRE And for your new gas tariff or supplier arrangements. How would you rate your satisfaction with the extent to which these arrangements have met your expectations?

READ OUT

(Please use the same scale, where 1 means 'very dissatisfied' and 7 means 'very satisfied'

1. 1 Very dissatisfied
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 Very satisfied
8. Not Applicable
9. Don't Know

IF Q22a_EGPRE IS NOT APPLICABLE OR DON'T KNOW, SKIP TO Q17_EG. OTHERWISE CONTINUE.

Q22b Why did you give the extent to which these arrangements have met your expectations a rating of [*Q22a_EGPRE*]? ***(RECORD VERBATIM)***

Q17_EG In total, how many times have you changed the company that sells gas to your home **since January 2002**?

INTERVIEWER NOTE: DO NOT INCLUDE CHANGES DUE TO MOVING HOUSE.

0. 0
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. More than 10
98. Refused
99. Don't know/ Can't remember

ASK ALL

SECTION 1.3: SUMMARY OF OPINIONS ON FRC

Q23_EGPRE Now I'd like to ask you a few questions about your feelings towards competition in the electricity and gas markets in New South Wales.

1. CONTINUE

Q23_EG. Using a scale of 1 to 7, where 1 means 'not at all confident' and 7 means 'extremely confident', how confident would you say you are in being able to choose your electricity (or gas) retailer?

1. 1 Not at all confident
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 Extremely confident
8. Not Applicable
9. Don't Know

Q24_EG And how about your confidence in being able to get enough information to make an informed choice? Please use the same scale *(IF NECESSARY 1 to 7, where 1 means 'not at all confident' and 7 means 'extremely confident')*

1. 1 Not at all confident
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 Extremely confident
8. Not Applicable
9. Don't Know

Q25_EG How confident are you about the process of transferring from your current supplier to another supplier. Again please use a scale of 1 to 7 *(IF NECESSARY 1 to 7, where 1 means 'not at all confident' and 7 means 'extremely confident')*

1. 1 Not at all confident
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 Extremely confident
8. Not Applicable
9. Don't Know

Problems and Complaints

I just have a quick question to ask you about dealing with complaints and problems.

Q26_EG If you had a reason to complain about your electricity or gas retailer, who would you go to?

(DO NOT PROMPT) (SINGLE RESPONSE)

1. Retailer / Supplier
2. Energy and Water Ombudsman NSW (EWON)
3. State government
4. MP
5. Lawyer
6. Other (specify) _____
9. Don't know

SECTION 2: HOT WATER SYSTEMS

Q1_HW What is the main energy source used in your home for HOT WATER?

SINGLE RESPONSE

IF REPLIES "SOLAR" PROBE: Is the solar hot water system boosted with electricity or with gas?

1. Electric - **CONTINUE**
2. Gas - **SKIP TO Q1_HA**
3. Solar – no further information given - **SKIP TO Q1_HA**
4. Solar only - **SKIP TO Q1_HA**
5. Solar - Electric boosted - **CONTINUE**
6. Solar - Gas boosted - **SKIP TO Q1_HA**
7. Wood, solid fuel - **SKIP TO Q1_HA**
8. Other (specify) _____ **SKIP TO Q1_HA**
9. Don't know - **SKIP TO Q1_HA**

[IF ELECTRIC (1 or 5 in Q1_HW) CONTINUE, OTHERWISE SKIP TO Q1_HA]

IF NOT 1 AND NOT 5 IN Q1_HW GO TO Q1_HA

Q2_HW Is that an off-peak system or a standard electric water heater?

IF RESPONDENT UNSURE WHETHER SYSTEM IS OFF PEAK EXPLAIN:

Off-peak' is a water heater in which water is only heated at night. Your electricity bill will indicate if your water heater is off-peak.

1. Off-peak
2. Standard electric
9. Don't know

SECTION 3: HOUSEHOLD APPLIANCES

Q1_HA What is (are) the main energy source(s) used in your home for COOKING?

(MULTIPLE RESPONSES ACCEPTED)

1. Electricity
2. Gas
3. Other (specify)
9. Don't know; E

GRID [ASK Q2R_HA FOR EACH Q2L_HA]
Q2L_HA
1. Clothes dryer
2. Dishwasher
3. Washing machine
4. Microwave

Q2R_HA How often do you usually use these appliances in your home per week?
How about ... [Q2L_HA]?

