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DOMESTIC USE OF WATER AND ENERGY

SOUTH AUSTRALIA

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CONTENTS

INQUIRIES

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100 years of STATISTICS

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NOTES

ABOUT THIS PUBLICATION

This publication contains results from the Domestic Use of Water and Energy Survey conducted in South Australia (SA) in October 2004. It presents information on South Australians' behaviour in relation to water and energy use. The topics covered include plumbing of rainwater tanks into dwellings; presence of reduced flow shower heads; types of hot water systems, washing machines, heaters and air conditioners used; garden and lawn watering methods; water conservation actions in and around dwellings; and connections to gas.

ABOUT THE SURVEY

The survey was conducted as a supplement to the Australian Bureau of Statistics (ABS) Monthly Population Survey (MPS). Please refer to the Explanatory Notes at the back of this publication for further details about this survey.

ABBREVIATIONS

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ASGC	Australian Standard Geographical Classification
ATSI	Aboriginal and Torres Strait Islander
COAG	Council of Australian Governments
MPS	Monthly Population Survey
RSE	relative standard error
SA	South Australia
SE	standard error

Ian Crettenden
Regional Director

LIST OF GRAPHS AND TABLES

page

WATER USE AND CONSERVATION

GRAPHS

TABLES

page

ENERGY USE AND CONSERVATION

GRAPHS

TABLES

CHAPTER 1 INTRODUCTION AND MAIN FINDINGS

INTRODUCTION

The Domestic Use of Water and Energy Survey 2004, was conducted to inform South Australian State Government planning and decision making in relation to water and energy management. The State Government has introduced permanent water conservation measures in response to critical water shortages and in South Australia a tight demand-supply relationship exists for energy. Therefore, information on domestic use of water and energy use is of increasing importance for State Government management and sustainability planning.

The ABS appreciates the advice and funds, contributed by the following key stakeholders:

- Primary Industries and Resources SA
- SA Department of Environment and Heritage
- SA Department for Water, Land, Biodiversity and Conservation
- SA Water
- SA Department of Treasury and Finance
- Essential Services Commission of South Australia
- SA Department of Families and Communities
- Environment Protection Authority.

The main areas focused on in the survey were:

- household practices with regard to water and energy use and water conservation actions
- household use of water conserving devices and energy efficient appliances
- the relationship of these practices to household income.

This publication presents data on South Australians' domestic use and conservation of water and energy by tenure type and by equivalised gross household income quintiles (gross household income adjusted according to the number of persons in the household). Further data, including area of usual residence (Adelaide Statistical Division and the rest of the state) and household size, are available from the ABS. See the Appendix for a comprehensive list of data items.

MAIN FINDINGS

Water use and conservation

In October 2004, 28% of South Australian households had a rainwater tank plumbed into their dwelling and 37% reported they had a reduced flow shower head. Households that owned their dwellings were more likely to have these water-saving features than households that rented their dwellings.

Only 15% of households had front loading automatic washing machines, while those with higher incomes were more likely to have them than those with lower incomes.

Water use and conservation continued

In the 12 months to October 2004, 46% of households hand watered a garden and/or lawn, 35% used a fixed sprinkler system, 27% used a movable sprinkler and 10% reported using a timer. Hand watering was the only method used by 24% of households to water a garden and/or lawn. Fixed sprinkler systems were more likely to be used by dwelling owners or by households that had higher incomes.

Households' water conservation actions taken during the year included adjusting water levels when washing clothes or dishes (61% of households), using mulch (59%), taking less time when showering (54%), watering gardens and lawns using a soaking method (41%), recycling water (36%), planting drought tolerant plants or lawn (31%), not watering lawns (17%) and removing or reducing the size of lawns (16%).

Most of the water conservation actions undertaken by households in the 12 months to October 2004, had also been undertaken previously. Adjusting the water level when washing clothes or dishes was the most common action taken for the first time in the last 12 months (13% of households).

Energy use and conservation

In October 2004, mains and/or bottled gas was connected to 68% of South Australian households. Gas was more likely to be connected to households with higher incomes than those with lower incomes.

Gas was the main energy source for hot water systems in 50% of South Australian households. Electricity was the main source for 45% of households – peak electricity for 14% of households and off-peak electricity for 31% of households. Only 3% of households had solar hot water systems. Similar proportions of dwelling owners and renters used electric hot water systems; however, 34% of owners used off-peak electricity compared with 23% of renters.

The types of heating used most often by households were gas heaters (34% of households), reverse cycle air conditioners (26% of households) and electric heaters (18% of households). Renters were more likely to use electric heaters than owners. In addition, households with lower incomes were more likely to use electric heaters than those with higher incomes.

Almost 15% of households renting from a government housing authority and 8% of households in the lowest income quintile did not use a heater.

Over 80% of South Australian households had air conditioners which they used for heating or cooling. Dwelling owners and households with higher incomes were more likely to use an air conditioner.

Ducted air conditioning was the air conditioning used most often in 34% of South Australian households and air conditioning set in walls or windows was used most often in 31% of households. Ducted air conditioning was more common in owned dwellings whereas air conditioning set in walls or windows was more common in rented dwellings. Ducted air conditioning was also more common in households with higher incomes whereas air conditioning set in walls or windows was more common with lower income households.

CHAPTER 2 WATER USE AND CONSERVATION

INTRODUCTION

In 2000–01 water consumption by households was approximately 9% of total water consumption in Australia. In South Australia, 11% of all water consumption was by households (ABS 2004a).

Per capita household water consumption in South Australia was 123 kL compared with the national average of 115 kL (ABS 2004b). A large proportion of water used by households is for outdoor purposes (50% of South Australian households and 44% of Australian households in 2000–01) (ABS 2004a).

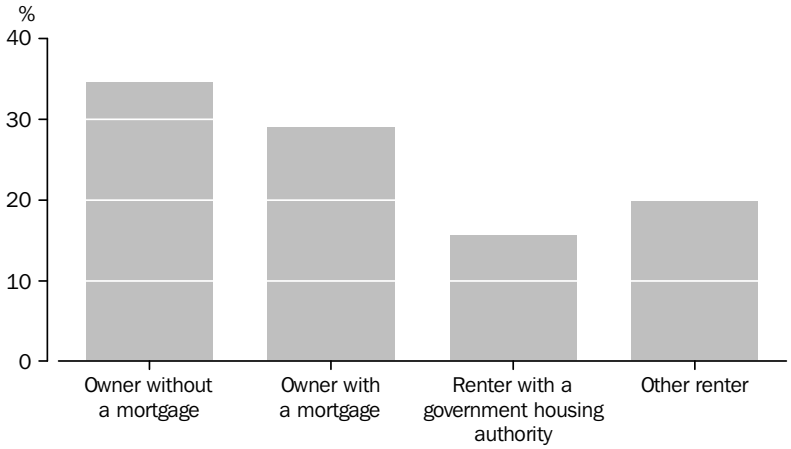
SURVEY RESULTS

Rainwater tanks

The majority of South Australians obtain water from a mains/town water supply (96%) (ABS 2004b). However, rainwater tanks are also used as a source for drinking, watering lawns and gardens, bathing, showering and washing. In March 2004, 48% of South Australian households reported using a rainwater tank as a source of water. This is almost three times the national average of 17% (ABS 2004b).

In October 2004, 178,600 South Australian households (or 28%) had a rainwater tank plumbed into their dwelling. Graph 2.1 shows the proportion of households that own or rent their dwelling and have a rainwater tank plumbed into the dwelling. The graph shows the proportions ranged from 16% for renters with a government housing authority to 35% for owners without a mortgage (tables 2.10 and 2.11).

2.1 RAINWATER TANK PLUMBED INTO DWELLING, By tenure type



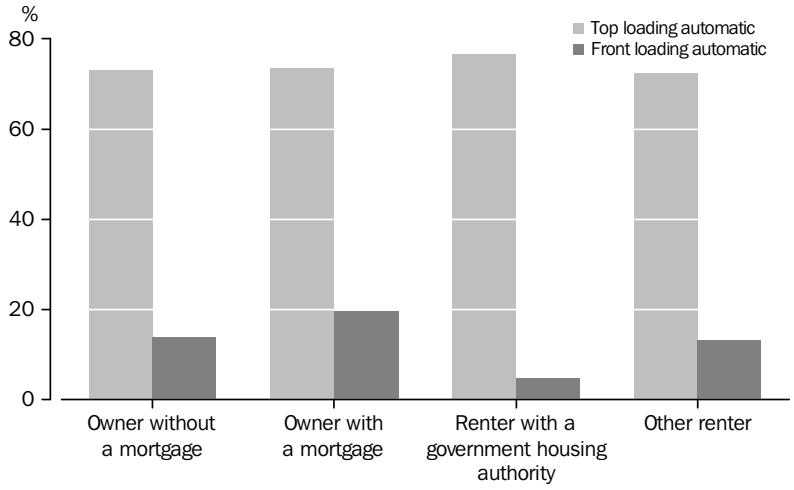
Washing machines

There are two main types of washing machines used in Australia. Top loading washing machines (sometimes called agitator or impeller machines) and front loading washing machines (also referred to as drum type machines) (Australian Greenhouse Office 2003).

In October 2004, 73% of all South Australian households (465,600) had a top loading automatic washing machine compared with 15% who had a front loading automatic washing machine (tables 2.12 and 2.13). The remaining households either had another type of washing machine (e.g. twin tub) or did not have a washing machine.

Ownership of top loading automatic washing machines was similar between tenure types, ranging from 72% for other renters (i.e. not renting from a government housing authority) to 77% for renters with a government housing authority. However, there was more variation in ownership of front loading automatic washing machines, which ranged from 5% of renters with a government housing authority to 20% of owners with a mortgage (graph 2.2).

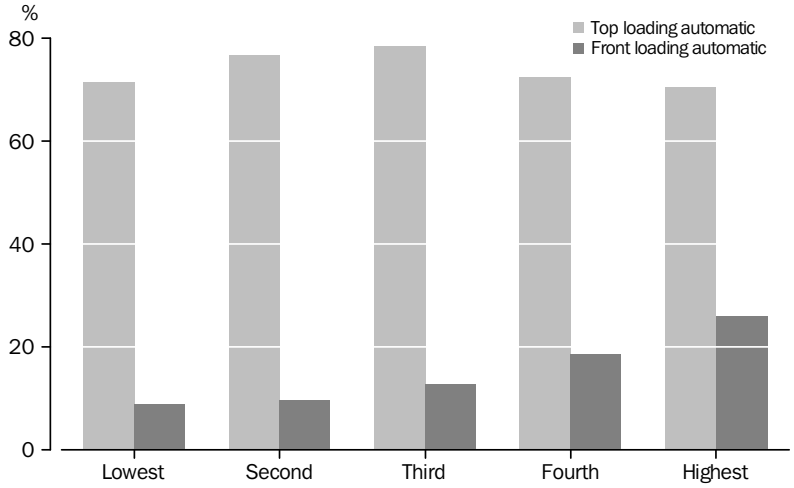
2.2 WASHING MACHINE TYPE, By tenure type



Graph 2.3 shows the relationship between ownership of washing machines, by type and equivalised gross household income quintiles. It shows that front loading automatic washing machines were almost three times more prevalent in households in the highest quintile (26%) than in the lowest quintile (9%). The ownership of top loading washing machines was relatively consistent between the income categories, ranging from 71% (highest quintile) to 78% (third quintile).

Washing machines continued

2.3 WASHINE MACHINE TYPE, By equivalised gross household income quintile

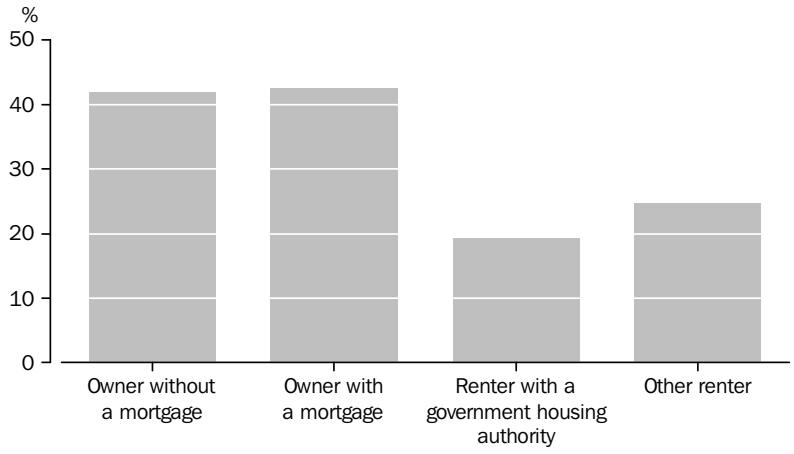


Reduced flow shower heads

Tables 2.14 and 2.15 show the number of households reporting whether they had a reduced flow shower head. In October 2004 a total of 233,600 South Australian households (or 37%) had a reduced flow shower head. A total of 374,300 households (59%) reported not having a reduced flow shower head and 26,000 (4%) reported they were unsure whether the dwelling had one or not.