1. <1
2. 1-2
3. 3-5
4. 6+
8. Not Applicable/ Don't have one
9. Don't Know
END GRID

Q3_HA Do you have a second refrigerator?

1. Yes

2. No - **SKIP TO Q1_HT**
9. Don't know / Can't recall - **SKIP TO Q1_HT**

Q4_HA For how many weeks per year would your second refrigerator be turned on?

IF UNSURE ENTER 99. IF REFUSED ENTER 98.

_____

SECTION 4: HEATING AND COOLING

Q1_HT What kinds of room heating do you have?

PROMPT IF NECESSARY. (MULTIPLES ACCEPTED)

1. Reverse cycle air-conditioning
2. Electric (not air-conditioning)
3. Gas
4. Oil
5. Wood, solid fuel
6. Kerosene
7. Ducted air (i.e. central heating in multi-dwelling unit)
8. Other (specify) _____
9. No heating; E
10. Don't know; E

[IF MORE THAN ONE TYPE OF HEATING CONTINUE TO Q2_HT. OTHERWISE SKIP TO Q3_HT]

IF ONLY ONE REPLY IN Q1_HT GO TO Q3_HT

Q2_HT Which kind of heating do you use most often?

(SINGLE RESPONSE) – USE ANSWERS PROVIDED IN Q1_HT

1. Reverse cycle air-conditioning
2. Electric (not air-conditioning)
3. Gas
4. Oil
5. Wood, solid fuel
6. Kerosene
7. Ducted air (i.e. central heating in multi-dwelling unit)
8. Other (specify) _____
10. Don't know

Q3_HT Apart from electric fans, do you have any air-conditioning or air cooling in this dwelling?

1. Yes
2. No **– GO TO Q10_HT**
9. Don't know / Can't recall **– GO TO Q10_HT**

Q5a_HT How often, on average, do you use your air-conditioner in summer (for cooling)?

1. Less than 1 day per month
2. Less than 1 day per week
3. 1-2 days per week
4. 3-4 days per week
5. More than 4 days per week
6. Do not use in summer
8. Not applicable

9. Don't know

[IF REVERSE CYCLE IN Q1_HT, CONTINUE. OTHERWISE SKIP TO Q6L_HT]

IF NOT 1 IN Q1_HT GO TO Q6L_HT

Q5b_HT And in winter (for heating)?

1. Less than 1 day per month
2. Less than 1 day per week
3. 1-2 days per week
4. 3-4 days per week
5. More than 4 days per week
6. Do not use in winter
8. Not applicable
9. Don't know

GRID [ASK Q6R_HT FOR EACH Q6L_HT]
Q6L_HT

1. summer weekdays?
2. summer weekends or holidays?

Q6R_HT On summer days when you use your air-conditioner, how many hours do you usually switch it on for on [Q6L_HT]?

1. Less than 2 hours
2. 2 to 5 hours
3. 5 to 10 hours
4. 10 to 20 hours
5. More than 20 hours
6. Do not use
8. Not applicable
9. Don’t know

END GRID

ASK Q7_HT ONLY IF HAVE REVERSE CYCLE IN Q1_HT. OTHERWISE SKIP TO Q10_HT.

GRID [ASK Q7R_HT FOR EACH Q7L_HT]
Q7L_HT
1. winter weekdays?
2. winter weekends or holidays?

Q7R_HT On winter days when you use your reverse cycle air-conditioner for heating, how many hours do you usually switch it on for on [Q7L_HT]?

1. Less than 2 hours
2. 2 to 5 hours
3. 5 to 10 hours
4. 10 to 20 hours
5. More than 20 hours
6. Do not use
8. Not applicable
9. Don’t know

END GRID

ASK ALL

Q10_HT Does your house have ceiling insulation?

IF YES, ASK: Has it been installed in the past twelve months?

(PROBE TO ENABLE CODING)

1. Yes – installed in last twelve months
2. Yes – installed more than 12 months ago
3. Yes – not sure how long ago
4. No – does not have ceiling insulation
5. Unsure whether house has ceiling insulation

SECTION 5: WATER USE

Q1C_W How many toilets do you have?