Graph 2.4 shows that dwelling owners were most likely to have a reduced flow shower head, with 42% of owners without a mortgage and 43% of owners with a mortgage reporting that their dwellings had at least one of these water saving devices. This compares with 19% of renters with a government housing authority and 25% of other renters.

2.4 HOUSEHOLDS WITH REDUCED FLOW SHOWER HEADS, By tenure type

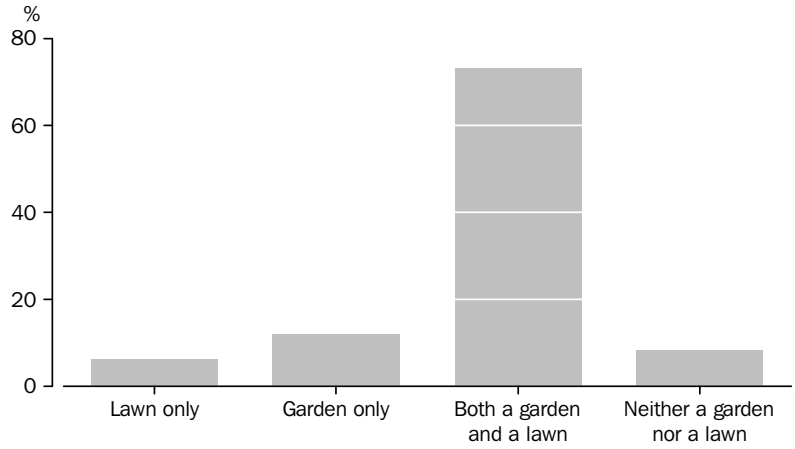


The prevalence of reduced flow shower heads shows less variation by income quintiles than by tenure type, ranging between 34% of households in the lowest quintile, to 40% of households in the third and highest quintiles (table 2.15).

Garden or a lawn

In October 2004, 92% of all South Australian households reported they had a garden, lawn or both. Having both a garden and a lawn was very common (73%) and only 8% of all households reported they did not have a garden or a lawn (graph 2.5 and tables 2.16 and 2.17).

2.5 HOUSEHOLDS WITH A GARDEN AND/OR LAWN



Having a garden or a lawn varied according to tenure type, with 97% of all households that owned their dwelling without a mortgage and 94% of households that owned their dwelling with a mortgage reporting they had a garden and/or a lawn. This compares with 87% for households in rental dwellings with a government housing authority and 82% for households in other rental dwellings.

Watering methods

The South Australian State Government introduced permanent water conservation measures on 26 October 2003 (SA Water 2004). Measures concerning gardens and lawns are that watering by hand or through drip-feed irrigation systems can occur at any time of the day; however, use of sprinklers is restricted to specified times of the day. The restriction on use of sprinklers may have impacted on watering methods used by households.

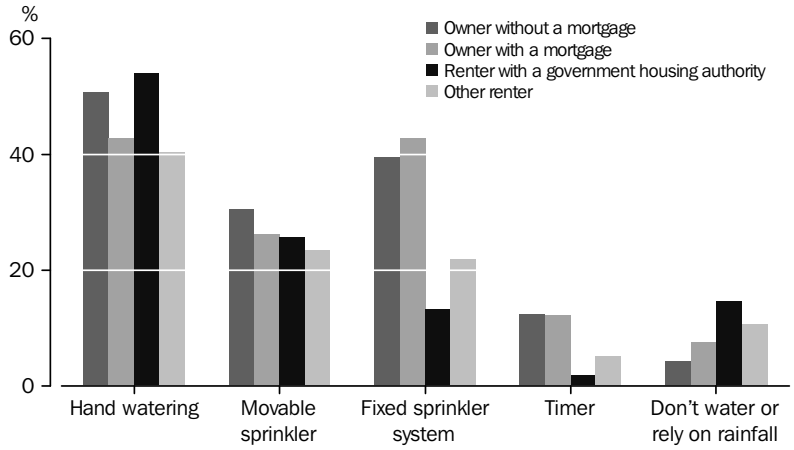
In the 12 months to October 2004, the most common method of watering the garden or lawn by South Australian households was hand watering (46% of households), followed by fixed sprinkler system (35%) and movable sprinkler (27%) (tables 2.18 and 2.19). Only 10% of households reported using a timer when watering. Hand watering was the only method used by 24% of households to water a garden and/or lawn.

Graph 2.6 presents watering methods by tenure type. The most popular methods amongst owners with a mortgage were hand watering (43% of households) and fixed sprinkler systems (43% of households). Hand watering was the most popular method amongst all other tenure types, ranging between 40% of other renters and 54% of renters with a government housing authority (49,700 and 28,000 households respectively).

Dwelling owners were most likely to report that they used a timer when watering (12% for both owners without a mortgage and owners with a mortgage). Renters with a government housing authority had the highest incidence of not watering or relying on rainfall (15% or 7,600 households).

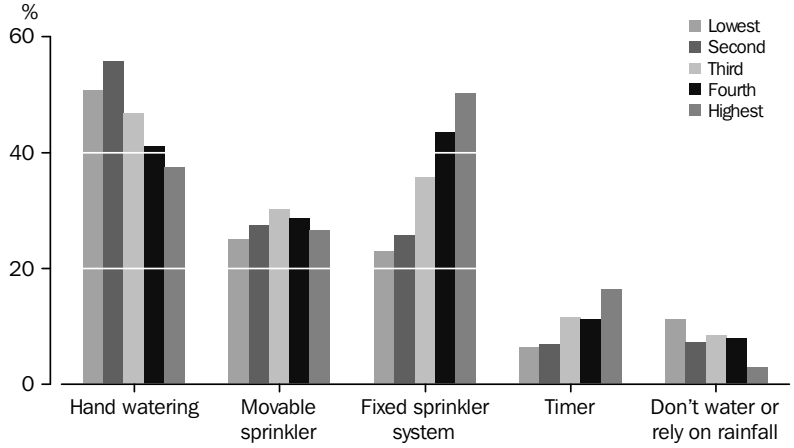
Watering methods continued

2.6 WATERING METHODS, By tenure type



Graph 2.7 shows the watering methods used according to equivalised gross household income quintiles. It shows that more than half of the households in the lowest and second quintile groups watered by hand (51% and 56% respectively). The highest income group had the highest proportion of households that watered with a fixed sprinkler system (50%) and the highest proportion that used timers (16%).

2.7 WATERING METHODS, By equivalised gross household income quintile

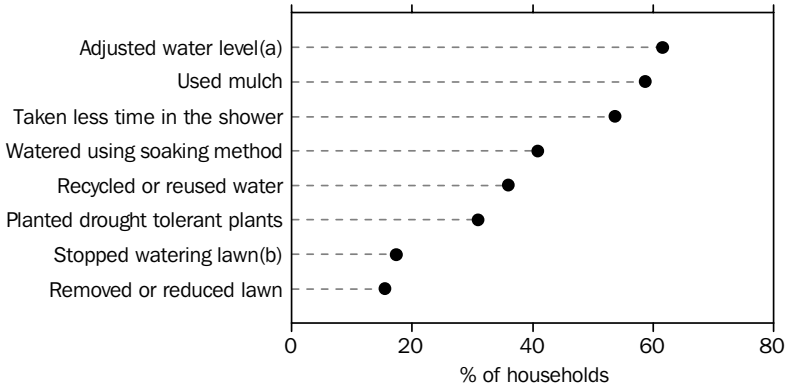


Water conservation actions

Water conservation actions refer to actions that may conserve water, either directly or indirectly. The Domestic Use of Water and Energy Survey, SA asked householders a range of questions relating to their water conservation actions. The data are presented in tables 2.20 to 2.23. While it was not intended to be a comprehensive list of all water conservation actions, it provided a summary of some of the main actions that households can carry out inside and around their dwelling to conserve water.

Graph 2.8 shows that the most common action taken by households was adjusting the water level when washing clothes or dishes (61%), followed closely by using mulch (59%). Taking less time in the shower was also a popular water conservation action with over half (54%) of South Australian households reporting that they took this action in the 12 months to October 2004.

2.8 WATER CONSERVATION ACTIONS TAKEN IN THE LAST 12 MONTHS



(a) When washing clothes or dishes.
(b) Includes households which have not watered the lawn.

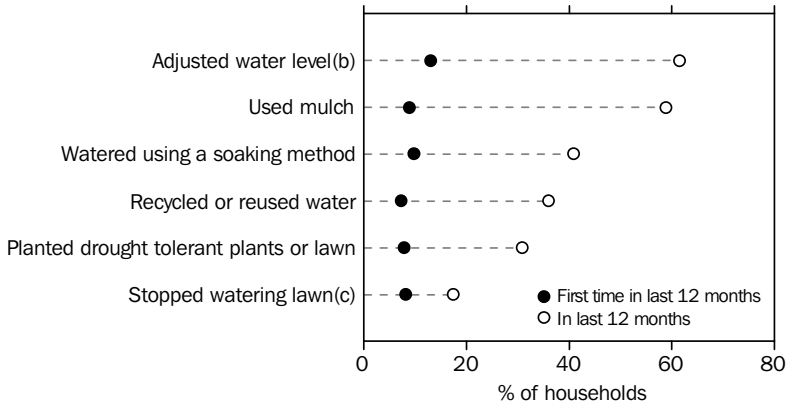
ACTIONS TAKEN FOR THE FIRST TIME

Respondents were asked whether the water conservation actions they took, were taken for the first time in the last 12 months. Graph 2.9 shows most of the water conservation actions taken by households in the 12 months to October 2004, had also been taken prior to this period. For example, most households used mulch in the 12 months to October 2004 (59% of households) but only 9% of households reported that the first time they used mulch was in the last 12 months. Adjusting the water level when washing clothes or dishes was the most common action taken for the first time in the last 12 months (13% of households).

Water conservation actions continued

ACTIONS TAKEN FOR THE FIRST TIME *continued*

2.9 WATER CONSERVATION ACTIONS(a)



(a) Excludes 'Taken less time in the shower' and 'Removed or reduced lawn'.
(b) When washing clothes or dishes.
(c) Includes households which have not watered the lawn.

2.10 HOUSEHOLDS WITH A RAINWATER TANK PLUMBED INTO DWELLING, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
With	73.4	68.7	8.1	24.4	3.9	178.6
Without	138.6	168.6	43.7	98.9	5.6	455.4
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
With	34.6	29.0	15.7	19.8	40.8	28.2
Without	65.4	71.0	84.3	80.2	59.2	71.8
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

2.11 HOUSEHOLDS WITH A RAINWATER TANK PLUMBED INTO DWELLING, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
With	28.3	27.7	28.5	29.2	25.4	39.4	178.6
Without	75.2	77.0	75.4	74.7	80.5	72.7	455.4
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
With	27.3	26.5	27.5	28.1	24.0	35.2	28.2
Without	72.7	73.5	72.5	71.9	76.0	64.8	71.8
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

2.12 WASHING MACHINE TYPE, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
Top loading automatic	154.7	174.5	39.7	89.2	7.5	465.6
Front loading automatic	29.2	46.7	*2.5	16.6	*0.8	95.8
Total households(a)	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Top loading automatic	73.0	73.5	76.6	72.3	78.8	73.4
Front loading automatic	13.8	19.7	*4.8	13.4	*8.7	15.1
Total households(a)	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Includes households with other types of washing machines (e.g. twin tubs, wringers) or with no washing machines.

2.13 WASHING MACHINE TYPE, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
Top loading automatic	74.0	80.6	81.4	75.4	74.8	79.3	465.6
Front loading automatic	9.3	10.2	13.3	19.4	27.6	16.1	95.8
Total households(a)	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Top loading automatic	71.6	76.9	78.4	72.6	70.6	70.8	73.4
Front loading automatic	8.9	9.7	12.8	18.6	26.1	14.4	15.1
Total households(a)	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

(a) Includes households with other types of washing machines (e.g. twin tubs, wringers) or with no washing machines.