IF DON'T KNOW ENTER 'D'
IF REFUSED ENTER 'R'
IF NONE ENTER 0

_____

IF DK OR REFUSED IN Q1C_W SKIP TO Q2_W

IF 1 IN Q1C_W ASK Q1D_W, ELSE GO TO Q1E_W

Q1D_W Is the toilet … ***READ OUT***

1. Single flush
2. Dual flush
3. Don't know

IF 2 OR MORE TOILETS IN Q1C_W ASK Q1E_W

Q1E_W How many of them are dual flush?

IF DON'T KNOW ENTER 'D'
IF REFUSED ENTER 'R'
IF NONE ENTER 0

_____

Q2_W How many indoor showers do you have? (ENTER NUMBER)

_____

0. None
9. Don't know / Can't recall

Q3_W Which of these items do you have?

(read out codes 1-6. ACCEPT MULTIPLES)

1. Bath
2. Bath with spa jets
3. Spa
4. Swimming pool
5. Sauna
6. A garden – **ASK Q4_W**
7. None of the above; E
9. (Don't know); E

IF NOT 6 IN Q3_W SKIP TO Q5_W

Q4_W Which of these methods do you usually use for watering your garden?

(ACCEPT MULTIPLES)

1. Hand held hose with trigger nozzle
2. Portable sprinkler
3. Automatic sprinkler system
5. Other (specify) _____
6. Never water the garden;E
7. No garden;E
9. (Don't know);E

Q5_W Do you regularly use water for washing the car?

1. Yes
2. No
9. (Don’t Know)

GRID [ASK Q6R_W FOR EACH Q6L_W]
Q6L_W WATER SOURCES
1. Bore
2. Grey water (i.e. from washing machines)
3. Rain water from tank

Q6R_W Do you use water from any of the following sources …

READ OUT

[Q6L_W]

1. Yes, outside only
2. Yes, inside for flushing the toilet only
3. Yes, inside for other purposes
4. Yes, outside and inside
5. No
9. (Don't know)
END GRID

Q2HHN Do you (i.e. your household) pay for the quarterly water usage charges?

1. Yes
2. No
8. (Not applicable)
9. (Don't know/ Can't recall)

GRID [ASK Q7R_W FOR EACH Q7L_W – AS APPLICABLE]
Q7L_W
1. Customer service [IF 1 IN Q2HHN]
2. Pressure of the water
3. Flexibility of the billing arrangements [IF 1 IN Q2HHN]
4. Quality of the water
5. Continuity of the water supply
6. Incentives to reduce water use [IF 1 IN Q2HHN]
7. Good environmental management of water
8. Overall cost [IF 1 IN Q2HHN]

Q7R_W I'd like you to rate the importance of the following items in terms of your water services. Using a scale of 1 to 7, where 1 is 'very unimportant' and 7 is 'very important', how important is [Q7L_W]?

1. 1 Very unimportant
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7 Very important
8. Not Applicable
9. Don't Know

END GRID

IF 1 IN Q2HHN ASK Q9_W. ELSE SKIP TO Q1_PT

Q9_W Do you think Sydney Water's services represents value for money?

1. Yes
2. No
9. Don't know

SECTION 6: PUBLIC TRANSPORT

Q1_PT Are there any registered vehicles, whether private or company owned, used by your household and usually parked here overnight?
IF YES, ASK: How many?
ENTER NUMBER. IF NONE ENTER ZERO.

Q2_PT Did you, or anyone in your household, use public transport in the last 7 days?
That might have been a bus, a train, a ferry or a taxi.

1. Yes
2. No **– GO TO Q1_HH**
9. Don't know **– GO TO Q1_HH**

IF 2 OR 9 IN Q2_PT GO TO Q1_HH

Q2a_PT Was it …

(READ OUT 1-7. MULTIPLES ACCEPTED)

1. Bus (free school travel)
2. Train (free school travel)
3. Ferry (free school travel)
4. Bus
5. Train
6. Ferry
7. Taxi
8. Don't know/ Can't recall; E

SECTION 7: RESIDENCE INFORMATION

Q1_HH Is this dwelling owned fully or being paid off by you or any of the usual residents of this household or are you renting or paying board?

IF RENTING, ASK: "Is that a Housing NSW rental or a private rental?"