2.14 HOUSEHOLDS WITH REDUCED FLOW SHOWER HEADS, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
With	88.7	100.9	10.0	30.3	3.7	233.6
Without	116.8	129.7	39.2	83.5	5.1	374.3
Don't know	6.5	6.7	*2.7	9.5	**0.6	26.0
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
With	41.8	42.5	19.3	24.6	38.9	36.9
Without	55.1	54.7	75.6	67.7	54.2	59.0
Don't know	3.1	2.8	*5.2	7.7	**6.8	4.1
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

2.15 HOUSEHOLDS WITH REDUCED FLOW SHOWER HEADS, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
With	34.7	38.9	41.2	37.5	41.9	39.5	233.6
Without	63.4	61.3	59.3	63.4	60.5	66.4	374.3
Don't know	5.4	4.6	*3.4	*3.0	*3.5	6.2	26.0
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
With	33.5	37.2	39.7	36.1	39.6	35.2	36.9
Without	61.3	58.5	57.1	61.1	57.1	59.3	59.0
Don't know	5.2	4.4	*3.3	*2.8	*3.3	5.5	4.1
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

2.16 HOUSEHOLDS WITH A GARDEN AND/OR LAWN, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
Lawn only	7.2	13.6	6.6	11.5	*1.2	40.1
Garden only	26.2	25.7	9.9	13.9	*1.2	76.9
Both a garden and a lawn	172.0	183.9	28.6	75.1	5.2	464.8
Total households with a garden and/or lawn	*205.4*	*223.2*	*45.1*	*100.6*	*7.6*	*581.9*
Households with neither a garden nor a lawn	6.6	14.1	6.7	22.8	*1.9	52.1
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Lawn only	3.4	5.7	12.7	9.3	*13.1	6.3
Garden only	12.4	10.8	19.1	11.3	*12.5	12.1
Both a garden and a lawn	81.1	77.5	55.3	60.9	54.4	73.3
Total households with a garden and/or lawn	*96.9*	*94.1*	*87.0*	*81.5*	*80.0*	*91.8*
Households with neither a garden nor a lawn	3.1	5.9	13.0	18.5	*20.0	8.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

2.17 HOUSEHOLDS WITH A GARDEN AND/OR LAWN, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
Lawn only	10.0	6.2	6.4	5.5	4.1	7.9	40.1
Garden only	17.8	13.6	10.2	10.0	12.8	12.6	76.9
Both a garden and a lawn	65.7	77.1	79.5	82.2	80.3	80.0	464.8
Total households with a garden and/or lawn	*93.6*	*96.9*	*96.0*	*97.8*	*97.1*	*100.5*	*581.9*
Households with neither a garden nor a lawn	9.9	7.9	7.9	6.1	8.8	11.6	52.1
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Lawn only	9.7	6.0	6.1	5.3	3.9	7.0	6.3
Garden only	17.2	13.0	9.8	9.6	12.0	11.2	12.1
Both a garden and a lawn	63.5	73.6	76.5	79.2	75.8	71.4	73.3
Total households with a garden and/or lawn	*90.4*	*92.5*	*92.4*	*94.2*	*91.7*	*89.7*	*91.8*
Households with neither a garden nor a lawn	9.6	7.5	7.6	5.8	8.3	10.3	8.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

2.18 WATERING METHODS, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Total*(a)
			HOUSEHOLDS *('000)*		
Hand watering	107.6	101.4	28.0	49.7	290.1
Movable sprinkler	64.9	62.2	13.3	28.8	171.7
Fixed sprinkler system(b)	84.1	101.3	6.9	27.0	221.4
Timer	26.3	29.3	*1.0	6.4	63.9
Other	8.0	5.9	*1.4	*2.6	17.9
Don't water/rely on rainfall	9.2	18.1	7.6	13.2	49.2
Total households with a garden and/or lawn(c)	*205.4*	*223.2*	*45.1*	*100.6*	*581.9*
Households with neither a garden nor a lawn	6.6	14.1	6.7	22.8	52.1
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*		
Hand watering	50.7	42.7	54.0	40.3	45.8
Movable sprinkler	30.6	26.2	25.7	23.4	27.1
Fixed sprinkler system(b)	39.6	42.7	13.2	21.9	34.9
Timer	12.4	12.3	*1.9	5.2	10.1
Other	3.8	2.5	*2.7	*2.1	2.8
Don't water/rely on rainfall	4.4	7.6	14.7	10.7	7.8
Total households with a garden and/or lawn(c)	*96.9*	*94.1*	*87.0*	*81.5*	*91.8*
Households with neither a garden nor a lawn	3.1	5.9	13.0	18.5	8.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Includes 'Other' tenure type because most estimates for 'Other' tenure type have relative standard errors greater than 25%.

(b) Includes drip systems.

(c) Totals may not equal the sum of components as more than one response could be specified.

2.19 WATERING METHODS, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
Hand watering	52.6	58.5	48.6	42.8	39.7	47.9	290.1
Movable sprinkler	25.9	28.7	31.4	29.7	28.3	27.7	171.7
Fixed sprinkler system(a)	23.7	26.9	37.2	45.1	53.0	35.4	221.4
Timer	6.6	7.3	12.0	11.6	17.4	9.0	63.9
Other	*2.6	*3.2	*2.4	*2.8	*3.6	*3.3	17.9
Don't water/rely on rainfall	11.6	7.6	8.8	8.3	*3.1	9.8	49.2
Total households with a garden and/or lawn(b)	*93.6*	*96.9*	*96.0*	*97.8*	*97.1*	*100.5*	*581.9*
Households with neither a garden nor a lawn	9.9	7.9	7.9	6.1	8.8	11.6	52.1
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Hand watering	50.8	55.8	46.8	41.2	37.5	42.7	45.8
Movable sprinkler	25.0	27.4	30.2	28.6	26.7	24.7	27.1
Fixed sprinkler system(a)	22.9	25.7	35.8	43.5	50.1	31.6	34.9
Timer	6.4	7.0	11.5	11.1	16.4	8.0	10.1
Other	*2.5	*3.1	*2.4	*2.6	*3.4	*2.9	2.8
Don't water/rely on rainfall	11.2	7.3	8.5	8.0	*2.9	8.8	7.8
Total households with a garden and/or lawn(b)	*90.4*	*92.5*	*92.4*	*94.2*	*91.7*	*89.7*	*91.8*
Households with neither a garden nor a lawn	9.6	7.5	7.6	5.8	8.3	10.3	8.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Includes drip systems.

(b) Totals may not equal the sum of components as more than one response could be specified.

2.20 SELECTED WATER CONSERVATION ACTIONS AROUND THE DWELLING, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Total*(a)
			HOUSEHOLDS *('000)*		
In the last 12 months					
Stopped watering the lawn	30.8	42.6	12.5	22.3	110.4
Watered using a soaking method	90.7	115.3	15.9	35.0	259.4
Planted drought tolerant plants or lawn	72.6	90.9	12.2	18.2	195.7
Used mulch	146.1	156.2	23.2	42.6	372.4
Removed or reduced the size of the lawn	37.7	47.1	6.7	6.1	98.5
Total households taking selected water conservation actions around the dwelling(b)	*178.6*	*200.2*	*35.6*	*70.3*	*491.0*
For the first time in the last 12 months					
Stopped watering the lawn	13.0	21.8	6.2	10.4	52.4
Watered using a soaking method	21.5	26.6	4.8	9.0	62.5
Planted drought tolerant plants	18.3	22.1	*3.3	6.0	50.2
Used mulch	20.4	22.7	4.9	7.5	56.5
Total households taking selected water conservation actions around the dwelling(b)(c)	*53.8*	*67.9*	*13.4*	*25.6*	*162.9*
Total households with a garden and/or lawn	*205.4*	*223.2*	*45.1*	*100.6*	*581.9*
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*		
In the last 12 months					
Stopped watering the lawn	14.5	17.9	24.1	18.1	17.4
Watered using a soaking method	42.8	48.6	30.7	28.4	40.9
Planted drought tolerant plants or lawn	34.2	38.3	23.6	14.8	30.9
Used mulch	68.9	65.8	44.8	34.5	58.7
Removed or reduced the size of the lawn	17.8	19.8	12.9	4.9	15.5
Total households taking selected water conservation actions around the dwelling(b)	*84.3*	*84.4*	*68.7*	*57.0*	*77.4*
For the first time in the last 12 months					
Stopped watering the lawn	6.1	9.2	11.9	8.5	8.3
Watered using a soaking method	10.1	11.2	9.2	7.3	9.9
Planted drought tolerant plants	8.7	9.3	*6.4	4.9	7.9
Used mulch	9.6	9.6	9.4	6.1	8.9
Total households taking selected water conservation actions around the dwelling(b)(c)	*25.4*	*28.6*	*25.9*	*20.7*	*25.7*
Total households with a garden and/or lawn	*96.9*	*94.1*	*87.0*	*81.5*	*91.8*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Includes 'Other' tenure type because most estimates for 'Other' tenure type have relative standard errors greater than 25%.

(b) Totals may not equal the sum of the components as more than one response may be specified.

(c) Data on 'Removed or reduced the size of the lawn' were not collected.

2.21 SELECTED WATER CONSERVATION ACTIONS AROUND THE DWELLING, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
			HOUSEHOLDS *('000)*				
In the last 12 months							
Stopped watering the lawn	20.3	21.9	17.9	19.9	10.6	19.9	110.4
Watered using a soaking method	31.5	39.2	45.8	48.5	53.8	40.7	259.4
Planted drought tolerant plants or lawn	25.9	28.0	36.0	34.7	39.6	31.5	195.7
Used mulch	52.0	61.4	59.6	65.8	70.7	62.9	372.4
Removed or reduced the size of the lawn	12.0	15.9	18.4	15.2	18.4	18.6	98.5
Total households taking selected water conservation actions around the dwelling(a)	*74.0*	*81.8*	*82.8*	*83.2*	*86.4*	*82.6*	*491.0*
For the first time in the last 12 months							
Stopped watering the lawn	9.0	10.9	8.8	9.2	5.4	9.1	52.4
Watered using a soaking method	6.9	10.4	11.6	10.8	15.1	7.7	62.5
Planted drought tolerant plants	7.3	6.8	10.1	9.0	10.0	7.0	50.2
Used mulch	9.4	10.9	9.5	8.4	11.4	6.8	56.5
Total households taking selected water conservation actions around the dwelling(a)(b)	*23.2*	*28.8*	*29.9*	*27.7*	*31.2*	*22.2*	*162.9*
Total households with a garden and/or lawn	*93.6*	*96.9*	*96.0*	*97.8*	*97.1*	*100.5*	*581.9*
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*				
In the last 12 months							
Stopped watering the lawn	19.6	20.9	17.2	19.2	10.0	17.7	17.4
Watered using a soaking method	30.4	37.4	44.1	46.7	50.8	36.3	40.9
Planted drought tolerant plants or lawn	25.0	26.7	34.6	33.4	37.4	28.1	30.9
Used mulch	50.2	58.6	57.4	63.3	66.8	56.1	58.7
Removed or reduced the size of the lawn	11.6	15.2	17.7	14.6	17.4	16.6	15.5
Total households taking selected water conservation actions around the dwelling(a)	*71.5*	*78.1*	*79.7*	*80.2*	*81.6*	*73.7*	*77.4*
For the first time in the last 12 months							
Stopped watering the lawn	8.7	10.4	8.5	8.8	5.1	8.1	8.3
Watered using a soaking method	6.7	9.9	11.2	10.4	14.2	6.8	9.9
Planted drought tolerant plants	7.1	6.5	9.7	8.6	9.4	6.3	7.9
Used mulch	9.1	10.4	9.1	8.1	10.8	6.1	8.9
Total households taking selected water conservation actions around the dwelling(a)(b)	*22.4*	*27.5*	*28.7*	*26.7*	*29.4*	*19.8*	*25.7*
Total households with a garden and/or lawn	*90.4*	*92.5*	*92.4*	*94.2*	*91.7*	*89.7*	*91.8*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

(a) Totals may not equal the sum of the components as more than one response may be specified.

(b) Data on 'Removed or reduced the size of the lawn' were not collected.