1. Owned fully / fully paid off - **GO TO Q3_HH**
2. Buying / paying off home - **GO TO Q3_HH**

3. Renting – private - **CONTINUE**
4. Renting – public / e.g. Housing NSW - **CONTINUE**
5. Boarding - **GO TO Q3_HH**
6. Other - **GO TO Q3_HH**

Q2_HH AUTOMATICALLY RECORDS ANSWERS COLLECTED IN Q2HHN – QUESTION IS NOT BEING ASKED

1. Yes
2. No
8. Not applicable
9. Don't know / Can't recall

Q3_HH How many times have you moved house in the past three years?

IF UNSURE ENTER 99
IF NONE ENTER 0
IF REFUSED ENTER 98

_____

Q4_HH How many bedrooms are in this dwelling, including any rooms that can be used as either a bedroom or a study?

IF UNSURE ENTER 9
IF NONE ENTER 0

_____

SECTION 8: CONCESSION CARD INFORMATION

Q1_CC. Do you hold any of the following concession cards?

READ OUT (CLARIFY THAT THIS DOES NOT INCLUDE THE SENIORS CARD)

1. Pensioner Concession Card
2. Veterans' Affairs Gold Health Card
3. Have a concession card but not sure what it is called
4. No - **SKIP TO Q1LA_PD**

GRID [ASK Q2_CC TO Q3_CC FOR Q2L_CC]

Q2L_CC
1. Energy
2. Water

Q2_CC. Are you aware that concessions are available to concession card holders for payment of [Q2L_CC] bills?

NOTE TO INTERVIEWER: ENERGY CONCESSIONS APPEAR ON THE ELECTRICITY ACCOUNT ONLY

1. Yes
2. No
3. Don't know

[IF YES TO ANY OF ABOVE, CONTINUE. OTHERWISE SKIP TO SECTION Q1LA_PD.]

IF 1 IN Q2_CC SKIP TO Q3_CC, OTHERWISE GO TO Q1LA_PD

Q3_CC. Do you, or does anyone in your household, currently claim the concessions for your [Q2L_CC] bill?

1. Yes
2. No
3. Don't know
4. Does not pay water bills

END GRID

SECTION 9: PAYMENT DIFFICULTIES

GRID [ASK Q1Ra_PD TO Q3R_PD FOR EACH OF Q1LaPD – IF APPLICABLE]
Q1La_PD
1. Electricity
2. [IF 1 IN Q2HHN] Water
3. [IF 1 IN Q1_EG] Gas

Q1Ra_PD Have you felt financially unable to pay your [Q1La_pd] bills at any stage over the last three years?

1. Yes
2. No
8. Refused
9. Don't know

IF YES TO Q1Ra_PD, CONTINUE. OTHERWISE SKIP TO Q1_CL

Q1Rb_PD Did this occur within the past year?

NOTE - IF NECESSARY, SAY: We are referring to [q1lapd] bill.

1. Yes
2. No
3. Not applicable
8. Refused
9. Don't know

Q2R_PD Have you approached your supplier of [Q1La_PD] because you have been financially unable to pay your bills in the past three years?

1. Yes
2. No
8. Refused
9. Don't know

IF 1 IN Q2R_PD CONTINUE. OTHERWISE SKIP TO Q4_PD

Q3R_PD What sort of help did the [Q1La_PD] supplier offer?

(DO NOT READ OUT)

1. Allowed to pay off in instalments
2. Extended the due date on the bill
3. Referred me to an emergency relief agency
4. Referred me to a financial counsellor

5. No help offered;E
6. Other (specify)
8. Not applicable
9. Don't know;E
END GRID

IF UNABLE TO PAY ELECTRICITY AND/ OR GAS BILL ASK Q4_PD, OTHERWISE GO TO CONDITION PRIOR TO Q6_PD

Q4_PD The NSW government funds a programme where community welfare organisations, such as St Vincent de Paul or the Salvation Army, distribute Energy Accounts Payment Assistance (EAPA) vouchers to help people in emergency or crisis situations pay their electricity or gas bills. In the past three years, have you received any EAPA vouchers to help pay your electricity or gas bills?

1. Yes
2. No
8. Refused
9. Don't know

IF 2 in Q4_PD ASK Q5_PD, OTHERWISE SKIP TO Q6_PD

Q5_PD In the past three years, have you been in need of EAPA vouchers but have not used them because:

1. Hadn’t been aware of them
2. Didn’t know where to get them
3. Felt uncomfortable about approaching a charity
4. Got money from elsewhere
5. Paid bill late instead
6. Did not qualify for EAPA
7. Did not receive vouchers in time
8. Not applicable
88. Refused
99. Don't know

IF UNABLE TO PAY WATER BILL ASK Q6_PD, OTHERWISE GO TO Q8L_PD

Q6_PD The NSW government also funds a programme where community welfare organisations, such as St Vincent de Paul or the Salvation Army, distribute vouchers to help people in emergency or crisis situations pay their water bills. In the past three years, have you received any of these vouchers to help pay your water bills?

1. Yes
2. No
8. Refused
9. Don't know

IF 2 in Q6_PD ASK Q7_PD, OTHERWISE SKIP TO Q8L_PD

Q7_PD In the past three years, have you been in need of water bill vouchers but have not used them because:

1. Hadn’t been aware of them

2. Didn’t know where to get them
3. Felt uncomfortable about approaching a charity
4. Got money from elsewhere
5. Paid bill late instead
6. Did not qualify
7. Did not receive vouchers in time
8. Not applicable
88. Refused
99. Don't know

GRID [ASK Q8R_PD FOR EACH OF Q8L_PD]
Q8L_PD

1. [IF 1 IN Q1RA_PD for electricity] Electricity disconnected
2. [IF 1 IN Q1RA_PD for water] Water restricted
3. [IF 1 IN Q1Ra_PD for gas] Gas disconnected

Q8R_PD In the past three years, have you had the electricity [Q8L_PD] for not paying your bill?

1. Yes
2. No
8. Refused
9. Don't know
END GRID

SECTION 10: CLASSIFICATION DATA

Q1_CL (RECORD GENDER AUTOMATICALLY)

1. Male
2. Female

Q2_CL Which one of the following age groups do you belong to?

READ OUT

1. 18 to 24
2. 25 to 34
3. 35 to 44
4. 45 to 54
5. 55 to 64
6. 65 or over
98. Refused
99. Don’t know

Q3_CL What is the total number of people in this household including yourself?
IF REFUSED ENTER 88. IF UNSURE ENTER 99

_____

Q4_CL How many are aged 15 and over?
IF REFUSED ENTER 88. IF UNSURE ENTER 99.

_____

Q5_CL How many are aged less than 15 years?
IF REFUSED ENTER 88. IF UNSURE ENTER 99. IF NONE ENTER 0

_____

Q6_CL How many would spend most days of the week at home, including any infant children that live there?

IF REFUSED ENTER 88. IF UNSURE ENTER 99. IF NONE ENTER 0

_____

Q7a_CL Which of the following would best describe your household structure?

READ OUT CODES 1-4

1. Single person living alone **- GO TO Q8_CL**
2. Single parent
3. Couple living with children
4. Couple with no children at home
6. Other (specify) - **GO TO Q8_CL**
7. Refused - **GO TO Q8_CL**
8. Don't know / Can't recall **- GO TO Q8_CL**

Q7b_CL And which of the following would best describe your household?

IF 2 OR 3 IN Q7a_CL DISPLAY CODES 1-3 AND 6-8

IF 4 IN Q7a_CL DISPLAY CODES 4-8

1. Most of your children are pre-school aged, under 6
2. Most of your children are aged from 6 to 15 years and still at home
3. Most of your children who are still living at home are aged over 15
4. A young couple with no children at home
5. A family or couple in middle or mature age with no children living at home
6. Other (specify)
7. Refused
8. Don't know / Can't recall

Q8_CL Could you please tell me which of the following best describes the total income before taxes of this household last year?
Please include income from all sources, including salaries, interest, dividends, bonuses, capital gains, profits, Centrelink payments and so on.

IF RESPONDENT REFUSES, SAY: This information is important because the Tribunal needs to understand the impacts of price changes on the various customer groups, including pensioners and low-income households. One of the main purposes of this survey is to find out how much water, gas and electricity is used in different income groups.

1. Less than $250 per week (under $7,800 per year)
2. $250 to $349 per week ($7,800 to under $18,200 per year)
3. $350 to $649 per week ($18,200 to under $33,800 per year)
4. $650 to $799 per week ($ 33,800 to under $ 41,600 per year)
5. $800 to $1,199 per week ($ 41,600 to under $62,400 per year)
6. $1,200 to $1,699 per week ($ 62,400 to under $88,400 per year)
7. $1,700 to $2,499 per week ($88,400 to under $130,000 per year)
8. $2,500 to $2,999 per week ($130,000 to under $156,000 per year)
9. $3,000 or more per week ($156,000 or more per year)
10. (Don't know)
11. (Refused)

Q9_CL CONTACT DETAILS
Just in case my supervisor needs to check or validate my work, could you please tell me the best telephone number to contact you on?