2.22 HOUSEHOLDS TAKING OTHER SELECTED WATER CONSERVATION ACTIONS, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
In the last 12 months						
Recycled or reused water	84.6	90.9	17.3	32.1	*3.3	228.2
Adjusted the water level when washing clothes or dishes	128.8	148.3	32.0	74.7	5.8	389.6
Taken less time in the shower	115.0	127.6	28.8	63.9	5.3	340.6
Total households taking other water conservation actions(a)	*173.4*	*194.7*	*42.4*	*95.6*	*7.9*	*514.0*
For the first time in the last 12 months						
Recycled or reused water	14.9	19.6	3.8	7.2	**0.6	46.1
Adjusted the water level when washing clothes or dishes	26.8	29.2	7.4	17.4	*1.6	82.4
Total households taking other water conservation actions(a)(b)	*35.8*	*42.0*	*9.5*	*22.0*	*1.8	*111.0*
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
In the last 12 months						
Recycled or reused water	39.9	38.3	33.4	26.0	*35.0	36.0
Adjusted the water level when washing clothes or dishes	60.8	62.5	61.8	60.6	61.5	61.5
Taken less time in the shower	54.3	53.7	55.5	51.8	56.2	53.7
Total households taking other water conservation actions(a)	*81.8*	*82.0*	*81.8*	*77.5*	*83.4*	*81.1*
For the first time in the last 12 months						
Recycled or reused water	7.0	8.3	7.3	5.8	**6.2	7.3
Adjusted the water level when washing clothes or dishes	12.6	12.3	14.3	14.1	*17.0	13.0
Total households taking other water conservation actions(a)(b)	*16.9*	*17.7*	*18.3*	*17.8*	*19.1	*17.5*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Totals may not equal the sum of the components as more than one response may be specified.

(b) Data on 'Taken less time in the shower' were not collected.

2.23 HOUSEHOLDS TAKING OTHER SELECTED WATER CONSERVATION ACTIONS, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
			HOUSEHOLDS *('000)*				
In the last 12 months							
Recycled or reused water	36.7	40.1	34.8	36.9	33.5	46.2	228.2
Adjusted the water level when washing clothes or dishes	60.2	68.1	64.9	62.5	63.6	70.3	389.6
Taken less time in the shower	57.8	59.7	58.6	54.3	52.2	58.1	340.6
Total households taking other water conservation actions(a)	*83.9*	*87.5*	*84.4*	*83.1*	*83.6*	*91.5*	*514.0*
For the first time in the last 12 months							
Recycled or reused water	7.9	7.7	7.4	6.8	9.1	7.2	46.1
Adjusted the water level when washing clothes or dishes	11.6	15.6	14.9	14.1	12.7	13.5	82.4
Total households taking other water conservation actions for the first time(a)(b)	*17.0*	*20.0*	*19.5*	*18.2*	*18.8*	*17.5*	*111.0*
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*				
In the last 12 months							
Recycled or reused water	35.5	38.3	33.5	35.6	31.6	41.2	36.0
Adjusted the water level when washing clothes or dishes	58.2	65.0	62.5	60.2	60.1	62.7	61.5
Taken less time in the shower	55.8	57.0	56.4	52.3	49.3	51.8	53.7
Total households taking other water conservation actions(a)	*81.1*	*83.5*	*81.2*	*80.1*	*78.9*	*81.6*	*81.1*
For the first time in the last 12 months							
Recycled or reused water	7.6	7.4	7.1	6.6	8.6	6.4	7.3
Adjusted the water level when washing clothes or dishes	11.2	14.9	14.4	13.5	12.0	12.0	13.0
Total households taking other water conservation actions for the first time(a)(b)	*16.5*	*19.1*	*18.8*	*17.5*	*17.8*	*15.6*	*17.5*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

(a) Totals may not equal the sum of the components as more than one response may be specified.

(b) Data on 'Taken less time in the shower' were not collected.

CHAPTER 3 ENERGY USE AND CONSERVATION

INTRODUCTION

It has been estimated that in 2001–02 energy consumption in South Australia was approximately 330 petajoules, representing 7% of energy consumption in Australia. Of total energy use in Australia, household use accounted for 8%. In South Australia, household use accounted for 9% of the state's total energy consumption (ABARE 2004).

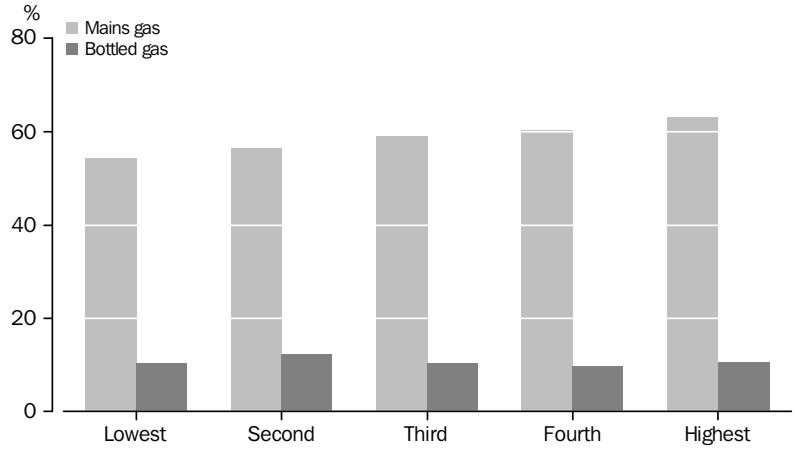
SURVEY RESULTS

Gas connection

In October 2004, 429,700 households in South Australia, or 68% of households, had either mains or bottled gas connected to their dwelling. Overall, 57% of households in South Australia were connected to mains gas and 11% to bottled gas (tables 3.11 and 3.12).

Graph 3.1 shows that the proportions of households in equivalised gross household income quintiles connected to mains gas ranged from 54% in the lowest quintile to 63% in the highest quintile.

3.1 GAS CONNECTION, By equivalised gross household income quintile



Hot water systems

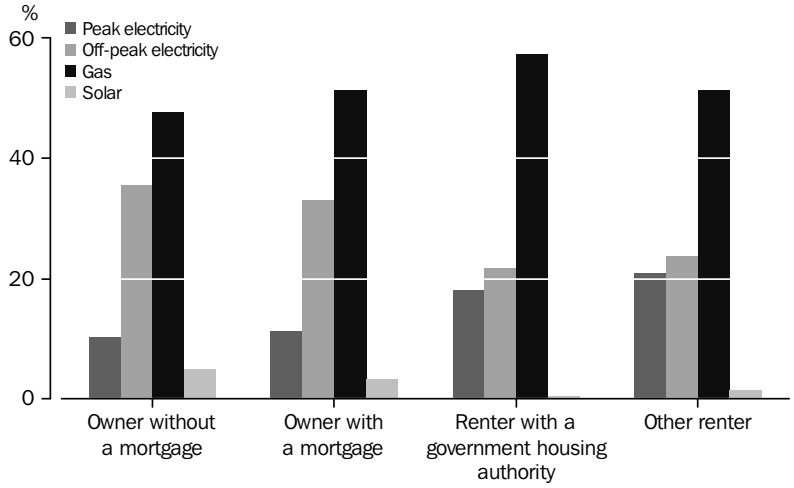
Water heating is responsible for over one-third of the state's residential greenhouse gas emissions (Energy SA, 2004). Tables 3.13 and 3.14 show the main energy sources for hot water systems used by South Australian households.

In October 2004, 50% of all South Australian households used gas hot water systems, 45% used electric hot water systems and 3% used solar hot water systems. Of the 285,300 households using an electric hot water system, 87,300 used peak electricity (14% of all households) and 198,000 used off-peak electricity (31% of all households).

Hot water systems continued

While similar proportions of dwelling owners and renters used electric hot water systems, graph 3.2 shows that 36% of dwelling owners without a mortgage and 33% of dwelling owners with a mortgage used off-peak electricity compared with 22% of dwelling renters with a government housing authority and 24% of other dwelling renters.

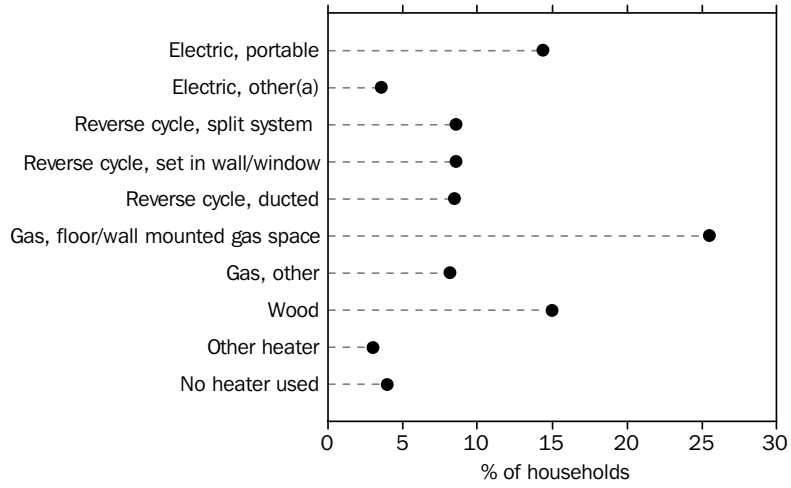
3.2 MAIN ENERGY SOURCE FOR HOT WATER SYSTEM, By tenure type



Main type of heater

Tables 3.15 and 3.16 show the type of heater used most often by South Australian households. Gas heaters, the most commonly used form of heating, were used by 34% of households (26% floor/wall mounted space heater and 8% other). Other heaters commonly used were reverse cycle air conditioners, used by 26% of households (split system 9%, set in wall/window 9% and ducted 9%). Electric heater usage was also common, used by 18% of households (portable 14% and other 4%) (graph 3.3).

3.3 MAIN TYPE OF HEATER

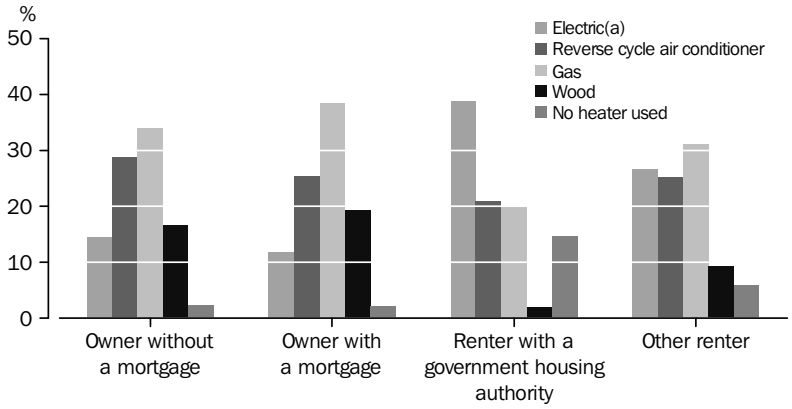


(a) Excludes reverse cycle air conditioners.

Main type of heater continued

Graph 3.4 shows the relationship between heater used most often and tenure type. Dwelling renters were more likely to use an electric heater (39% of renters with a government housing authority and 27% of other renters) than dwelling owners (15% of owners without a mortgage and 12% of owners with a mortgage).

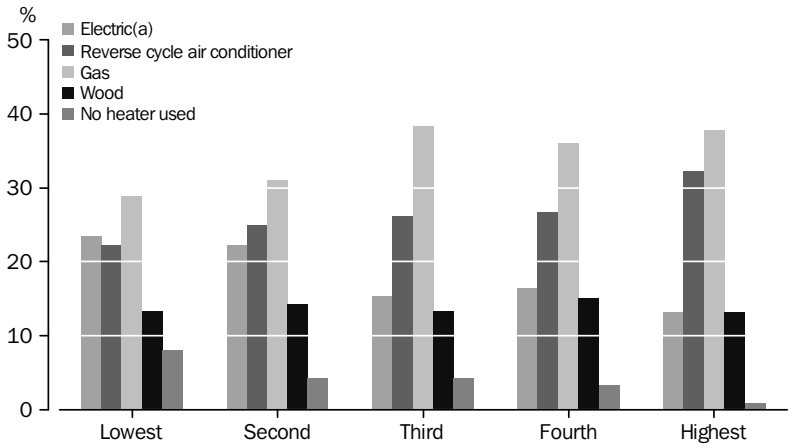
3.4 MAIN TYPE OF HEATER, By tenure type



(a) Excludes reverse cycle air conditioners.

As shown in graph 3.5, households in lower income quintiles were more likely to use an electric heater. Electric heaters were used most often by 24% of households in the lowest quintile, compared with 13% of households in the highest quintile. Heating using a reverse cycle air conditioner or gas heater was more common in the higher quintiles. In the highest quintile 32% of households used a reverse cycle air conditioner and 38% of households used a gas heater. In contrast, in the lowest quintile 22% of households used a reverse cycle air conditioner and 29% used a gas heater.