1. Enter number _____
2. Refused to give telephone number

Q10_CL RESPONDENT'S DETAILS

To help us make sure we get the right data for you household's use can you please start by giving me the exact account holder(s) details as they appear on the **electricity bill**?

And what is the exact address of the property on the electricity bill?

Mr / Mrs / Miss / Ms
FIRST NAME/ initial(s)
FAMILY NAME

UNIT #
STREET NUMBER AND NAME
SUBURB
POSTCODE

Q10a_CL And are the details on the **water bill** the same as the details on the electricity bills?

1. Yes - **GO TO Q10c_CL**
2. No - **CONTINUE**
3. Don't receive the water bill - **GO TO Q10c_CL**

Q10b_CL Can you please give me the account holder(s) details exactly as they appear on the water bill?

Mr / Mrs / Miss / Ms
FIRST NAME/ initial(s)
FAMILY NAME

IF 2-4 IN Q1_EG SKIP TO Q99ADD1

Q10c_CL And which of those is the same as the details on the **gas bill**?

SINGLE RESPONSE

READ OUT

1. Water is the same – **GO TO Q99ADD1**
2. Electricity is the same – **GO TO Q99ADD1**
3. Different to both Water and Electricity details
4. Same as both Water and Electricity details – **GO TO Q99ADD1**

Q10d_CL Can you please give me the account holder detail(s) exactly as they appear on the gas bill?

Mr / Mrs / Miss / Ms
FIRST NAME/ initial(s)
FAMILY NAME

Q99ADD1 Can we mail the letter and the consent form to the address provided for the **energy bill**?

1. Yes **– GO TO INTERVIEWER DECLARATION**
2. No

Q99ADD2 What is the address you would like us to send you the letter and consent form?

PLEASE DOUBLE CHECK SPELLING

NA = NOT APPLICABLE

UNIT #:
STREET #:
STREET NAME:
SUBURB:
POSTCODE:

INTERVIEWER, TIME AND DATE OF INTERVIEW AUTOMATICALLY LOGGED BY SYSTEM

INTERVIEWER DECLARATION:

I certify this is a correct record of the interview which has been completed in accordance with my interviewing guidelines and conducted according to the ICC / ESOMAR International Code of Marketing and Social Research Practice.

E Detailed survey results

Detailed results from the survey are available in Excel format on the IPART website at:
http://www.ipart.nsw.gov.au/investigation_content.asp?industry=6&sector=17&inquiry=202. Then follow the link to spreadsheet models.

The following data tables are available:

Table 1 All households by income

Table 2 All households by electricity consumption

Table 3 Households using electricity only by electricity consumption

Table 4 Households using electricity and gas by electricity consumption

Table 5 Households using mains gas by gas consumption

Table 6 All households by water consumption

Table 7 Free-standing houses only by water consumption

Table 8 Multi-unit dwellings by water consumption

Glossary

Adults	Persons 15 years and over
Amenities	Facilities including toilets, showers, baths, spas and swimming pools.
Appliances	Dishwasher, washing machine, clothes dryer, microwave oven, second refrigerator and air conditioner. The survey did not ask about entertainment appliances (such as VCRs, DVD players, TVs and stereos).
Bore water	Water from boreholes, pumped privately for individual use.
Children	Persons aged less than 15 years
CPI	Consumer Price Index, published by the Australian Bureau of Statistics
Cylinder Gas	Liquid petroleum gas (LPG) supplied in large gas cylinders that are connect to appliances in dwellings
EAPA	Energy Account Payment Assistance. NSW Government funded program to assist energy customers facing financial hardship. Administered by community welfare organisations.
Flats	Granny flats, 'low rise' flats (less than 3 storeys), flats (3 storeys) and 'high rise' flats (more than 3 storeys)
Free-standing house	Separate house not structurally attached to another dwelling. Combined dwelling/non-dwelling
Full retail competition (FRC)	Full retail competition for electricity and gas, introduced in NSW on 1 January 2002. From that time, residential customers have had the option to choose their electricity and/or gas retailer(s).
Gigajoules (GJ)	Unit of gas measurement equal to 1,000 MJ (megajoules) or 109 joules