3.5 MAIN TYPE OF HEATER, By equivalised gross household income quintile



(a) Excludes reverse cycle air conditioners.

Only 4% of households did not use a heater. No heater was used in 15% of households renting from a government housing authority and 8% of households in the lowest income quintile.

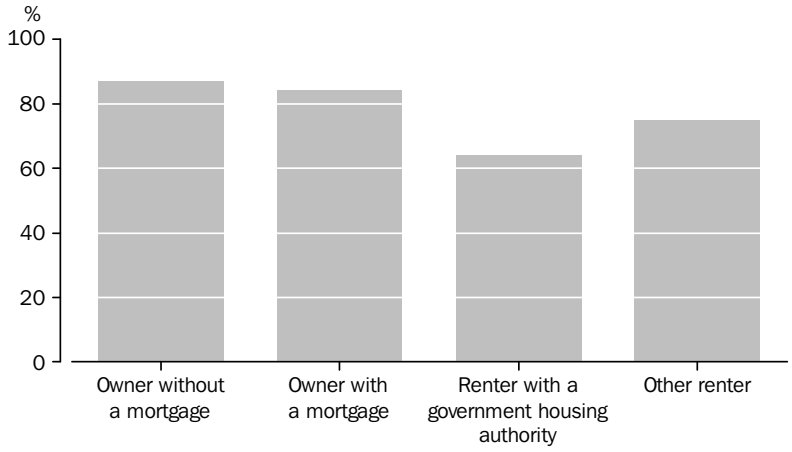
Air conditioners

In South Australia air conditioners considerably influence the electricity demand, particularly during summer heat-waves (Energy SA 2003).

Air conditioners were used by 518,500 households in South Australia (82% of households) (tables 3.17 and 3.18). Evaporative air conditioners were reported as being used most often by 158,600 of these households, representing 25% of households, or 31% of households using an air conditioner (tables 3.19 and 3.20).

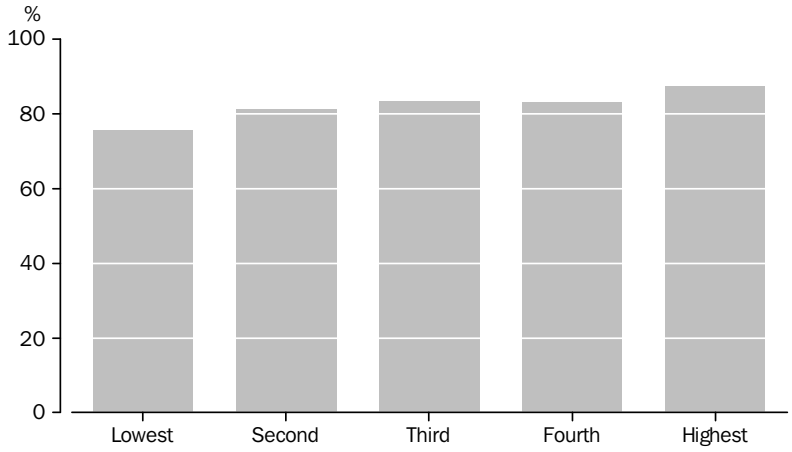
Air conditioner usage by tenure type and income is presented in graphs 3.6 and 3.7. Air conditioners were used by 87% of owners without a mortgage and 84% of owners with a mortgage compared with 64% of renters with a government housing authority and 75% of other renters (graph 3.6).

3.6 HOUSEHOLDS USING AN AIR CONDITIONER, By tenure type



Graph 3.7 shows that households in the higher income quintiles were more likely to use an air conditioner. The percentage of households using an air conditioner was 87% in the highest quintile compared with 76% in the lowest quintile.

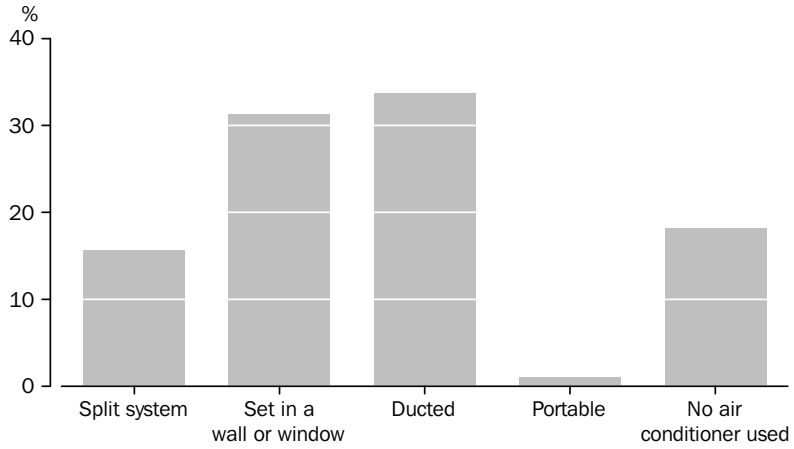
3.7 HOUSEHOLDS USING AN AIR CONDITIONER, By equivalised gross household income quintile



Air conditioners continued

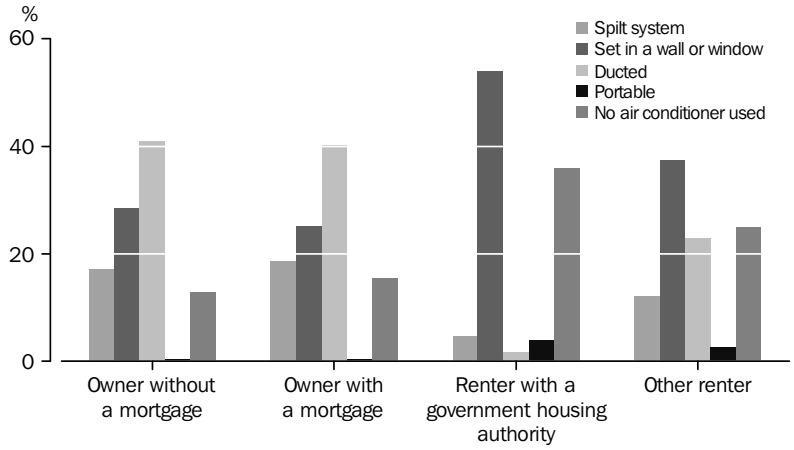
Ducted air conditioning was reported as being used most often in 41% of households using an air conditioner (or 34% of all South Australian households). An air conditioner set in a wall or window was reported as being used most often in 38% of households using an air conditioner (or 31% of all households) (graph 3.8 and tables 3.21 and 3.22).

3.8 LOCATION OF AIR CONDITIONER



In owned dwellings air conditioners were most commonly ducted, reported in 41% of dwellings owned without a mortgage and 40% with a mortgage. In contrast, air conditioning set in a wall or window was most common in rented dwellings, with 54% of renters with a government housing authority and 38% of other renters reporting an air conditioner set in these locations (graph 3.9).

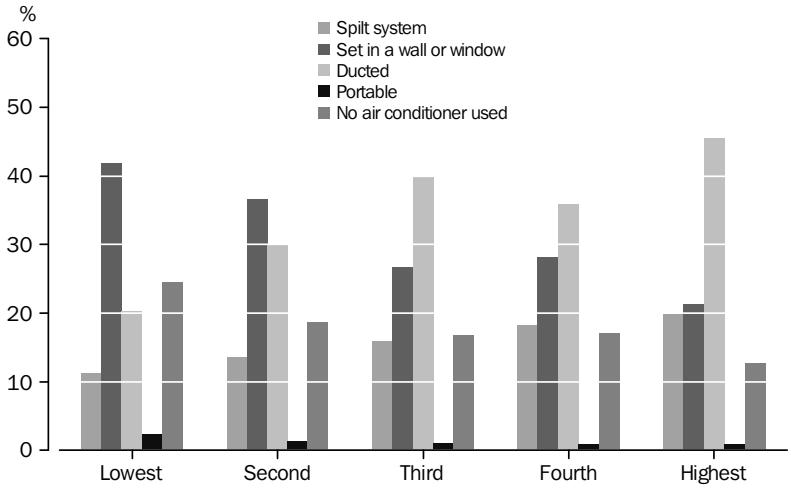
3.9 LOCATION OF AIR CONDITIONER, By tenure type



Air conditioners
continued

Graph 3.10 shows use of ducted air conditioning was most common in households in the higher income quintiles. Of all the households in the highest quintile, 46% had ducted air conditioning compared with 20% of households in the lowest quintile. Air conditioners set in a wall or window were used most commonly in households in the lower quintiles with 42% of households in the lowest quintile reporting an air conditioner set in these locations. This compares with 21% of households in the highest quintile.

3.10 LOCATION OF AIR CONDITIONER, By equivalised gross household income quintile



3.11 HOUSEHOLDS CONNECTED TO GAS, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
Connected to mains gas	118.8	136.2	32.2	72.1	*2.7	362.1
Connected to bottled gas	25.8	32.8	*2.4	9.7	*1.3	72.0
Total households connected to gas(a)	*143.9*	*167.1*	*34.0*	*81.0*	*3.7*	*429.7*
Not connected to gas	68.1	70.3	17.9	42.3	5.7	204.3
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Connected to mains gas	56.0	57.4	62.2	58.5	*28.6	57.1
Connected to bottled gas	12.2	13.8	*4.7	7.9	*13.3	11.4
Total households connected to gas(a)	*67.9*	*70.4*	*65.6*	*65.7*	*39.5*	*67.8*
Not connected to gas	32.1	29.6	34.4	34.3	60.5	32.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Totals may not equal the sum of the components as more than one source of gas may be specified.

3.12 HOUSEHOLDS CONNECTED TO GAS, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
Connected to mains gas	56.2	59.1	61.3	62.7	66.7	56.1	362.1
Connected to bottled gas	10.6	12.9	10.6	10.2	11.3	16.4	72.0
Total households connected to gas(a)	*66.2*	*71.1*	*71.7*	*72.7*	*76.8*	*71.1*	*429.7*
Not connected to gas	37.3	33.6	32.2	31.1	29.1	41.0	204.3
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Connected to mains gas	54.3	56.4	59.0	60.4	63.0	50.1	57.1
Connected to bottled gas	10.2	12.3	10.2	9.9	10.7	14.7	11.4
Total households connected to gas(a)	*63.9*	*67.9*	*69.0*	*70.0*	*72.6*	*63.4*	*67.8*
Not connected to gas	36.1	32.1	31.0	30.0	27.4	36.6	32.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

(a) Totals may not equal sum of the components as more than one source of gas may be specified.

3.13 MAIN ENERGY SOURCE OF HOT WATER SYSTEM, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
Peak electricity	22.0	26.7	9.4	25.8	*3.3	87.3
Off-peak electricity	75.4	78.7	11.3	29.4	*3.2	198.0
Total electricity	*97.4*	*105.4*	*20.7*	*55.2*	*6.5*	*285.3*
Gas	101.3	122.1	29.7	63.4	*2.5	319.0
Solar	10.7	7.9	**0.2	*2.0	—	20.8
Other(a)	*2.4	*2.0	*1.2	*2.7	**0.5	8.7
Total households with a hot water system	*211.8*	*237.3*	*51.8*	*123.3*	*9.5*	*633.8*
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Peak electricity	10.4	11.3	18.1	21.0	*34.6	13.8
Off-peak electricity	35.6	33.1	21.8	23.8	*33.8	31.2
Total electricity	*46.0*	*44.4*	*39.9*	*44.8*	*68.4*	*45.0*
Gas	47.8	51.4	57.3	51.4	*26.7	50.3
Solar	5.0	3.3	**0.4	*1.6	—	3.3
Other(a)	*1.1	*0.8	*2.3	*2.2	**4.9	1.4
Total households with a hot water system	*99.9*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) Includes wood and unknown type of hot water system.

3.14 MAIN ENERGY SOURCE OF HOT WATER SYSTEM, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
	HOUSEHOLDS *('000)*						
Peak electricity	18.3	14.9	11.4	12.2	14.0	16.5	87.3
Off-peak electricity	31.6	31.5	32.9	32.2	29.2	40.7	198.0
Total electricity	*49.8*	*46.4*	*44.3*	*44.4*	*43.1*	*57.2*	*285.3*
Gas	49.8	53.9	55.9	54.9	57.5	47.1	319.0
Solar	*2.3	*3.1	*2.7	*3.3	4.1	5.3	20.8
Other(a)	*1.4	*1.4	*1.0	*1.3	*1.2	*2.5	8.7
Total households with a hot water system	*103.3*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*633.8*
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
	PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*						
Peak electricity	17.6	14.2	11.0	11.8	13.2	14.7	13.8
Off-peak electricity	30.5	30.1	31.7	31.0	27.6	36.3	31.2
Total electricity	*48.1*	*44.3*	*42.7*	*42.7*	*40.7*	*51.0*	*45.0*
Gas	48.1	51.4	53.8	52.9	54.3	42.0	50.3
Solar	*2.3	*3.0	*2.6	*3.1	3.9	4.7	3.3
Other(a)	*1.3	*1.3	*0.9	*1.2	*1.1	*2.3	1.4
Total households with a hot water system	*99.8*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Includes wood and unknown type of hot water system.

3.15 MAIN TYPE OF HEATER, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Total*(a)
			HOUSEHOLDS *('000)*		
Electric(b)					
Portable heater	23.7	20.3	18.1	27.3	91.3
Other heater(c)	7.0	7.8	*2.0	5.7	22.7
Total	*30.7*	*28.1*	*20.1*	*33.0*	*114.0*
Reverse cycle air conditioner					
Split system	18.8	22.9	*2.0	9.5	54.3
Set in wall/window	15.8	14.1	8.3	15.2	54.5
Ducted	24.6	22.2	**0.5	5.8	54.0
Total(d)	*61.0*	*60.2*	*10.8*	*31.1*	*166.1*
Gas					
Floor/wall mounted space heater	53.5	66.0	8.3	32.5	161.9
Other	18.7	25.2	*2.0	6.0	52.1
Total	*72.2*	*91.2*	*10.3*	*38.5*	*214.0*
Wood	35.0	46.0	*1.1	11.6	95.3
Other(e)	8.3	6.8	*2.1	*1.7	19.3
Total households using a heater	*207.2*	*232.4*	*44.3*	*115.9*	*608.8*
Households not using a heater	4.8	4.9	7.5	7.5	25.1
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*		
Electric(b)					
Portable heater	11.2	8.6	34.9	22.1	14.4
Other heater(c)	3.3	3.3	*3.9	4.6	3.6
Total	*14.5*	*11.8*	*38.8*	*26.7*	*18.0*
Reverse cycle air conditioner					
Split system	8.9	9.7	*3.9	7.7	8.6
Set in wall/window	7.5	5.9	16.0	12.3	8.6
Ducted	11.6	9.4	**0.9	4.7	8.5
Total(d)	*28.8*	*25.4*	*20.8*	*25.2*	*26.2*
Gas					
Floor/wall mounted space heater	25.2	27.8	15.9	26.4	25.5
Other	8.8	10.6	*3.9	4.8	8.2
Total	*34.0*	*38.4*	*19.9*	*31.2*	*33.8*
Wood	16.5	19.4	*2.0	9.4	15.0
Other(e)	3.9	2.9	*4.0	*1.4	3.0
Total households using a heater	*97.7*	*97.9*	*85.4*	*94.0*	*96.0*
Households not using a heater	2.3	2.1	14.6	6.0	4.0
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Includes 'Other' tenure type because most estimates for 'Other' tenure type have relative standard errors greater than 25%.

(b) Excludes reverse cycle air conditioner.

(c) Includes ceiling, wall or floor radiant heating and off-peak in slab heater or heat bank.

(d) Includes location not known.

(e) Includes oil fired heater.

3.16 MAIN TYPE OF HEATER, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
				HOUSEHOLDS *('000)*			
Electric(a)							
Portable heater	21.4	19.7	11.5	13.0	9.6	16.1	91.3
Other heater(b)	*3.0	3.7	4.4	4.0	4.4	*3.3	22.7
Total	*24.4*	*23.4*	*15.9*	*17.0*	*14.0*	*19.4*	*114.0*
Reverse cycle air conditioner							
Split system	6.4	8.3	8.9	9.6	12.8	8.3	54.3
Set in wall/window	11.6	11.7	7.8	7.0	6.8	9.6	54.5
Ducted	4.7	5.9	10.1	10.3	13.6	9.4	54.0
Total(c)	*23.0*	*26.1*	*27.2*	*27.7*	*34.2*	*27.8*	*166.1*
Gas							
Floor/wall mounted space heater	22.6	25.9	31.8	27.1	30.9	23.6	161.9
Other	7.3	6.6	8.1	10.3	9.2	10.6	52.1
Total	*29.9*	*32.5*	*39.9*	*37.4*	*40.2*	*34.2*	*214.0*
Wood	13.9	14.9	13.9	15.5	14.0	23.2	95.3
Other(d)	4.1	*3.4	*2.6	*2.8	*2.6	3.8	19.3
Total households using a heater	*95.3*	*100.2*	*99.4*	*100.5*	*104.9*	*108.5*	*608.8*
Households not using a heater	8.2	4.5	4.5	*3.3	*1.0	3.7	25.1
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
				PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Electric(a)							
Portable heater	20.6	18.8	11.1	12.5	9.1	14.4	14.4
Other heater(b)	*2.9	3.5	4.2	3.9	4.1	*2.9	3.6
Total	*23.5*	*22.3*	*15.3*	*16.4*	*13.2*	*17.3*	*18.0*
Reverse cycle air conditioner							
Split system	6.2	8.0	8.5	9.2	12.1	7.4	8.6
Set in wall/window	11.2	11.1	7.5	6.8	6.4	8.5	8.6
Ducted	4.5	5.7	9.7	9.9	12.9	8.4	8.5
Total(c)	*22.3*	*24.9*	*26.2*	*26.7*	*32.3*	*24.8*	*26.2*
Gas							
Floor/wall mounted space heater	21.9	24.7	30.6	26.1	29.2	21.1	25.5
Other	7.0	6.3	7.8	10.0	8.7	9.4	8.2
Total	*28.9*	*31.0*	*38.4*	*36.1*	*37.9*	*30.5*	*33.8*
Wood	13.4	14.3	13.4	15.0	13.2	20.7	15.0
Other(d)	3.9	*3.2	*2.6	*2.7	*2.5	3.4	3.0
Total households using a heater	*92.0*	*95.7*	*95.7*	*96.8*	*99.1*	*96.7*	*96.0*
Households not using a heater	8.0	4.3	4.3	*3.2	*0.9	3.3	4.0
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Excludes reverse cycle air conditioner.

(b) Includes ceiling, wall or floor radiant heating and off-peak in slab heater or heat bank.

(c) Includes location not known.

(d) Includes oil fired heater.

3.17 NUMBER OF AIR CONDITIONERS USED(a), By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
One	149.0	170.2	30.3	82.6	7.0	439.0
Two	29.0	26.2	*2.5	9.2	**0.6	67.6
Three or more	6.7	4.0	**0.4	*0.8	—	11.9
Total households using an air conditioner	*184.6*	*200.3*	*33.2*	*92.7*	*7.6*	*518.5*
Households not using an air conditioner	27.4	37.0	18.6	30.7	*1.9	115.5
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
One	70.3	71.7	58.5	67.0	73.4	69.2
Two	13.7	11.0	*4.8	7.5	**6.7	10.7
Three or more	3.2	1.7	**0.8	*0.7	—	1.9
Total households using an air conditioner	*87.1*	*84.4*	*64.1*	*75.1*	*80.1*	*81.8*
Households not using an air conditioner	12.9	15.6	35.9	24.9	*19.9	18.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

(a) An air conditioner with more than one outlet is counted as one air conditioner.

3.18 NUMBER OF AIR CONDITIONERS USED(a), By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
			HOUSEHOLDS *('000)*				
One	67.8	72.5	73.0	72.8	78.8	74.2	439.0
Two	8.7	10.0	10.9	12.1	11.7	14.1	67.6
Three or more	*1.7	*2.6	*2.7	*1.2	*2.1	*1.6	11.9
Total households using an air conditioner	*78.2*	*85.1*	*86.6*	*86.2*	*92.6*	*89.8*	*518.5*
Households not using an air conditioner	25.3	19.6	17.3	17.7	13.3	22.3	115.5
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*				
One	65.5	69.2	70.3	70.1	74.4	66.1	69.2
Two	8.4	9.5	10.5	11.7	11.1	12.6	10.7
Three or more	*1.6	*2.5	*2.6	*1.2	*2.0	*1.4	1.9
Total households using an air conditioner	*75.5*	*81.3*	*83.3*	*83.0*	*87.4*	*80.1*	*81.8*
Households not using an air conditioner	24.5	18.7	16.7	17.0	12.6	19.9	18.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) An air conditioner with more than one outlet is counted as one air conditioner.

3.19 LOCATION OF EVAPORATIVE AIR CONDITIONER USED MOST OFTEN, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Total*(a)
			HOUSEHOLDS *('000)*		
Evaporative set in a wall/window	5.0	5.0	*1.9	4.2	16.2
Evaporative ducted	52.8	65.3	**0.4	17.1	136.2
Total households with an evaporative air conditioner(b)	*58.6*	*70.8*	*4.2*	*24.1*	*158.6*
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*		
Evaporative set in a wall/window	2.4	2.1	*3.6	3.4	2.6
Evaporative ducted	24.9	27.5	**0.8	13.9	21.5
Total households with an evaporative air conditioner(b)	*27.6*	*29.8*	*8.2*	*19.6*	*25.0*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

(a) Includes 'Other' tenure type because most estimates for 'Other' tenure type have relative standard errors greater than 25%.

(b) Includes evaporative portable air conditioners.

3.20 LOCATION OF EVAPORATIVE AIR CONDITIONER USED MOST OFTEN, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
			HOUSEHOLDS *('000)*				
Evaporative set in a wall/window	*3.1	*2.8	*2.1	*2.6	*1.8	3.8	16.2
Evaporated ducted	14.0	21.6	26.5	24.5	28.7	20.9	136.2
Total households with an evaporative air conditioner(a)	*19.3*	*25.9*	*29.5*	*27.9*	*30.9*	*25.1*	*158.6*
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*				
Evaporative set in a wall/window	*3.0	*2.7	*2.0	*2.5	*1.7	3.3	2.6
Evaporated ducted	13.5	20.7	25.5	23.6	27.1	18.7	21.5
Total households with an evaporative air conditioner(a)	*18.7*	*24.7*	*28.4*	*26.9*	*29.2*	*22.4*	*25.0*
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

(a) Includes evaporative portable air conditioners.

3.21 LOCATION OF AIR CONDITIONER USED MOST OFTEN, By tenure type

	Owner without a mortgage	*Owner with a mortgage*	*Renter with a government housing authority*	*Other renter*	*Other*	*Total*
			HOUSEHOLDS *('000)*			
Spilt system	36.5	44.3	*2.4	15.1	*1.4	99.7
Set in a wall or window	60.4	59.4	27.9	46.2	4.3	198.3
Ducted	86.9	95.7	*0.8	28.2	*1.9	213.6
Portable	*0.8	*1.0	*2.0	*3.2	—	7.0
Total households using an air conditioner	*184.6*	*200.3*	*33.2*	*92.7*	*7.6*	*518.5*
Households not using an air conditioner	27.4	37.0	18.6	30.7	*1.9	115.5
Total households	*212.0*	*237.3*	*51.8*	*123.3*	*9.5*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*			
Spilt system	17.2	18.6	*4.7	12.2	*14.7	15.7
Set in a wall or window	28.5	25.0	53.9	37.5	45.3	31.3
Ducted	41.0	40.3	*1.6	22.8	*20.1	33.7
Portable	*0.4	*0.4	*3.9	*2.6	—	1.1
Total households using an air conditioner	*87.1*	*84.4*	*64.1*	*75.1*	*80.1*	*81.8*
Households not using an air conditioner	12.9	15.6	35.9	24.9	*19.9	18.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

— nil or rounded to zero (including null cells)

3.22 LOCATION OF AIR CONDITIONER USED MOST OFTEN, By equivalised gross household income quintile

	Lowest quintile	*Second quintile*	*Third quintile*	*Fourth quintile*	*Highest quintile*	*Not known or not stated*	*Total*
			HOUSEHOLDS *('000)*				
Spilt system	11.6	14.2	16.4	18.8	20.9	17.7	99.7
Set in a wall or window	43.2	38.3	27.8	29.2	22.6	37.1	198.3
Ducted	20.9	31.2	41.3	37.3	48.2	34.6	213.6
Portable	*2.5	*1.4	*1.0	*0.8	*0.9	**0.4	7.0
Total households using an air conditioner	*78.2*	*85.1*	*86.6*	*86.2*	*92.6*	*89.8*	*518.5*
Households not using an air conditioner	25.3	19.6	17.3	17.7	13.3	22.3	115.5
Total households	*103.5*	*104.8*	*103.9*	*103.8*	*105.9*	*112.1*	*634.0*
			PERCENTAGE OF TOTAL HOUSEHOLDS *(%)*				
Spilt system	11.2	13.6	15.8	18.1	19.8	15.8	15.7
Set in a wall or window	41.8	36.6	26.7	28.1	21.3	33.1	31.3
Ducted	20.2	29.8	39.8	35.9	45.5	30.8	33.7
Portable	*2.4	*1.3	*1.0	*0.8	*0.8	**0.4	1.1
Total households using an air conditioner	*75.5*	*81.3*	*83.3*	*83.0*	*87.4*	*80.1*	*81.8*
Households not using an air conditioner	24.5	18.7	16.7	17.0	12.6	19.9	18.2
Total households	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

EXPLANATORY NOTES

INTRODUCTION

1 This publication contains results from the Domestic Use of Water and Energy Survey, SA, which was conducted throughout SA during the two weeks commencing Monday, 11 October 2004.