Grey water	Wastewater generated from domestic activities such as laundry, dishwashing, and bathing, which can be recycled on-site.
High-income	Sydney (2010) survey: household income above $130,000 per year Sydney (2006) and Hunter, Gosford, Wyong (2008)surveys: household income above $104,000 per year
Higher-middle income	Sydney (2010) survey: household income between $62,400 and $130,000 per year Sydney (2006) and Hunter, Gosford, Wyong (2008)surveys: household income between $52,000 and $104,000 per year
House	Separate house, combined dwelling/non-dwelling
Household	A small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth, and who consume certain types of goods and services collectively, mainly housing and food (www.abs.gov.au).
Household income	Total income of the household (not respondent), before taxes, from all sources including income from salaries, interest, dividends, bonuses, capital gains, profits and so on
Indoor water using amenities and appliances	Facilities located inside the dwelling including toilets, showers, baths, baths with spa jets, dishwashers and washing machines.
Kilolitres (kL)	Unit of water measurement equal to 1,000 litres
Kilowatt hours (kWh)	Unit of electricity measurement equal to 1,000 watts
Large electricity/gas/ water users	For electricity, consumption above 12 MWh per year. For gas, consumption above 30 GJ per year. For water, consumption above 400 kL per year.
Large energy using appliances and amenities	Dishwasher, washing machine, clothes dryer, microwave oven, second refrigerator, swimming pool pump and air conditioner. The survey did not ask about entertainment appliances (such as VCRs, DVD players, TVs and stereos). Hot water systems were separately treated in the analysis.
Large land size	Land more than 900 square metres

Low-income	Sydney (2010) survey: household income below $33,800 per year Sydney (2006) and Hunter, Gosford, Wyong (2008)surveys: household income below $31,200 per year
Low-middle income	Sydney (2010) survey: household income between $33,800 and $62,400 per year Sydney (2006) and Hunter, Gosford, Wyong (2008)surveys: household income between $31,200 and $52,000 per year
Mains water	Water delivered through a network of pipelines ('water mains') by the water service provider.
Mains gas	Gas delivered through a network of pipelines ('gas mains') by the gas service provider.
Medium electricity/gas/ water users	For electricity, consumption between 4 MWh and 12 MWh per year. For gas, consumption between 10 GJ and 30 GJ per year. For water, consumption between 100 kL and 400 kL per year.
Medium land size	Land between 500 to 900 square metres
Megawatt hours (MWh)	Unit of electricity measurement equal to 1,000 kilowatt hours or 106 watt hours
Multi-unit dwelling	Semi-detached dwellings and flats
Off-peak hot water system	Hot water systems which heat water outside the most popular and expensive times (usually 10pm to 7am). Also know as a controlled load system (as the electricity network operator controls when water is heated).
PAS	Payment Assistance Scheme. NSW Government funded program to assist customers of Sydney Water and Hunter Water who are facing financial hardship. Administered by community welfare organisations.
Peak load	The amount of power required to supply customers at the busiest times. Also know as peak demand.
Renters	Customers paying rental for their primary place of residence
Residential customers	Customers in private dwellings, not including commercial and industrial customers

Renting – public	Renting residential properties provided by the NSW Government
Renting – private	Renting privately owned residential properties.
Semi-detached dwelling	Semi-detached or terrace house, villa unit, town house or duplex
Single dwellings (Sydney Water)	Sydney Water defines 'single dwellings' to include free-standing houses as well as semi-detached dwellings and terraces which are not strata or company titled.
Small electricity/gas/ water users	For electricity, consumption below 4 MWh per year. For gas, consumption below 10 GJ per year. For water, consumption below 100 kL per year.
Small land size	Land less than 500 square metres
Space heating or cooling	Heating or cooling the interior of a building.
Sydney metropolitan east	That part of the Sydney metropolitan area that is in EnergyAustralia's network area.
Sydney metropolitan west	That part of the Sydney metropolitan area that is in Integral Energy's network area.
SSTS	NSW Government's School Student Transport Scheme. Students on this scheme have special passes and travel free of charge.
Units or flats (Sydney Water term)	Sydney Water defines 'units or flats' to include flats (or units) as well as strata and company titled townhouses and duplexes