2 The survey was conducted as a supplement to the ABS Monthly Population Survey (MPS). The MPS is based on a multistage area sample of private dwellings and a list sample of special dwellings (hotels, motels, hospitals, prisons, short-stay caravan parks, etc.). Information is obtained from the occupants of the selected dwellings by specially trained interviewers. For details of the design, scope and coverage of the MPS, users should refer to any recent edition of the ABS publication, *Labour Force, Australia* (cat. no. 6202.0) or the November 2002 edition of *Information Paper: Labour Force Survey Sample Design* (cat. no. 6269.0).

SCOPE

3 The Domestic Use of Water and Energy Survey, SA was conducted on a subset of the full sample of private dwellings in SA that were included in the MPS. The survey covered all persons who were usual residents of private dwellings except:

- members of the Australian permanent defence forces
- certain diplomatic personnel of overseas governments, customarily excluded from censuses and surveys
- overseas residents in Australia
- members of non-Australian defence forces (and their dependents) stationed in Australia
- persons living in sparsely settled areas of SA.

4 Information was collected by either face to face or telephone interview from one responsible adult per household, who answered questions on behalf of the household. Information was sought from approximately 3,400 households and data were obtained from approximately 91% of these households.

COVERAGE

5 Coverage rules were applied to ensure that each person was associated with only one dwelling and hence had only one chance of selection in the survey.

INTERPRETATION OF RESULTS

6 The factors discussed below should be considered when interpreting the estimates contained in this publication.

7 Respondents were asked if the washing machine in their dwelling was a top loading automatic. Those who answered "no" were then asked if it was a front loading automatic. If respondents volunteered they did not have a washing machine this was recorded. However, other respondents who reported not having a top loading automatic nor a front loading automatic may not have had a washing machine or may have had another type of washing machine such as a twin tub or wringer.

8 The number of air conditioners used may be underestimated because the wording of the questions about the number of air conditioners used in a household varied slightly and depended on the type of heating used most often. Respondents who stated that the type of heating used most often was a reverse cycle air conditioner were asked, "Including the reverse cycle air conditioner used for heating, how many air conditioners does the household use?". Otherwise respondents were asked "How many air conditioners does the household use?". Some respondents, whose main type of heating was not a reverse cycle air conditioner, may have used a reverse cycle air conditioner as a

INTERPRETATION OF RESULTS *continued*

supplementary heater, but it is possible that these respondents may not have included the reverse cycle air conditioner when asked the number of air conditioners the household uses.

9 Data were collected on the location of air conditioners used most often in households. A majority of respondents who stated that the type of heating used most often was a reverse cycle air conditioner also stated that this was the only air conditioner used or, if they had more than one air conditioner, it was the air conditioner they used most often. A small proportion of respondents (representing 0.5% of the household population) reported that the air conditioner used most often was an air conditioner other than the reverse cycle air conditioner used as the main type of heating. These respondents were asked the location of the air conditioner used most often and were not asked the location of the reverse cycle air conditioner used as the main type of heating. Therefore, in the tables on the main type of heater (tables 3.5 and 3.6), the data on total reverse cycle air conditioners include reverse cycle air conditioners where the location is not known by the ABS.

EFFECTS OF ROUNDING

10 Estimates in this publication have been rounded and discrepancies may occur between sums of the component items and totals.

ACKNOWLEDGMENT

11 ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated. Without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence as required by the *Census and Statistics Act, 1905*.

RELATED PUBLICATIONS

12 The ABS produces a wide range of publications concerning social and environmental statistics. Users may wish to refer to the following ABS publications which relate to the survey topic:

Domestic Water Use, New South Wales, October 2002, cat. no. 4616.1
Domestic Water Use, Western Australia, October 2003, cat. no. 4616.5.55.001
Environment by Numbers: Selected Articles on Australia's Environment, 2003, cat. no. 4617.0
Environmental Issues: People's Views and Practices, Australia, 1992 to 2004 issues, cat. no. 4602.0
Water Account, Australia, 2000–01, cat. no. 4610.0

13 Current publications and other products released by the ABS are listed in the *Catalogue of Publications and Products* (cat. no. 1101.0). The Catalogue is available from any ABS office or the ABS web site <http://www.abs.gov.au>. The ABS also updates daily a Release Advice on the web site which details products to be released in the week ahead.

APPENDIX

ADDITIONAL DATA AVAILABLE

ADDITIONAL DATA AVAILABLE

In addition to the statistics provided in this publication, the ABS can produce customised tabulations on request. Subject to confidentiality and sampling variability constraints, tabulations can be produced from the survey by cross-classifying any of the following data items for the relevant survey populations.

POPULATIONS

All households

Households connected to gas

Households using a heater

Households with a hot water system

Households with a rainwater tank plumbed into dwelling

Households with a front loading automatic washing machine

Households with a top loading automatic washing machine

Households with an air conditioner

Households with a garden and/or lawn

Households with reduced flow shower heads

DATA ITEMS

Dwelling characteristics

Area of usual residence
- Adelaide
- Balance of SA

Tenure type
- Owner with a mortgage
- Owner without a mortgage
- Renter – government housing authority
- Renter – other
- Other

Household characteristics

Household size
- One person household
- Two person household
- Three person household
- Four person household
- Five or more person household

Equivalised gross household income quintile
- Lowest quintile
- Second quintile
- Third quintile
- Fourth quintile
- Highest quintile

Whether children in the household
- With children (at least one household resident aged 0–14 years)
- Without children (no household resident aged 0–14 years)

Water use

Whether household had a rainwater tank plumbed into dwelling

Whether household had a reduced flow shower head

Type of washing machine
- Top loading automatic
- Front loading automatic

Whether household had any gardens or lawns
- Lawn only
- Garden only
- Both lawn and garden
- Neither lawn nor garden

Methods of watering gardens/lawns
- Hand watering
- Movable sprinkler
- Fixed sprinkler system including drip systems
- Timer
- Other
- Did not water/relied on rainfall

Water conservation actions taken around the dwelling in the last 12 months
- Stopped watering or did not water the lawn
- Watered using a soaking method
- Planted drought tolerant plants or lawn
- Used mulch
- Removed or reduced the size of the lawn
- Recycled or reused water
- Adjusted water level when washing clothes or dishes
- Taken less time in the shower

Water conservation actions taken around the dwelling for the first time in the last 12 months
- Stopped watering or did not water the lawn
- Watered using a soaking method
- Planted drought tolerant plants or lawn
- Used mulch
- Recycled or reused water
- Adjusted water level when washing clothes or dishes

Energy use

Gas connection
- Mains
- Bottled
- Both mains and bottled

Energy source for hot water system
- Peak electricity
- Off-peak electricity
- Gas
- Solar
- Wood
- Other

Energy use continued

Main type of heater
- Portable electric
- Electric ceiling, wall or floor radiant heating
- Off-peak electric in slab heater
- Off-peak electric heat bank
- Other electric
- Reverse cycle split system air conditioner
- Reverse cycle air conditioner set in wall or window
- Ducted reverse cycle air conditioner
- Reverse cycle air conditioner in unknown location
- Flueless gas heater
- Floor/wall mounted gas space heater
- Ducted gas heater
- Other gas heater
- Open wood fire
- Pot belly or slow combustion wood heater
- Oil fired heater
- Other heater
- No type of heating used

Whether household had an air conditioner

Number of air conditioners used
- None
- One
- Two
- Three or more

Whether household mainly used an evaporative air conditioner

Location of mainly used air conditioner
- Split
- Set in wall/window
- Ducted
- Portable

FURTHER INFORMATION

For further information about additional data available on request, please contact Stuart Peevor on Adelaide (08) 8237 7572.

DATA QUALITY

ESTIMATION PROCEDURE

1 Estimates derived from this survey were obtained by adjusting the MPS selection weights to account for the slightly lower sample size for this survey. The weights were then adjusted to ensure that the survey estimates conformed to an independently estimated distribution of the population (by number of adults and children within the household, and by part of state) rather than the distribution among respondents.

2 The estimates were then obtained by summing the weights of households within the required group. For example, an estimate of the total number of households with a top loading automatic washing machine is obtained by adding together the weight for each household in the sample with a top loading automatic washing machine.

RELIABILITY OF ESTIMATES

3 Estimates in this publication are subject to non-sampling and sampling errors.

Non-sampling errors

4 Non-sampling errors may arise as a result of errors in the reporting, recording or processing of the data and can occur even if there is a complete enumeration of the population. Non-sampling errors can be introduced through inadequacies in the questionnaire, non-response, inaccurate reporting by respondents, errors in the application of survey procedures, incorrect recording of answers, and errors in data entry and processing.

5 It is difficult to measure the size of the non-sampling errors and the extent of these errors could vary considerably from survey to survey and from question to question. Every effort was made in the design of this survey and in the development of survey procedures to minimise the effect of these errors.

Sampling errors

6 Sampling error is the difference between the published estimate, calculated from a sample of dwellings, and the value that would have been produced if all dwellings had been included in the survey.

7 One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate may vary from the true value. There are about two chances in three (67%) that a survey estimate is within one SE of the figure that would have been obtained if all households had been included in the survey, and about 19 chances in 20 (95%) that the estimate lies within two SEs.

8 Due to space limitations, it is impractical to print the SE of each estimate in the publication. Instead, a table of SEs is provided to enable readers to determine the SE for an estimate based on the size of that estimate (see table T1). The SE table is derived from a mathematical model, which is created using the data collected in the survey. The figures in the SE table will not give a precise measure of the SE for a particular estimate but will provide an indication of its magnitude.

Sampling errors continued

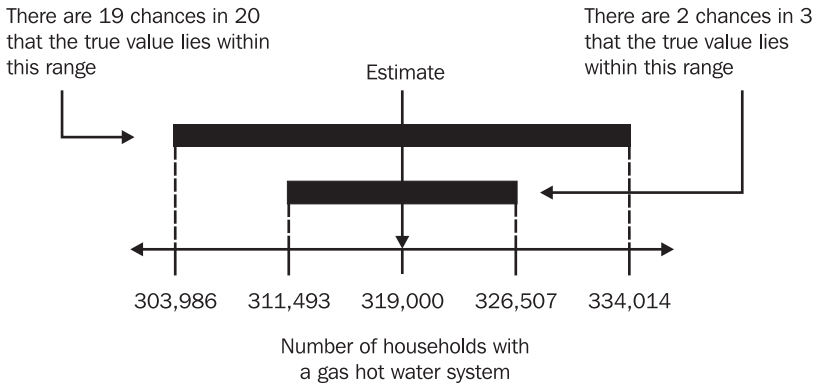
9 Linear interpolation can be used to calculate the SE of estimates falling between the sizes of estimates presented in table T1, using the following general formula:

$$SE\ of\ estimate = lower\ SE + \left[\left(\frac{upper\ SE - lower\ SE}{upper\ est - lower\ est}\right) \times (est - lower\ est)\right]$$

10 An example of the calculation and use of SEs is as follows. Tables 3.13 and 3.14 show that the estimated number of households in SA that had a gas hot water system was 319,000. Since this estimate is between 300,000 and 500,000, table T1 shows that the SE will lie between 7,350 and 9,000. The approximate value of the SE can be interpolated as follows:

$$SE\ of\ estimate = 7,350 + \left[\left(\frac{9,000 - 7,350}{500,000 - 300,000}\right) \times (319,000 - 300,000)\right] = 7,507$$

11 Therefore, there are about two chances in three that the true number of households in SA that had a gas hot water system lies between 311,493 and 326,507 and there are about 19 chances in 20 that the value lies between 303,986 and 334,014. This example is illustrated in the diagram below:



12 The SE can also be expressed as a percentage of the estimate, known as the relative standard error (RSE). The RSE is calculated by dividing the SE of an estimate by the estimate, and expressing it as a percentage. That is:

$$RSE = \frac{SE}{estimate} \times 100$$

13 For example, the RSE for the number of households that had a gas hot water system is:

$$RSE = \frac{7,507}{319,000} \times 100 = 2.4\%$$

14 The RSE is a useful measure in that it provides an immediate indication of the level of error likely to have occurred due to sampling.

15 In general, the size of the SE increases as the size of the estimate increases. Conversely, the RSE decreases as the size of the estimate increases. Very small estimates are thus subject to high RSEs and are considered too unreliable for general use.

16 Only estimates with an RSE of less than 25%, and percentages based on such estimates, are considered sufficiently reliable for most purposes. Estimates with RSEs greater than or equal to 25% have been included in this publication, however, they are preceded by a single asterisk when the RSE is 25% to 50% (e.g. *3.3) and by a double asterisk when the RSE is greater than 50% (e.g. **0.6). A single asterisk indicates that the estimate is subject to high sampling error and should be used with caution. A double asterisk indicates that the estimate is considered too unreliable for general use.

Sampling errors continued

17 Published estimates are sometimes used to calculate the difference between two survey estimates. Such an estimate is also subject to sampling error. The sampling error of the difference between two estimates depends on the SE of each estimate and the relationship (correlation) between them. The approximate SE of the difference between two estimates (x and y) may be calculated using the following formula:

$$SE\,(x-y) \;=\; \sqrt{[SE(x)]^2 \;+\; [SE(y)]^2}$$

18 While this formula will only be exact for differences between separate and uncorrelated characteristics or subpopulations, it is expected to provide a good approximation for all differences likely to be of interest in this publication.

19 For example, table 3.12 shows that an estimated 56,200 households in the lowest quintile of gross equivalised household income and 66,700 households in the highest quintile of gross equivalised household income had mains gas connected to their dwellings. This equates to a difference of 10,500 households. The standard error for each estimate is calculated using linear interpolation (as described above) and then the standard error on the estimate of the difference is calculated as:

$$SE[x-y] = \sqrt{\left[SE(3,505)^2\right] + \left[SE(3,768)^2\right]} = 5,146$$

T1 STANDARD ERRORS OF ESTIMATES OF SA HOUSEHOLDS

Size of estimate	*SE*	*RSE*
no.	no.	%
500	290	58.2
700	360	50.8
1 000	440	43.9
1 500	550	36.9
2 000	650	32.6
2 500	750	29.5
3 000	800	27.2
3 500	900	25.4
4 000	950	23.9
5 000	1 100	21.5
7 000	1 300	18.3
10 000	1 550	15.4
15 000	1 900	12.6
20 000	2 200	10.9
30 000	2 650	8.9
40 000	3 050	7.6
50 000	3 350	6.7
100 000	4 600	4.6
150 000	5 500	3.7
200 000	6 200	3.1
300 000	7 350	2.4
500 000	9 000	1.8
1 000 000	11 650	1.2

20 Therefore, there are about two chances in three that the true difference between the number of households in the lowest and the highest quintiles of gross equivalised household income that had mains gas connected to their dwellings lies between 5,354 and 15,646, and there are about 19 chances in 20 that the value lies between 208 and 20,792.

GLOSSARY

Adjusted water level when washing clothes or dishes	Includes adjusting water levels on washing machines to suit the amount of washing to be done and the use of washing machines that automatically measure the size of the load and adjust the water levels accordingly.
Air conditioner	An apparatus for controlling the temperature of an enclosed space. It can be portable or fixed into the structure of the dwelling, usually in the wall or ceiling.
Area of usual residence	A person's area of usual residence as classified by the Statistical Region structure in the Australian Standard Geographical Classification (ASGC). Data are available on request for a classification which divides SA into two Major Statistical Regions – the Adelaide Statistical Division and the Balance of SA. For further information on the ASGC refer to *Australian Standard Geographical Classification* (cat. no. 1216.0).
Around the dwelling	Around the dwelling refers to areas or property the household owns or is responsible for, e.g. gardens and lawns, as opposed to public property like footpaths or parks.
Bottled gas	Gas provided in a large bottle or canister which is located near the house. A gas retailer may remove empty canisters and replace them with new ones.
Ducted air conditioner	A ducted air conditioner is one where air is piped through the dwelling to more than one outlet from a single source.
Electric ceiling, wall or floor radiant heating	Wall or floor radiant heating is provided by panels that are mounted to the wall/floor. These radiate heat into the room without the assistance of a fan. Ceiling radiant heating is provided by heating elements that are inserted between the ceiling material and any insulation. These elements radiate heat through the ceiling into the room below. The addition of insulation on top of the elements prevents the radiated heat escaping through the roof.
Electric off-peak heat bank	An off-peak heat bank operates along the same principle as in slab heating. A heating grid is contained in a large mass of concrete which acts as a thermal mass. This can be heated overnight using off-peak electricity and the heat is released during the day. The main difference between in slab and heat banks is that heat banks are usually used as space heaters to heat individual rooms, whereas in slab heating tends to heat large portions, if not all, of a house.
Electric off-peak in slab heater	In slab heating is usually installed when a house is built. Before pouring the slab, a heating grid is laid in the 'slab area' and the concrete for the slab poured over and around it – literally 'in slab heating'. The heating grid heats the concrete of the slab which then radiates it to the rooms of the house. An advantage of in slab heating is that the concrete slab acts as a 'thermal mass' storing the heat and releasing it slowly. This means that off-peak electricity can be used to heat the slab overnight and this heat is released during the day. This form of heating is commonly found in colder Australian climates but is becoming more common in South Australia.

Equivalised gross household income

Gross household income that has been adjusted using an equivalence scale. For a lone person household it is equal to gross household income. For a household comprising more than one person, it is an indicator of the gross household income that would need to be received by a lone person household to enjoy the same level of economic well-being as the household in question. The scale allocates 1.0 point for the first adult (aged 15 years and over) in a household; 0.5 for each additional adult; and 0.3 for each child (aged less than 15 years). Equivalised household income is calculated by dividing total household income by the sum of the equivalence points allocated to household members.

Equivalised gross household income quintile

These are groupings of 20% of the households when ranked in ascending order according to equivalised gross household income. The quintile boundaries of the equivalised gross household income for the 2004 Domestic Use of Water and Energy Survey, SA, household population were:

- Lowest quintile: Less than $240 per week
- Second quintile: $240 to 365 per week
- Third quintile: $366 to $567 per week
- Fourth quintile: $568 to $860 per week
- Highest quintile: $861 or more per week.

Households in the 'Not known or not stated' category include those containing at least one person for whom income was not known by the respondents.

Evaporative air conditioner

An air conditioner that draws outdoor air through a water filtration system whereby some heat from the air is absorbed through water evaporation. The cooled air is then redirected indoors. An evaporative air conditioner contains water within the system to cool the air circulating through it. It has a cooling fan that draws air through moistened pads. The air is cooled and filtered as it passes through these pads.

Fixed sprinkler system

A grid of sprinklers that has been installed to provide complete coverage of an area without any need to remove the sprinklers.

Front loading automatic washing machine

An automatic washing machine that opens and is loaded from the front. The user is able to set the machine and the machine then proceeds with washing and spinning without the intervention of the user.

Gardens or lawns

Private gardens or lawns attached to a dwelling. A garden refers to any outside garden of any size which contains any number of living plants and may include ferneries, flower beds, greenhouses etc. which are outside the house. Excludes pot plants on a balcony or in a courtyard, e.g. in a unit, and atriums within the dwelling.

Gas ducted heater

Ducted systems consist of heat piped through the dwelling to more than one outlet from a single heat source (e.g. a gas furnace).

Gas heater

Includes heaters that use gas for heating, but need electricity to ignite or start the appliance.

Government housing authority

Government housing authorities in South Australia are the Aboriginal Housing Authority, the South Australian Community Housing Authority and the South Australian Housing Trust.

Hand watering

Includes using a hose or buckets.

Hot water system

A device used for heating water in a dwelling. The energy source for heating is generally solar, gas or electricity, although some systems use other sources (e.g. wood combustion). Hot water systems are usually instantaneous or storage/tank systems. An instantaneous hot water system heats water instantly as it flows through the system, whereas a storage/tank hot water system heats water and stores it in a tank until it is needed.

Household	A group of residents of a dwelling who share common facilities and meals or who consider themselves to be a household. It is possible for a dwelling to contain more than one household, for example, where regular provision is made for groups to take meals separately and where persons consider their households to be separate.
Household income	Income from all members of the household including profit or loss from members' unincorporated business or share in a partnership, profit or loss from rental property, dividends or interest, wages or salary, government pensions or allowances, Family Tax Benefit A or B if received as a payment from Centrelink, child support or maintenance, superannuation or annuity and regular income (where at least one payment a year is received).
Mains gas	Gas connected to the household by underground pipes and provided on a continuous basis (never runs out).
Mulch	Material that is put on the surface of the soil in gardens in order to reduce water evaporation and weed growth. Examples of types of mulch include grass clippings, wood and bark chips, straw, lucerne, hay, newspaper, compost and stones. Excludes manure and fertilisers which, if used in sufficient quantities to act as a mulch, would kill plants.
Number of air conditioners	Ducted air conditioning systems, and air conditioning systems with more than one outlet are counted as one air conditioner.
Off-peak electricity	Supply of electricity at periods of time of less activity than at peak times. Hot water systems that use off-peak electricity are set to operate only during an off-peak period, normally during the night.
Petajoule	One thousand million million (1,000,000,000,000,000) joules.
Planted drought tolerant plants or lawn	Includes any drought tolerant plants which have been planted by members of the household and excludes trees or shrubs that were planted by previous residents.
Portable air conditioner	A portable air conditioner is one which may be moved around the dwelling.
Portable electric heaters	Includes oil column heaters which, although they are filled with oil, are powered by electricity.
Rainwater tank plumbed into the dwelling	A tank used to store rainwater that is connected with pipes to a tap, washing machine or toilet inside the dwelling.
Recycled or re-used water	Sometimes known as 'grey water' or 'dirty water', covers a broad range of practices undertaken by households to re-use water (after it has been used once, and that would normally go down the drain but is used for another purpose) from in and around the house. Examples include using sophisticated recycled water systems, collecting water from running a shower or bath, using suds saver on washing machine, and pouring leftover water from water bottles and vases onto gardens/lawns.
Reduced flow shower head	A water saving device that restricts water flow through shower heads. Sometimes referred to as a low flow shower head. A low or reduced flow shower head is specially designed to deliver a limited rate of flow of water with a pressure comparable to normal shower heads.
Reverse cycle air conditioner	A reverse cycle air conditioner may also be used as a heater. The temperature is able to be varied between warm and cool settings.
Soaking method	Watering gardens and lawns less frequently but for longer periods.
Solar hot water system	Includes solar hot water systems that have boosters to heat water during periods of rain or overcast conditions, and when heavy demand exhausts the hot water supply before it can be reheated by the sun.
Split system	A split system air conditioner is separated (but still connected by pipes or ducts) into a main unit that houses the compressor, and one or more outlets. The main unit is usually located outside the dwelling.

Sprinkler	A portable watering device that attaches to the end of a hose and sprays water.
Stop watering the lawn	Includes deciding to let the lawn 'brown off'. Excludes not watering the lawn during the winter or wet weather when the household is planning to resume watering when the weather becomes hotter and/or drier.
Tenure type	Describes the legal right a person has to occupy a dwelling (e.g. owned without a mortgage, owned with a mortgage, rented). Other tenure type includes house-sitting, payment in kind for a specific service, life tenure scheme, and participant of rent/buy (or shared equity) scheme.
Timer	Includes manual and electric timers which allow users to set the amount of watering time.
Top loading automatic washing machine	An automatic washing machine that opens and is loaded from the top. The user is able to set the machine and the machine then proceeds with washing and spinning without the intervention of the user.
Usual residents	Persons who usually live in a particular private dwelling and regard it as their own or main home. Excludes usual residents who were away from the dwelling for more than six weeks altogether and visitors to the dwelling who do not usually live there, do not regard it as their own or main home, but are temporarily staying there.

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